INTERVIEWS

A-1. Transcript of IE TMI Investigation Interview of Harold Hartman, 5/22/79

A-2. Report of NRC TMI Special Inquiry Group Interview of Harold Hartman, 9/12/79

A-3. Transcript of NRC TMI Special Inquiry Group Interview of Harold Hartman, 10/29/79

A-4. Partial Transcript of What's Happening America Interview of Harold Hartman, 3/24/80

A-5. Transcript of Hartman Allegations Investigation Team Interview of Harold Hartman, 3/26/80

A-6. Signed Statement of Harold Hartman before Hartman Allegations Investigation Team, 3/26/80

A-7. Transcript of Hartman Allegations Investigation Team Interview of Brian Mehler, 3/27/80

A-8. Transcript of Hartman Allegations Investigation Team Interview of Jim Floyd, 3/27/80

A-9. Transcript of Hartman Allegations Investigation Team Interview of Kenneth Hoyt, 3/27/80

A-10. Transcript of Hartman Allegations Investigation Team Interview of Bernie Smith, 3/27/80

A-11. Results of CRO Screening by Hartman Allegations Investigation Team, 3/27-31/80

A-12. Report of Hartman Allegations Investigation Team Interview of Hugh McGovern, including 4/10/80 sworn statement and 12/24/78 Reactor Coolant Leakage Test Record

A-13. Report of Hartman Allegations Investigation Team Interview of Earl Hemmila, including 4/10/80 sworn statement and 3/21/79 Reactor Coolant Leakage Test Record

A-14. Report of Hartman Allegations Investigation Team Interview of Mark Coleman, including 4/10/80 unsigned statement

A-15. Report of Hartman Allegations Investigation Team Interview of Joseph Congdon, 4/10/80

A-16. Report of Hartman Allegations Investigation Team Interview of John Blessing, 4/10/80

A-17. Report of Hartman Allegations Investigation Team Interview of Marty Cooper, 4/10/80

A-18. Report of Hartman Allegations Investigation Team Interview of Raymond Bocher, 4/10/80

19. Notes of Hartman Allegations Investigation Team initial contact with Harold Hartman, 3/22/80.

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of:

IE TMI INVESTIGATION INTERVIEW

of

Ex-Control Room Operator (CRO)

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

May 22, 1979
(Date of Interview)

July 3, 1979
(Date Transcript Typed)

254, 255
(Tape Number(s))

NRC PERSONNEL:

Mr. James S. Creswell
Mr. Anthony N. Fasano
Mr. Robert Marsh

MARSH: The date is May 22, 1979. The time is 6:49 p.m. This is Bob Marsh, MARSH, and I'm and investigator with the U.S. Nuclear Regulatory Commission assigned t Region III, Chicago, Illinois. This evening we are located in Room 119, the Red Roof Inn, in Swatara, Pennsylvania. That's SWATARA, and we are here to conduct an interview of CRO , who is an ex-CRO for Met-Ed at the Three Mile Island site. At this time I'd like the other individuals in the room to identify themselves, to spell their last name, and to identify their position.

CRESWELL: This is James S. Creswell, CRESWELL. I'm a reactor inspector located at Region III.

FASANO: I am Anthony N. Fasano, FASANO. I am an Inspection Specialist out of Region I.

CRESWELL: I'd like to make a reference to CRO first name being CRO .

MARSH: Thank you. CRO you indicated that you go by CRO even though your name is CRO right.

CRO : Right.

MARSH: CRO, before we turn the tape on we had sat here and discussed this two paged memo and I just want to make a few items in there a

matter of the taped record. As I indicated the memo does cover the purpose and scope of our investigation and goes to some degree into the rights of the individual being interviewed. On the last page there's several questions which I just would like to get your response to on the tape and that is (1) do you understand the above which addresses the two page memo?

CRO: Yes.

MARSH: The second question reads, do we have your permission to tape this interview?

CRO: Yes.

MARSH: And thirdly, it says do you want a copy of the tape?

CRO: Yes.

MARSH: Fine. On the tape I will get you a copy of this tape probably tomorrow and I will get a copy of the transcript when its available mailed out to you so you have that also. There's a fourth question covered in the body of the text that does not pertain specifically to you, but it addresses the individuals rights. We can abide by it if you so want, and that indicates that for the Met-Ed employees in that if they so desire, they could have a union representative or a Met-Ed

representative present. I think you've indicated that you did not, but can I get your response now?

CRO: I waive my right have any...

MARSH: Fine. Thank you. CRO, to get going with, we'd appreciate it very much if you could give us some words regarding your background, you association with the nuclear field, and your experiences with Met-Ed. I'd also like to include the dates that you went to work for Met-Ed and the date that you separated.

CRO: I started my nuclear career in the United States Navy. I went to basic nuclear power school in Bainbridge, Maryland. I graduated in the top quarter of my class there. I went to West Milton S3G prototype in West Milton, New York. I was then transferred to the Woodrow Wilson. I served aboard her 2 1/2 years. I was transferred to the U.S.S. T_____ who was in overhaul in Pearl Harbor Naval Ship Yard. I was separated from the navy in November '73. I started work with Met-Ed, January of 1974. I believe it was the 28th. I was hired there as an auxiliary operator. I went through six months of technical training on the operations, systems, and technical training, some reactor theory about Babcock and Wilcox reactor plants. I spent 2 1/2 years as an auxiliary operator and was promoted to Unit 2 control room operator in September of 1976. I attended the 8 week cold licensing program at Lynchburg, Virginia, the simulator training. I graduated

there No. 1 out of 6 and in October of 1977 I passed the requirements for a Nuclear Regulatory Commission operators license. From October of '77 until April 13 I served in the capacity as a licensed control room operator in Unit 2 and I resigned my employment as of April 13, 1978, 1979. And that's about it.

CRESWELL: CRO, I wonder if you could go back to the time of March 28, 1979 and tell us briefly when you got on shift and what went on as you got on shift.

CRO: This is gonna be amusing because I was in Lynchburg, Virginia at the one week reactor operation training course down there. So I was in Lynchburg on the morning of the 28th. I guess, well I woke up about 7:00 that morning and my shift foreman came over and said that his girl said Unit 2's down. The safety's were blowing for a couple of hours. I thought that was rather odd since they should never blow that long. And through the course of the day we just gathered bits and pieces of information as it went by, as they became available to us down there. Mostly from B&W people. In fact, we had a shift supervisor, Bernie Smith, he was there with us at the time my supervisor of operations in Unit 2, Jim Floyd was there, at the time and I guess later in the day when they figured things weren't so hectic, they called up and got a little bit more technical information as to what happened. And the way I understood it at that time was that they had a reactor...a loss of feedwater to both steam generators...and for

some reason they didn't have auxiliary feed. Now we didn't know the real reasons why they didn't have auxiliary feed when the pumps failed to start, or we didn't really know. So the rest of the day was then just spent simulating the accident, trying to see exactly what happened. We had several parameters that we knew happened, the pressure excursion in the primary system. They assumed that they had maybe one tube, had ruptured, it separated in the tube sheet on the B steam generator, because that's where the activity came from, that they knew was released at that time. We just, basically then, well, Jim Floyd and Bernie Smith, they left Thursday in the afternoon. They took a plane out and came back to the site and they left myself and the two other operators and the shift foreman down there just to continue with the training. And really the only information we got back then was either from the news papers, the television, or what we could get from Babcock and Wilcox and they didn't want to admit too much. Especially about fuel damage and any design deficiencies that may have been present or have thought may have been a cause of the accident. I got back from Lynchburg on Friday and I didn't really find too much out then. But I did hand in my resignation that day, it was the 31st of March. Or the 30th of March, excuse me, it was a Friday. And I went in to work then the next Wednesday and basically the accident was over. They were still in a state of general emergency according to the radiation, emergency plans. And my duties there were, I was only there for three days from the time the accident happened until I resigned. The three days that I spent there were basically a data taker, a log keeper, and such as that. I didn't really get into the operation of the plant.

CRESWELL: Okay, CRO. Who was your shift foreman that was with you up there on the...

CRO: It was Dick Hoyt.

CRESWELL: Dick Hoyt?

CRO: Dick Hoyt is my shift foreman, yes.

CRESWELL: Do you recollect who the other CROs were there?

CRO: Yeah. Ray Boyer and he's a licensed CRO, and John Blessing, he is a trainee.

CRESWELL: Now you, if I recollect properly, learned of the event through your shift foreman...

CRO: Yes, who had learned through a phone call from his girlfriend.

CRESWELL: His girlfriend where was she located?

CRO: Well, I didn't really get that personal with Dick, but to the best of my recollection he was dating a guard. It was a Gregg guard. Or...

CRESWELL: Gregg's Security?

CRO: Gregg Security. And I'm not sure if she was on that evening or what. Her information may have been second hand, I don't know.

MARSH: I think that was the point as to whether she just lived in the area or...

CRO: Yeah. She lived in Mount Gretna. As best as I can remember she lived in Mount Gretna which is a small mount community about 10 miles from the site, I believe.

MARSH: But also employed in and around the site, right.

CRO: Yes.

CRESWELL: Okay. Now basically at that point in time was, is it a fair characterization that the information was restricted to the relief, the safety relief valves blowing for a substantial period of time?

CRO: Yeah. At that time when she said that the safeties had blown for two hours and it raised a question in my mind that the safties, they couldn't have blown for two hours unless something was really wrong. The reactor would have had to stay at power in order for those things to blow.

CRESWELL: Okay.

CRO: So there's no two ways about it.

CRESWELL: So you...

CRO: So I assumed that they were the atmospheric relief valves. Now I, the atmospheric dump valves, yeah. I really didn't know the circumstances which opened. I knew how they could open, but I really didn't know the specifics on why they opened on the morning of the 28th.

CRESWELL: Okay. What happens after, are you at breakfast eating when you found this out or...

CRO: No. We just got, we were in the motel room.

CRESWELL: Oh, you were in the motel room.

CRO: Um um.

CRESWELL: Okay. So then what do you do? You go on into work...

CRO: Yeah. We went in, we went right into the training center there.

CRESWELL: On Old Forest Road. Does Jim Floyd try to get in touch with the plant or anything at that point in time?

CRD I really can't remember. I know, I think he did. But the information, yeah, as a matter of fact he did. He called up and he got, he was really interested in finding out some of the parameters, some of the things, some of the events, the sequences of the event, some of the readings that they were getting on the radiation monitors, and some primary and secondary chemistry analyses so that we could simulate it, so that we could see if we could simulate it, see some of the transients that took place. They had said that the pressurizer went solid. They said that the primary system pressure went up above the safety limit. At the time we didn't know that the pressurizer relief valve, electromatic, I guess it was, it was stuck. I don't even know at this time, to this date. I just assume that it was the electromatic relief valve. We didn't know that until I think it was Thursday morning we finally simulated that the valve actually failed opened.

FASANO: This is Fasano speaking. CRD you did mention that, in the conversation and the information that came to you on the first day, that you knew that the aux feed was not feeding. Were you told that over the phone?

CRO Yeah. They had said that the auxiliary feed, they didn't get it into the generators at the initial point. We didn't at that time, we didn't know how the feed was stopped. We didn't know whether it was a malfunction of the pumps, the piping, or valves. We really know what the cause was.

FASANO: Do you know what valves they were talking about?

CRO: Absolutely. I checked those every time I come on shift.

FASANO: Why?

CRO: They're important. And 1 is they're always doing surveillance. They do a monthly surveillance on each one of those three pumps when we're at power. In fact, they have to do a once a month in mode 4 or above and I know that those two valves had to be shut in order to do the surveillance so that they didn't feed the water through the air operated regulating valves into the generators.

CRESWELL: This is Jim Creswell again. Have you ever found those valves closed before?

CRO: Yes.

CRESWELL: How many times?

CRO: Once, that I can remember.

CRESWELL: Why was it, why were they closed?

CRO: I can't recall why they were closed. I asked my foreman, when I found them closed, I asked my foreman if this was a general procedure that I follow, I asked him do you know why the ESV 12 valves are shut. He said no, I don't. I said okay, Dick, I'm gonna open them, and then I opened them and everything lets loose.

CRESWELL: The foreman's name is...

CRO: Dick Hoyt.

CRESWELL: Dick Hoyt. Do your recollect when this happened?

CRO: There were so many things that, there were so many things to recollect, I really can't even put a time frame on it. I really don't know.

CRESWELL: Would it be like weeks before the event?

CRO Yes. It would have been weeks. Maybe, perhaps months.

CRESWELL: Okay.

CRO: Several months.

CRESWELL: Okay. But as far as you know it, there's not a practice of leaving those valves closed for a specific reason? You know of no reason?

CRO: No. None whatsoever except that the surveillance procedure calls for them to be shut when the actual test is being conducted.

CRESWELL: Do you know if that was reported to the NRC that those valves were shut?

CRO: No, I do not.

CRESWELL: Do you know if the unit was operating at power when that happened?

CRO: I can't recall that either.

CRESWELL: Okay.

CRO: But it doesn't make any difference, in Mode 4 they're required.

CRESWELL: Okay. Getting back to the sequence of the event, the time sequence of that day, you went on into the B&W facility on Old Forest Road in Lynchburg and you started simulating the event on the simulator and I guess all of you were in the simulator at that...

CRO: Well, it was, they kind of pushed us aside, really. And every once in a while if we get a break, we had some classroom training when they were running this and the three CRO's, in fact, it was the three CRO's, well myself, and two other guys, and Dick Hoyt, the foreman. We spent most of the morning in class while they ran the tests...

CRESWELL: When you say they...

CRO: Jim Floyd, Bernie Smith, there was one or two other instructors, I know then later there was some of the big wheels down there from B&W that were on the test site, I don't know their names. But I guess they conducted tests from like 10:00 in the morning when they got the information that they needed until probably 2:00 in the afternoon.

CRESWELL: Okay. What basically was the information that they were using when they started at 10:00 in the morning? Did you run down through it?

CRO: Loss of both feed pumps caused by low suction pressure and that caused a high pressure reactor trip and they said that 8 minutes later they got emergency feed. So that's when we simulated turning on the emergency feed pumps. It was 8 minutes into the accident. We also simulated, we also assumed, we didn't get this I don't believe we got this from any information that was sent down that morning, but we knew that the pressurizer was on continuous spray to equalize boron or to keep boron in the pressurizer and the RCS equalized.

CRESWELL: And that was the because of the leaking valves on the pressurizer?

CRO: The leaking pressurizer code safeties.

CRESWELL: The safety valves.

MARSH: Excuse me. Have you nodded in afirmation to that statment, right?

CRO: Yes, yes.

FASANO: CRO, you knew that the code safeties were leaking, I mean...

CRO: Absolutely. They were leaking, I know for at least 3 months before the accident.

FASANO: Now, my understanding the electromotive, the electromatic, was the main cause of leakage prior to the event. Now this is a little different so...

MARSH: Well, this is his understanding.

FASANO: I understand...I just wondered where he gets his information.

CRO: I can look at the computer. They have an analog value of the temperatures at the outlets of these valves.

FASANO: These would be the thermocouples?

CRO Right. The thermocouples downstream. The electromatic relief valve was the lowest of the three and it had been for 3 months. The other two would kind of weep up and down and they would sometimes maybe every once in a while you'd see them above 200 degrees, but most of the time they stayed between 150 and maybe 180 which before they started leaking they were always down around 100, 105. I know for a fact a leak rate is required every 3 days. That leak rate had to be fudged every time we got, just about everytime that we got it, we had to do something to make it right. We as control room operators on my shift, I know, we kept asking what are you gonna do about these valves. They're leaking. We can't get a leak rate out of the computer. We can hardly even do a hand calculation and have it come out right. We

don't have to maybe go look at something. It was just a bad situation. I didn't like it.

CRESWELL: Let me ask you this. Who did you inform?

CRO: This would be Dick Hoyt knew about it. I know Bernie Smith knew about it, and every other shift supervisor and shift foreman and control room operator that operated the plant in the previous 3 months had to know about it.

CRESWELL: Now you said that you felt that the figures were inaccurate. What other evidence did you have?

CRO: I mentioned that when we simulated the accident we simulated it down at the simulator with the spray valve open and the pressurizer heaters on. And the reason that I know that this, relief valves, were leaking was the fact that if you turned the spray valve off and put the spray system back in its automatic mode that you'd have a continuous rod motion in which indicated that the plant was deborating. When you turn the spray back on and recirculated the pressurizer, force that borated water that was in there back into the primary system the rods would move out.

CRESWELL: Okay,...

CRO: We fought that for 3 months. I hated it. Every minute of it.

CRESWELL: So this was a substantial boron change that you were getting in system.

CRO: Absolutely.

CRESWELL: Due to distillation in the pressurizer.

CRO: Right.

CRESWELL: Okay. So we should be able to look like at the power range charts or the rod positions. Probably rod positions.

CRO: This was during the early days. You know there's a lot of people up there, a lot of, I consider, top notch operators. But when sometimes it comes down to the basics of knowing what happens, you know, they really, they 'ook for the complicated picture a lot of times. They don't go back to the basics. I picked up how to operate this system right off the bat. You just put it in automatic and you leave it there. If something happens, ...or not in auto I mean you put it into manual...and you just let it continuously recirc that way you have no boron change to worry about except normal leakage, maybe you have to add some demin water for fuel burnout just to bring the

rods back in a little bit for control. A lot of the operators didn't understand that and they'd get themselves in trouble with all the rods out at 98% power or they get them down in too far so that you get close to the rod index curves and I don't know...

CRESWELL: Let me ask you this, CRO. Regarding the reactor coolant drain tank, the leakage from those valves could go into the reactor coolant drain tank.

CRO: That's correct.

CRESWELL: Now if there was excess leakage it would require frequent startup of the transfer pumps. Correct?

CRO: That's correct.

CRESWELL: Was that an operation that you customarily go through?

CRO: Since the relief valves were leaking I can remember, and there of late we had to pump it at least 4 times a shift.

CRESWELL: Okay.

CRO: And that was, I can't even remember the number. We pump it for about 5 minutes and it was probably 100 gallons per minute. So probably a total of 500 gallons each time.

CRESWELL: Or 2000 gallons per 8 hour shift?

CRO: Right. In fact, I took a backlook at the logs from the time that we started to have to add water into the makeup tank to keep RCS inventory. And at one time I can remember they would pump 3000 gallons of demin water a day. Now that is your information. You can get that right out of the control room operators log to verify that. I even, you know, they, the people that I had to report to didn't even understand the seriousness and I believe that that was a serious problem.

CRESWELL: In what way?

CRO: Control wise, because everybody had a different way of controlling. One time I would come in and the spray would be on automatic building up boron in the pressurizer. Pretty soon I'd end up with my rods at the index limit. Now, where's my boron in the RCS? I don't know. Now, what do I have to do to get the rods out? Well, I can only assume that the boron is in the pressurizer and manually spray. How long it was there, the only thing I can do is go back to the log. If the records were kept accurately, then I could make a pretty good judge of, you know, whether my rods were gonna go out the top or whether I was gonna have to add some demin water to keep them in.

CRESWELL: Well, let me ask you this, CRO. Could ask for a sample on the pressurizer and ask for a sample on letdown, would that help?

CRO: Yeah. I'm not sure how often those samples were taken. I know they were taken at some interval and I believe it was once a week. And I can remember at one time a sample came back and it was 100 and, well to the best of my knowledge, it was around 120. Difference between pressurizer boron...

CRESWELL: 120 ppm difference between the pressurizer and the reactor?

CRO: Right, between pressurizer and reactor. And if I remember correctly, that was with continuous spray. After a while we had gotten to the point where everybody was kind of operating the pressurizer spray system in a, I don't want to say it, a coordinated fashion, where everybody kind of did it the same that you could know where you were at, how to operate it.

CRESWELL: What brought about this consistency of operation?

CRO: Well, I did a lot of screaming.

CRESWELL: Do you have any indication that management beyond operations was informed or knew about this problem?

CRO: Oh, they had to. My supervisor, Bernie Smith, would, he would make a reminder to all the operators on our shift, the operator that had the panel, the console that day, hey, don't forget to spray

the pressure and don't forget to recirc the pressurizer for at least a couple of hours. And one of the operators, Ray Boyer, he always just liked to put it on recirc for a couple of hours and then take it off. And maybe he'd do that two times a shift and everytime he did it he would end up with rods out. And, you know, it wasn't really funny but then again you kind of had to laugh at the guy because he was ignorant. He didn't you know, I don't like to make any bones about the way a fellow operates but...

CRESWELL: Let me ask you this. Why wouldn't management have shut down and repaired those leaking valves?

CRO: My impression of Met-Ed management was number one, they put the reactor into commercial operation before it was ready. It was so obvious I could run down a list, and maybe I will later, I don't know. I'll run down a list of problems, design deficiencies, that really they should have never gone up with them. They should it even have, never have, attempted to up with them.

CRESWELL: Let's go into that list, let's go down.

CRO Right now? Okay.

CRESWELL: Just take you time and we'll give you plenty of time to think.

CRO: We started power operations back in, well I won't say power operations, maybe we did too, back about a year, almost a year before, back in March, I believe we made initial criticality. We did the low power physics testing and I believe we escalated to 15 or 20% power. No, I take that back. We got up to 40% when we had the safety valve problems. There was one of the biggest design deficiencies that cost them millions of dollars for that job. And to me it was just misdesign.

CRESWELL: That was when they replaced the Lonergan valves with the Dresser...

CRO: Dresser...

CRESWELL: Dresser valves.

CRO: Dresser valves. The condensate polishing system. It was a nightmare. They didn't have an automatic bypass. If you lost instrument air, all 8 discharge valves from the polisher vessels would fail closed. If that happens the booster pumps loses suction pressure, they trip, they cause the feed pumps to lose suction pressure and they trip. Seven vessels is normally all we were designed to operate with. Okay, you could operate with 8 but that's bad engineering practice. Seven vessels could hardly take the load at 98% power let along 100. The condensate reject valve which was located between the condensate booster pump suction and the polishers, if it would cycle because of a

high hotwell level, if we are...or a low hotwell level...if it would cycle open because of a low hotwell level, it would starve the booster pumps of water that they desperately needed to pump and a booster pump would trip on low suction pressure, taking a feed pump along with it. This really wasn't too evident until we got up to, to higher power levels, when two feed pumps were really required to supply all of the feed flow. Whenever the turbine bypass valves, I can't remember the numbers...23 A & B, 24 A & B I believe they are...whenever those valves open on a transient, say we had it in a trip, and the bypass valves would open...dump steam into the condenser ...hotwell level indication would fail low. It would also cause the controller that controls the normal and the emergency makeup valves to see a low level and those valves would fail open, or they would go open thinking that there was a low level. Now the operator at this time saw less than 10 inches in the hotwell and I don't know how many of the other operators realized this, but when I see less than 10 inches in the hotwell and I've got 3 pumps setting there sucking at 1,000 horsepower apiece, I am very concerned about that-equipment damage. So I would watch the hotwell level, it just would stay low. It was horrible. And I would watch the amps on the on the pump, and watch the discharge pressure. That way I could tell if the level was actually low then. That was, yeah. Other than I knew the indicator said less than 10, I can only believe my indication, but I also realized the necessity for condensate flow during a transient like this. So I was a little hesitant to cut the pumps off at that particular point.

CRESWELL: That was the indication you had of hotwell level was the absence... that the condensate pump won't run. Turn the pump off? If you lost the condensate flow, you would trip the main feed pump?

CRO: Trip the booster pumps on low suction pressure trips the feed pumps.

CRESWELL: So, you got a loss of feedwater event?

CRO: Right.

FASANO: How many of these did you have?

CRO I can remember for sure 2 times. I don't know the exact dates. It was during one of the many trips they had there. Well, I wasn't really on them but I was a bystander. I was on dayshift. I was probably on the lead shift or training shift or something when they had a trip and I ran up to the panel to see what I could do. Then I saw it. But then see, the next problem is with that, I mentioned that the normal and emergency makeup valves saw that low level. They would open and they would dump tons of water in the condensor. Now, the actual level is going high. Now, if it gets too high, vacuum pumps. You also use all that space that normally was vacuum, is now water, and any steam that you've got coming into the thing, it covers tubes, you can't condense the steam as well. So what happens? The vacuum, pow. You lose vaucum, atmospheric dump valves open!

CRESWELL: What about them?

CRO: If you got OSTG tube leaks, you're in bad shape.

CRESWELL: Have they operated properly, the atmospheric dumps?

CRO: The only time I ever remember those things operating, we had just gotten off shift at 3:00. At 3:30, the oncoming shift had a trip and they lost, I don't know how they lost vacuum. Maybe they lost circ water. I think it was one of the same type transients I just described with the emergency makeup. They just lost vacuum because of a high level in the hotwell and the atmospheric dump valves opened and just if there was anybody down in that room, they would have been PAR boiled, they totally wiped out the pressurizer heater cabinets with steam. Steam was noted to have escaped through the area where they are located. I guess that was called the M20 area. Through the piping holes in the concrete structure down over into the control building area and it went as high as the control room floor, back into the instrument shop. They had steam from the bellows rupturing on the discharge of that valve.

FASANO: Both bellows ruptured or one bellow?

CRO One that I can recall. I know that one bellows did rupture. I can't recall, I don't think the other one did, but they replaced it with one of the similar design to the other one.

FASANO: Okay. Other equipment problems?

CRO: Main steam line supports. Two years ago I can remember somebody coming up to me and saying I don't want to be around when they trip the turbine from 100% with the restraint system that they have on those pipes. You'll have steam, pipes and lagging everywhere if that turbine trips. I don't really know, I know we went up, we heated up so we did have saturated steam in those pipes before the restraints were put in. I believe those restraints were put in during the relief valve outage when we replaced all the relief valve, they redesigned the pipe hangers and snubber arrangement down there on those. (1) I'm not too hot on Burns and Rowe because they never designed a pressurized water reactor plant, they only ever designed boiling water reactors which is obvious because of the 5 foot concrete wall between the turbine building and the control room. I don't know. Did you ever notice that?

FASANO: There is a, okay, you're talking about where the fire door is between the turbine building and the...

CRO And the control building, yeah, where they are.

CRESWELL: I've often wondered about that wall that's, not the wall between those two buildings but if you'll notice there's a wall that comes down in that hallway where that door opens up and its separated from the floor by an inch to 2 inches.

CRO Yeah, I've seen that. I never really wondered why that was there but I just kind of chalked it up to the rest of the crazy things I saw.

CRESWELL: Okay. What about the engineered safety features equipment itself? The high pressure injection pumps, where there ever any problems with them?

CRO No. I can't really recall any problems with those. Unit 2's kind of lucked out. We hadn't burned any up. Unit 1 went through 4 of them, I guess, before they learned their lesson.

CRESWELL: I understand the suction switches, low suction switches have been taken off those pumps.

CRO That's correct. They used to have a 3 pound low suction pressure trip on them, I believe. I don't really remember too much that far back, but I knew that I didn't like that particular thing because a lot of times you would start the pump up and it would trip right away because of the low suction pressure. It also had a low discharge pressure. No, no it didn't. It just had a low discharge pressure alarm that I can remember. No, those pumps, everytime I've operated them I never really had any problems with them.

FASANO: Sounds like most of your design deficienies are concentrated on the balance of plant on the secondary side at least, were there any on the, I mean about, are there any more you that you have in mind? Can you continue on you list? And if indeed on the NSS side?

CRO Well, the whole nuclear steam supply system, in fact the whole plant was designed for a place down in New Jersey. So in order to accomodate fuel handling buildings they had to take and rotate the reactor building, the guts of the reactor building, the inside part, 90 degrees. So that you could go into the reactor building and look at the wall and you'd have another 150 foot of pipe running around the outer edge of the walls that should have never been there. It should have gone straight out but I can't help but think that because of trying to, having a plant on the drawing board 15 years ago for Forked River, New Jersey, and then just take and modifing those plans, bringing them to Three Mile Island and constructing a power plant of that complexity that things aren't going to be wrong. You know, there are definitely going to be design deficiencies. Somebody that designed the system, somebody else is gonna come along and change it to fit TMI. One thing that I have...that I never really had close contact with, I know that the auxiliary operators, just because they were out in the plant, they had a close contact with it, was the fact that they had extension controls that went through the wall and they had clutches that operated the valve behind a concrete wall for radiation. Those each limit, limiting type thing. And most of the time the valves

would never operate, so you'd have to go through these, back into the valve alley to operate the valve anyway and you had to spend anywhere from 2 to 3 times as much time in the valve alley, crawling over all these extension controls that were in your way that, you know, the poor guy would end up getting three times as much radiation than he should have.

CRESWELL: Is this a wide spread problem or an isolated problem?

CRO: This is wide spread. Especially at filter rooms, the makeup valve suction alley, the discharge alley and the 305 valve alley.

CRESWELL: Those are only high radiation areas during operation?

CRO: Yes. Now I'm not sure, I know the levels were creeping up there in the later days of power operation. I know they were climbing up there and there were still valves in there that had to be operated for surveillance procedures, valve lineups and the like. Filter rooms is the same way only the filter rooms, you can't get into them.

CRESWELL: Do you recollect a trip that occurred back in around November 3rd, November 4th of 1978, a loss of feedwater type of trip? This is where an instrument technician threw the wrong switch and in condensate polishing system, all feedwater was lost. Do you remember any of the details of that event?

MARSH: You were nodding in affirmation, were you not?

CRO: Yes, I was. I remembered. I'm trying to think. I have to reprogram myself, here. I have got to get back into that. I've been through two total loss of feedwaters.

CRESWELL: Here?

CRO: Yes. One was at zero power or very low power and the other one was at 20% power. And I really don't remember too many of the details. I do know that the switch that the guy threw was control power for all of the valves in the condensate polishing system that made them shut cutting off all condensate flow path.

CRESWELL: Do you remember any operators on shift discussing that with you, hearing anything about it?

CRO: Well, I remember, they had the LER that was circulating and they had a synopsis of the event that we read in. We had to sign and initial.

CRESWELL: Well, this particular event that I'm speaking of, I don't believe there was an LER generated.

CRO: I see.

CRESWELL: There was one November 7th that was a loss of one feed pump, but that was with the run back. Okay. At this point in time we're getting very close to the end of the tape, so we'll break right here and continue with a new tape.

MARSH: Time is 7:32. I'm gonna break at this point and turn the tape over.

MARSH: Resuming at this time, the time is 7:33.

CRESWELL: Okay. What about you training at Three Mile Island Unit 2, how's that been?

CRO: I hate to say this but I'm gonna have to. They train, my training I thought was very well done. They put us through a pretty comprehensive program, the 8 weeks at Lynchburg, plus we had lots of time to ourselves just constructing the plant when things weren't very busy. We could get out into the plant trace systems and alike. We went through a mock NRC test that was given by a General Physics, the walk around and the test and then we had the actual test. We had a lot of prelicensing training that I thought was a big help. Onshift we had several lectures. They weren't always done as planned but we did get in some training onshift. The guy would take a system and

give everybody on the shift a lecture about it. But the licensed operators that have come on since the cold licensing groups, since the initial group of operators that went up, those operators are trained to take an NRC examination. They are not trained to operate the plant. They have copies of NRC tests, the questions, you know. They're...

CRESWELL: CRO, let me ask you this. You stated that general physics conducted a dry run of the licensees. Do you find that the NRC exams are predictible, the way the test will be conducted?

CRO: Yeah. I think they are fairly well predictible. TMI has got an excellent record. I don't know the records of any of the other operating plants. But I do know that TMI's record is good. I don't think we've had but one failure and that was in Unit 1. We've had several senior operators that went up for a senior's license but did fail the senior part but got a reactor operators license. And, you know, I can just say that I feel that this operating record is indicative of knowing what to expect. They can build up on it. If they know that a certain examiner is going to come, they can dig out all his old tests, they can, we have old interviews that somebody might have snuck a little tape recorder in their pocket and taped the entire walk around and you can get the tape conversations of those. I've seen those flying around.

MARSH: Have you actually seen a tape or heard a tape before this was done, or just transcripts thereof?

CRO: I've just seen transcripts, no tapes. In fact, I don't even know of anybody at Three Mile Island making a tape.

CRESWELL: Do you know what the source of the tape was?

CRO: I do know this, I know that it was a Babcock and Wilcox reactor.

CRESWELL: Okay.

CRO: And it was a specific examiner. I can't even remember his name. No, I wouldn't even begin to attempt to remember his name. I don't remember.

CRESWELL: One interview, it was one interview that you had heard of?

CRO: I think there was one, one for sure, maybe two.

CRESWELL: Okay.

MARSH: Where would I look if I wanted to find a set of those? Who would be my best shot that I could talk to?

CRO: I threw all my old stuff away.

MARSH: You had had a set of them?

CRO: I had a set at one time.

CRESWELL: Did you receive those through your employment at Three Mile Island?

CRO: Yeah. I can't recall who I got them from. I can't remember if it was the training department, which I don't think it was. I think it was one of the other operators and he might have gotten it from training.

MARSH: Okay. If you have any additional recollections on those, I'd appreciate you get in touch with me. I'll give you a card and a phone number and all that where you can reach me.

CRO: Yes.

CRESWELL: You mentioned before you'd come on shift and found those twelve valves shut before. What about, have you done your lineup on your panel before and found other valve mislineups?

CRO: I came in one day, this is just an example of some of the things that I've had to come into. Met-Ed was always famous for performing an evolution 20 minutes before shift relief. Turning the plant over in total chaos. I hated to turn the plant over that way myself and I more than hated receiving a plant like that. I came in one day to relieve the shift that had had a trip and I can't recall the exact, what happened, but I know that there was an operator was trying to control pressurizer level with MUV 16B. Now that's a high pressure injection valve on the A loop. He was throttling this valve, pressurizer level would go up, he would close it, it would come back down again, and he would just keep doing this. And I asked him, "what are you doing?" He said, "I'm maintaining pressurizer level." I said, "what happened to the normal?" "I don't know, it just doesn't work." And he went over to the pneumatic controller for MUV 17 and he showed me, nothing happened. I said "did you check MUV 18?" That's the manual isolation to 17.

CRESWELL: You're indicating something there...

CRO: I'm indicating that I pointed to MUV 18 and that valve was in fact shut. And he says, "Ah," and other explicitives. And you know, I says you gotta wake up. I said you can't operate a plant this way. I came in another time. Now, I wasn't really taking over the shift but we were walking out the passage way coming in from Unit 1 which is normally the way we came in and every once in a while we'd

hear a safety go. And it would go for maybe 30 seconds then it would reseat. We'd walk a little further and it, pow, went again. What are they doing up there? I was with another CRO, we were just about ready to take the shift. I don't know. They're not testing them. I thought we were at power. You know, what would they be testing them now for? We got up there and what had happened was they lost feedwater, pressure in the steam generators went down to the point where they actuated in the feedwater latching system which cuts off all feed to the generators from the normal feedwater pumps, and it also shuts MSV 4A, B, 7A, and B, which are the main steam isolation valves. The sensing point for turbine header pressure which controls the turbine bypass valves is downstream of the MSV 4's and 7's. They restored normal feed, but they forgot to open the MSV 4's and 7's. So that the turbine bypass valves were seeing 750 pounds pressure and the turbine, the relief valves in the steam generators were seeing 1050, 1060. So everytime they tried to control pressure with the bypass valves, they had those in manual, they would close them down because they'd see pressure was starting to decrease, in closing down the pressure would come back up again and poof. It wasn't two minutes into the shift and Ray Boyer, the guy that was taking the panel said, "what are you trying to do?" He said, "you're blowing safties out there." "But we can't control pressure enough. And look at header pressure. It's down low." Right next to it is OTSG pressure. It was 1050. He says, "Man, what's the difference here." And he looked up and the MSV 4's and 7's were shut. He says, "crack those valves." They cracked the valves, they closed

the turbine bypass valves, put them in automatic and the thing came right on up 532 885. Now these are trained operators. I don't like to say that my shift was the best but, you know, I think we were.

CRESWELL: Let me ask you this. What are the difficulities that you encounter in operating a plant of this design?

CRO: Feedwater is very sensitive. It, I don't know. I don't want to say that feedwater is sensitive. When you move 11 million pounds of water an hour, that, needless to say, is going to be touchy, you know, whatever its just that a slight change in flow is gonna cause a big change in the steam generator, but not only that the primarly system is very sensitive. The pressurizer was totally too small. Any decrease in primary system temperature, which would result from an increase in feedflow, would cause the pressurizer level to go down and the pressurizer pressure to go down. It was really very hard to control in this respect. You know, I, in fact, when we, when I control the feedwater, the amount of feedwater to know how much to put into the steam generators to keep the reactor basically as stable, as stable as I can keep it in a transient situation. I look at reactor pressure. If pressure goes up I feed a little more. When I start to see it come down again, I back it off a little bit. And that's how I know where to keep feedwater flow.

CRESWELL: How do you, after a reactor trip, what are the immediate actions that you take? Could you walk us through what actually goes on?

CRO: Well, the first thing that you do is you insure that, you mainly trip the reactor. Okay, that just insures that, well, I don't know why it would, but the second thing says that you look up on the PI panel and verify that all the rod in-limit lights are on. You check to make sure that the turbine is tripped. That it's auxiliary oil pumps are operating. Make sure that the turbine bypass system is controlling steam header pressure at 1010. You close MUV 376, which is a letdown isolation valve. If pressurizer level gets down below 100 inches, you're supposed to start a second makeup pump and just keep it ready to go if you need it. If pressurizer level gets down below, I think its 20 inches, then you're supposed to open MUV 168 to admit more water. If the makeup tank is low and the pressurizer level is low, then you shut, or you open the DHV 580, which is allows the BWST to come down to the suction of the makeup pumps and then you shut MUV 12.

CRESWELL: Is that a valve you have to go out and manipulate manually or do you...?

CRO: Its one you have walk around 20 feet of panel and back 20 feet to open.

CRESWELL: What about the feedwater control...?

CRO: Well, if you have any feedwater stations in hand, you should verify it, you should run those back consistent to the parameter that they should be, in other words just take it and take it all the way down.

CRESWELL: What if they're in auto?

CRO: Well, if they're in auto you just verify that feedwater flow is coming back at a rate consistent with the header pressure.

CRESWELL: Now, they're set, the feedwater is set for 30 inches, right?

CRO: On the low level limits, right, yeah.

CRESWELL: Has that always been the case? It's always been set at 30 inches?

CRO: Well, 30 inches is the nominal, is a nominal number. It could be plus or minus. What they do is they set the levels in the steam generators at 532 degrees so that they could get 532 degrees 885 psig. If they need a little bit more heat transfer to get that 885, then they would raise the level slightly, you know, varied maybe plus

or minus 3 inches from 30 on either generator. I knew one that was about 32 and the other's 28.

CRESWELL: I guess you've had a chance to talk to the operators since the event. Have they noted anything to you that was peculiar about the event? Where they had to take special actions and...?

CRO: I really didn't get that specific with them. The only time I ever talked was in a bar room. And I, you know. I don't like to repeat what I hear in bar rooms.

FASANO: You mentioned that you at one time found MUV 18 shut. What reason would anyone have to have that valve in a closed position?

CRO: To the best of my knowledge that particular event came when somebody tried to change a light bulb in the ICV 5 valve controller. They removed the lens covers and everything. They pulled the old light bulb out and they went to stick the new one in and, you know, these were those PSB 120's that they're telephone lights. They're about that long and they have a contact making surface on either side of them about maybe a half inch. And as they slid this thing into the socket, it made contact with the hot side and the ground, it blew the fuse for that indicating circuit. It also took away the indication for all the other valves and happened to fail when MUV 18 shut, when they re-energized that.

CRESWELL: Was it, did maintenance repair it promptly?

CRO: I really don't know the time frame. What I saw, I understand it, how it happened. I can't remember when the trip happened. I knew they had a trip on that particular instance. I can't remember what the time frame was between the time that the fuse actually blew and the time they got it fixed. I wasn't on shift at that time. Then I do recall a sign back on that particular operating panel that said operators are not to change light bulbs in this panel, call the electricians. So we have to call the electricians and have a light bulb changed. Another one of Burns and Roe's designs.

CRESWELL: Okay. One thing we haven't talked to you about is why you quit.

CRO: Why I quit? About a year ago, well, it was even, no, it wasn't a year ago. It was a year ago. Back in June I had wanted to leave this racket for a while. I think it can be a good career. In fact I enjoyed my work up there. What I did, or what I had to go through to do what I did, it was hectic. When I left Met-Ed my blood pressure was 180 over 110, which for a man of 30 years old is outragious. My blood pressure had been high for over a year. In fact, I had gone job hunting back about this time last year and I had gotten a job but it was a little less money than I really wanted to take and it was in St. Louis, and I didn't want to move. So it wasn't really a spur of

the moment type decision, which a lot of people thought it was because of the accident. I did know that once the accident happened, when I realized the severity of the accident, I knew that it was gonna be a long time. I had just gone through 2 1/2 grueling years of bullshit, which is what it was, with GPU startup, UE&C startup, and then Met-Ed. And I didn't like being hassled by 3 or 4 different foremen and 2 or 3 different supervisors plus 3 or 4 shift test engineerings and various other mechanical and electrical engineers, you know, it was just too much. I couldn't take it anymore. I thought I was a good... There was shift supervisors that would actually stand over your shoulder and tell you exactly what to do. Raise steam water, you gotta get feedwater up, now check this and check that. It was, you know, ridiculous. I knew how to operate the plant. He should have been back there taking care of his paper work, but instead, he was right up there in the front lines, and trying to keep myself oriented in my own head I always had to listen to this guy. And if I wouldn't do something he told to do, well, he was right on me. He says why didn't you do that, why didn't do that. Well I didn't see any importance to do that right at that particular time. And most times I was right.

CRESWELL: Well, did they know what they were doing? The shift supervisors?

CRO: Yeah, for the most part, but they worried about the wrong things. You know, they put their priorities a little different than I did.

CRESWELL: What should they've been worrying about?

CRO: The overall picture. They should have been back staying taking a big, a big look at everything that was going on around them and not getting themselves involved in what the control room operator or the shift foreman is doing. The shift foreman could direct. Its a team effort and I tried to promote that my 2 1/2 years that I spent on that shift, I tried to promote team work. And it just didn't work. There were personnality conflicts, conflicts of interest, period, you know, the guy just doesn't do it the way I tell him, or the way I ask him or the way I show him that maybe that's the best way of doing... He wouldn't do it just plum because I told him, and he would do it just to defy me. Now, this, you can't have team work that way.

CRESWELL: Let me ask you this. When the supervisor was standing over you shoulder, was this during a trip condition or during normal operation?

CRO: No, this was during, in fact, I remember this startup really well. My problem has been diagnosed as labile hypertension which means it goes up and then I'm gradual to bring it back down. I don't have a constant high blood pressure problem. I keep things bottled up inside of me. This particular night I came in, I had the panel, we were scheduled to do a startup from 1% shutdown to 15% power. With all the paper work and everything that's involved in mode to mode checklists and the surveillance tests that had to be done prior to

going critical, getting the operators stationed where they needed, just getting the plant in a general stable condition to perform this thing, it takes a lot of concentration. It takes a lot of effort on the part of the control room operator to do that. At that particular time there was, in our alarm system is totally ridiculous, there were too many of them and the system that they have is it fails all the time. An alarm card could go bad and it would just send an alarm. It would just keep flashing in and out. You would silence it and it would just keep coming in. And that God-awful horn, it would just, you know, you're trying to concentrate on doing a startup and you got this buzzer going off and I'm particularly conscious of alarms because if you just ignore this stupid thing, what if you get one that's important. If you get one that's important and it goes unrecognized because you're ignoring this one over here you might as well not be in the control room. My job is to keep the plant safe. If I, you know, if I can't see what's going on around me then I felt apprehensive about the whole thing. I didn't feel like I can keep as close a surveillance on the whole thing as I really wanted to. I asked this supervisor, I'll even mention his name, Brian Mehler. I asked, I said, "Brian, could you have an instrument tech take a look at that alarm?" I said, "its driving me nuts." I said, "am I gonna have to listen to that all night through this startup?" "Well, I guess you're gonna have to." Those were his words pretty close. And with that I told him, I said, "I won't do the startup under those conditions." I said, "either get that thing fixed or find me a relief." And he said,

"you know if you become, if you are relieved you might as well get your lunchbox and take off." Well, at that particular point I wasn't ready to leave my employment there. Maybe it was a prayer, I don't know what it was. The alarm settled down and I didn't have to listen to it at that point. It did come back later but not until after the whole thing was done. They had an ECP there ready for me. I looked it over and I can generally tell whether the thing is gonna be close by just looking at the numbers. I've done enough of them, you know. And by just looking at the numbers I can tell whether they're gonna be...

FASANO: ECP end concentrator pointer...

CRESWELL: No, estimated critical position.

CRO: Estimated critical position, yeah. And this one looked good. It was, I think, somewhere around 60% on groups 6 and 7. It was where they wanted it no, no, I'm sorry. It was about 68%, its the closest I can remember, on group 5. No wait, no wait, I'm getting screwed up here. I've been away for a month and a half and it's a little...

CRESWELL: Well, I don't think that this is critical information.

CRO: Anyway. Well, just the way they operate. Its, the estimated critical position was something. We have a guideline if you go critical before half a percent less than when you're anticipated to go, you should shut back down. You should put all the rods in until you get the safeties in and then investigate why. So, I wasn't even, I was just getting to the minus .5% position and all of a sudden I looked up and I had an alarm, it was the startup rate rod withdrawal inhibit circuit. The only thing that throws that into count is 3 dpm in the source range. And I looked down and I did have 3 dpm in the source range. It stopped the rod motion. I put the rod stick in and he says, "no, no, no. Just take it down one." I said, "what do you mean. We just went critical here at 28% on group 5." I said, "the ECP called for a half a percent above that or better." Now that's alright. That's alright. We'll calculate a new ECP for where we went critical. Now that's what they did. Now that doesn't show on any log books or anything like that. But that is a fact...

CRESWELL: Was Mr. Mehler still a shift supervisor at this point?

CRO: Mr. Mehler is still a shift supervisor at that plant.

CRESWELL: At that point.

CRO: Yes, yes.

MARSH: Mehler was the one that was on duty at that time...

CRO: Yes. He was the one that I kept telling you that he would look over my shoulder. So I told him, I said, "I don't believe that that's right. I think that that is unsafe. I think that there's something wrong here." Well, we'll recalculate it and make it right. Which is what they did. They redid the numbers and somehow they fudged them, I don't know. They...

CRESWELL: Did they have a nuclear engineer come in?

CRO: To the best of my knowledge, no. This was on a midshift. This was pretty late at night, which normally that doesn't hamper them from calling anybody out but I don't recall any nuclear engineer coming in.

MARSH: CRO, you say they. Who else besides Mehler would be involved in that calculation?

CRO: The shift foreman.

MARSH: Which would be who? ...

CRO: That was. I can't recall.

CRESWELL: Okay.

CRO: I don't want to name any names if I can't be sure. Because we were well, Mehler is not my normal shift supervisor so I'm not sure that I was with my normal foreman at the time.

CRESWELL: Could you estimate when in time, it would help us to pursue this matter if you could give us the approximate date. Was it early in the startup test program?

CRO: Yeah, I believe it was right back before the relief valves.

CRESWELL: And that would have been like in April or May in 1978.

CRO: Right. Yeah, it was about that time.

CRESWELL: Okay. You mentioned team work before. Are the panel assignments clearly indicated to people when they're onshift?

CRO: Generally on our shift what we did was we had a panel operator. He was in charge of taking the, filling out the log book and just generally overseeing the operation of the plant in a wide scope. Normally we were at steady state. We also had a person that was assigned to what we call the switching and tagging desk, and he would take care of any safety tags that needed to be hung. He would also

perform the daily logs and the shift and daily surveillances and any computer information that had to obtained that day. Then we usually had a third operator that was assigned to surveillance desk and he would oversee the, take care of coordinating the control room and the auxiliary operators in performing monthly or weekly surveillance tests. If anything went wrong generally what would happen the closest guy to a section of panel, you know, like we used to divide it up into 3 sections. We had the secondary, we had the reactor plant and we had the nuclear steam supply system which was basically makeup pumps, low pressure injection and that sort of thing. And then the foreman, he would kind of rove around and maybe if he was in the back panel and if there was some valves back there that he could operate. This is generally the way we worked. If something happened, you know, you'd yell out and say...analyze the problems as best you could...and say, "we lost feed water." And at that time the three operators would come up and they would key in on a position that wasn't occupied and then take over.

CRESWELL: What about shift turnovers? What sort of turnovers did people ordinarily make to your knowledge?

CRO: Well, they varied between shifts. It depended who you turned over to and I always turned over to major stuff, any, I always let them know where they were in rods, what they were doing, whether they were coming in or going out. I let them know of any abnormal

conditions that existed in the secondary plant, you know, like they are doing a polisher vessel, regenerating that. Or we throttled this down and put this in automatic and something, maybe a major change throughout the day. Any jobs that were in progress, I'd go over to the computer and show him the primary system parameters, pressure, boron concentration, reactor power, and such things like that. We generally have a written sheet. Sometimes guys would draw it our for 3 or 4 pages and they would put the most miniscule items on there that, you know, generally I looked over those. But the major stuff, the turnovers, I guess, were generally pretty good and I say that on a steady state basis. Like, I don't know how may times I've taken the plant over in a transient and it was total chaos. You know, they'd leave, you know...

CRESWELL: You would have a turnover in the middle of a transient?

CRD: Well, maybe nor necessarily in the middle of a transient. I, let me rephrase that. Let me say after the transient was over, perhaps during the recovery which sometimes took days. But generally, you could get things straightened out in a shift to the point where, you know, the major work is done. The big things that have to be done and the small things. Most of the small things are done. The big things and they can come later, you know. But its really hard when you have a trip. There's so many things that you might have seen that you took some corrective action for, that maybe somebody else might

not have done that or maybe the procedure didn't call for but it was okay to do it. It was safe, it was c- ervative. And you forget to mention that to your relief, and you go this valve open and then you go and try and do something else and, you know, it just doesn't respond right and you looking around for a problem-why that dummy left that valve open. Why did he do that? You get mad at the guy because he didn't tell you about it but, you know, it was an honest mistake. I very seldom got mad at guys for poor turnovers because I generally made a pretty good tour of the, right after he left I would go around the plant, the panels, and look for abnormalities that I saw. If I had any questions I would ask the foreman.

FASANO: Did you have a check sheet or did you do this just by knowing the system, its all in your head.

CRO: Just by knowing the system, knowing how the board was to look. The positions of valves, you know, its like it almost becomes instinctive after a while.

FASANO: After a while.

CRO: Yes.

FASANO: You mentioned that you did have design concerns on both the nuclear and the steam side of the plant. Are there any ways other

than complaining verbally that you could have reported these to your management? I mean, are you people...

CRO: Yeah.

FASANO: Allowed to report things on paper?

CRO: Yeah. We can generally write a little letter to, you know, the cognizant engineers of the problem. And generally some of the operating conveniences, they used to take care of but things like, and we'd write these or even a verbal comment, they would normally jot it down themselves. They were pretty good. Sometimes they never got done, but at least they'd listen. But the major things, you know, like the relief valves, condensate hot well thing. I don't even know if he has yet today, whether that system has been modified. But, yeah, you could write him a letter and even a little diagram showing what you'd like to see, explaining maybe even perhaps how to go accomplishing the change.

FASANO: How about reporting to say other agencies? I mean can you, I mean talk to other people like ourselves or...?

CRO: Well, that is, I forget the part number. 10 CFR 20? I can't remember the regulation...?

FASANO: 21?

CRO: Yeah. Its the one where if you see the company doing something in violation of any rules that you can go to the NRC with the complaint.

CRESWELL: Have you done that?

CRO: No.

CRESWELL: Why not?

CRO: Because I felt that if I had of gone there, to the NRC, then they would come down on me. I was a little afraid of that.

MARSH: What makes you think that way? Do you know of other instances where this has happened? Have you been told anything formally or informally?

CRO: No. They never really came right out and told us that, you know, that you would be "prosecuted." But I just felt that knowing the way they operated that it would be kind of like being the black sheep now all of a sudden and it was tough enough to get along. I found it was tough enough trying to get along with the other people up there. Just, you know, team work type thing. And trying to develop the rapport of the other shift supervisors as well as with my own. That would just make it totally miserable for myself.

FASANO: You're mainly on Unit 2?

CRO: Unit 2.

FASANO: Do you have any knowledge that this is similar type of operation on Unit 1 or are they different? To your best knowledge. You know, I mean if you don't know, you don't know. If you do...

CRO: The only thing I can make is an assumption. The only thing I can assume is that the shift supervisors that are at the plant today were either former control room operators in Unit 1 or they were former shift supervisors in Unit 1. Now I can't help but think that they gained some experience in Unit 1. That's all I'm gonna say. There's nothing really else I can say about it.

CRESWELL: How about the performance of surveillance tests at TMI. Can you comment on that?

CRO: Surveillance procedures, I guess, sometimes I, well, I did a lot of them. In fact, I did the one that caused the first safety features actuation where I tripped the alternate feed supp. / to the inverter and lost a DC supply. I corrected that too, by the way, while everybody else stood around, looking around like they didn't know what was going on. Now generally, the surveillance procedures, we did them and sometimes they required a change, you know, like well

there was a small procedural deficiency or maybe a valve number was wrong or maybe there was a better way of doing it to get the end result. We would change those, the TLNs would take two licensed operators or two senior licensed operators unless nuclear safety was involved, then it would take PORC approval. We would change those, make them right. Sometimes in the performance of a test you couldn't get the required results and we'd go back out with the shift foreman and he would get the proper results. Sometimes we'd...

CRESWELL: Excuse me. Could you elaborate on that?

CRO: Well, an example, the emergency feed pumps, running at surveillance, it was a bear. Every time that we did the surveillance that they called for a thrust bearing vibration measurement and it also called for a temperature reading on the bearing and called for a certain differenital pressure, suction pressure had to be between a certain amount. We've never done that test where it came out the same way twice. So we tossed up our hands and we say, you know, what do we do? We can't get the reference values, we can't get the proper data. Okay, well never mind. I'll take this procedure and I'll throw it down at the surveillance... I assign people, the inservice inspection type and they would evaluate the data and then they would come up with a new set of reference data everytime. And of course the surveillance that we did would fall right into that. I never did understand that.

CRESWELL: Any other systems besides the emergency feedwater system involved?

CRO: I can't recall. I know that a lot of the balance of plant surveillance. It wasn't tech specs or balance or anything like that, that would go by the wayside. You know a lot of time it would call for maybe the secondary service coolers to be backwashed and we don't have time for that. Then you just sign it, you know, throw it in the basket not completed, and it would come back next week to do it, you know, never get done. There was a lot of things like that on the secondary side. We normally did all the surveillance that was required for tech specs, but there was a lot of times, you know, I can't really name any specific instances but...for specific procedures...but I know that there was exceptions and in the exceptions they could paper those away somehow. I never did really understand. I don't go in for that kind of thing. I figured if it can't be done by the surveillance procedure, you change it so that it can be done correctly and within the scope of the surveillance requirement or you don't do them, you know, you get the thing right and then do them.

CRESWELL: CRO, are there any other operators like you that are concerned about some of these occurrences?

CRO: Yeah. I would imagine that there's quite a few that are concerned. I'm not sure that their attitude is the same as mine. I

know that they like money. I mean obviously I didn't quite up there for a higher paying job and that I know that a lot them stay around there just because of the money, that they're afraid to leave because, you know, they like money so much. But not only that, I guess they're a little bit more, well, they are just cut out of a different mold. They're not as, they don't say things the way I say them. They have to be concerned. I can't really see where they couldn't be concerned. I have respect for everyone of the operators up there. I have respect for the supervisors too because well they went through hard times but somethings that they do I really lose respect for. There's a couple I just, you know, I wouldn't work with them for anything and that's one of the reasons I left.

MARSH: We are getting towards the end of the tape. The time being 8:14, so at this time I'm gonna break for a moment while I put a new tape on.

MARSH: The time in 8:15 p.m., the date is May 22 and we're continuing with the second cassette on interview of CRO. Jim, you were asking some questions when we broke to put a new tape on?

CRESWELL: At this point Hal, I'd like to ask you if you have any comments, any other comments. These are of an open nature, they can be directed toward NRC, Met Ed, whatever you feel like commenting about.

CRD: Well first, I don't know...this whole accident seems to me like a nightmare. When it happened, I didn't really want to dissociate myself completely from the accident, I wanted to be there to take part. But I realized that my health was endangered at that point, I knew that I had a problem. They say that high blood pressure has no symptoms but I could actually feel it. It was so tense inside that it was just indescribable. That's why I resigned, on the spot. I was looking, I had said before that I had looked for other employment and couldn't find any satisfactory to that point. I figured that by doing this that they would, that I would force myself into it and I would be finally rid of this, this emotional pressure. The emotional pressure- I operated the plant a lot of times, especially during transcients or tests, knowing that the plant was already 40 years old and they weren't even in commercial operation, and the plant was a wreck. It was dirty, there were oil leaks, there were water leaks, there were steam leaks, the design deficiencies that I had mentioned before, pump controllers not functioning, you know, if you want to start the booster pump because you need it, maybe it doesn't start because the auxiliary oil system has got so many leaks then it can't build up pressure. Just not being able to tell myself that when I go to do something at that panel, that what I want to do is going to actually take place. You know, I operated it a lot of times up there when I had the panel and I dreaded it. I really dreaded it. I would go in there and my stomach would be in knots for eight hours, I wouldn't eat anything, and I was on the verge of becoming an alcoholic, I would go out after

a shift and drink and it was terrible because I was becoming a physical and emotional wreck, and it was due to these things-the design of the plant, I knew how the GPU startup program and the people that performed those tests were all very smart men, but they had no common sense. They would have a test procedure, it would have more E's and D's than it had pages. And you can't conduct a startup program like that.

CRESWELL: What are the E's and D's?

CRO: Oh, those are exceptions and deficiencies. Let me say, maybe not deficiencies, I'll say exceptions for sure. But they had many exceptions to the test procedure. When Met Ed took a system and accepted it as operating properly, we still had the oil leaks, we still had the water leaks, we still had impellers in backwards, we still had suction strainers that would clog up every two hours of operation. It was a nightmare to operate the plant. Over a year ago, I told Bob over the phone when he contacted me that I told my wife over a year ago that that plant was an accident waiting to happen. Like I said, teamwork, interdepartmental teamwork was one of the biggest things that I saw was a detriment to that plant. Operators were always trying to pin something on maintenance, maintenance was always trying to pin something on the engineers, it was just a constant fight back and forth, the operators would get stuck with this because maintenance didn't want to do that. You have the maintenance people from Unit 1 would come over to do maintenance, "Man this place is

fucked up, who'd ever want to work over here?" Now how does that make an operator who has any pride in his work, any pride in his unit, how does that make me feel? After a while, it drags you down. Then pretty soon, you start taking on the same attitude. Management recognized the problem but they didn't do anything about it. In fact they probably did more detrimental to moral than anything else. They bring in a Navy captain to be Unit superintendant just because Jack Herbein, up there, wants to be a captain in the reserves. I don't know that to be a fact, but that's the rumors that go around. The administrative assistant that they appointed up there, four months ago, five months ago, a Navy captain. They had perfect qualified people, with a masters, they had a guy, a master's degree in personnel management, they brought in a Navy captain. I don't care how long you've been in the Navy, I don't think that Navy people have got an ounce of leadership capability. They don't know how to lead people. If you're in the Navy, they tell you to do something, if you don't you go to the brig or you go on report. Well, see I'm getting the job done, but they have to do the job. And it was getting to that point with me that they were telling me I had to do something and I cut them off, I fired him. You're fired. You can't fire me, I'm supposed to fire you. No, I'm firing you as my employer. You know, that was the type of atmosphere that was generated, I, and I finally had it. I know that with all good conscience all the other operators up there felt, feel the same way as I do, but they're just not willing to get out.

CRESWELL: I've got one other point that I'd like to cover. You're experiences with the alarm computer printer.

CRO: Yeah. I've had several experiences with that thing.

CRESWELL: Can you go into that in a little bit of detail? I'm interested in history of that printer and the problems that had been encountered with it.

CRO: Well first off, the mid-shift is supposed to gather up the paper that has been pushed through it during the day and then they make a nice neat package of it and give it to the operating engineer. A lot of times I'll see the printout for the day, I usually go over just to see what happened. But they, you can see where the typer would stop or the paper would tilt and it would just print a bunch of garbage. The alarm typer itself, it'll back up sometimes for, I've seen it backed up for as far as an hour, where it was printing out it was two o'clock in the afternoon and it was still printing things from one o'clock.

MARSH: Misalignment, and paper feed, paper jams, was that a frequent occurrence? I'd say in a weeks time or a months time, what would you expect in terms of difficulties?

CRO: Sometimes we'd go a whole week and not have any problems, but then other times we'de go and again, it was an operating problem, people didn't understand how the roller-feed mechanism worked and they would take and they would clamp the roller down to the, and make the paper tight in the roller where it shouldn't have been. And then if there's any misalignment in the back feed, and that roller overcomes the force of the little pins that stick out through the holes. And then that would cause it to run off the track and a lot of times you'de find that to be the problem. We never really had too much problems on our shift, but like I said, going back and looking through the logs for the day, when I would collect them, I'd say that I'd see maybe three or four times in a week, or on a shift, that we'd have problems like that.

CRESWELL: Have you ever known of an operator shutting the alarm printer off purposely?

CRO: No that depends for what purpose. Sometimes I've seen people turn it off, but the only time I can ever say that I saw anybody, in fact it was me that turned it off, was the fact that the alarm printer itself has the selectric and there's a little tape in there that moves the ball back and forth for upper and lower case. Well the thing got stuck on upper case and it was just printing garbage. So, at that time, I turned that typewriter off and then the utility typer is supposed to take over in that case and it didn't. In our case, now

I can't really say. I've have never personally seen anybody intentionally turn it off when it was functioning properly. I don't really see any need to do that.

FASANO: I have a couple of things I'd like to ask you. In the training when you were at the B&W simulator, did you go through simulated events where you actually did some practicing? Where they adequate in your opinion?

CRO: Yeah, we went through reactor trips, we went through turbine trips, they had individual instrument failures that we had to respond to with various stations at hand. It, for me, it helped me a lot. In the Navy reactor program, everything was done just manually, everything, there was no computer involved. It was such a simple system, it worked so well and then you come up here to a complicated mess like that is up there. In fact, I want to make that, I think the place is complicated beyond any technical ability to operate it. And maintain it. But I feel that the training that I got down at Old Forest Road down there was some of the best training that I ever got, in plant operation.

FASANO: Was the simulation pretty much what you can anticipate at TMI-2?

CRO: I used the control reactor pressure the same way.

FASANO: Yes?

CRO: Yes, it was very close. The only thing that wasn't really close was the size of the control room. The Old Forest Road simulator panel would fit inside this motel room, where you might be able to get panel 6-A of Unit 2's in here. It was a lot closer and working with it for 8 weeks, like we did, you became very familiar, it was very easy to have a reading become instinct to you where you can just scan the panel and see something, that was abnormal, it was good training that's really what I kind of worked on myself.

FASANO: Then, in your comments I gather, could you elaborate on how you would like to see a control room and what would you have different in this control room that could help the industry, for nuclear power import, for nuclear safety, and ease of operation to keep it safe.

CRO: Unit 2, the general comment that I have is that there is too much, well the panel, the front console is just entirely too big. And there's too many components that have to be operated from the back. Like, if you want to open a feed-water valve to recycle feed-water for clean up, it takes two people to do it, sometimes three. One guy to watch the pump, the other guy to jog the valve open from the back of the panel and another guy over at the computer to read the flow. Just

for a simple, ordinary manipulation, the whole control room could be a lot smaller, they could have less indication there. That may seem kind of dumb, but in Unit 2 they have so much needless information, like panel 6-A. I still don't know what those things were, those meters. I couldn't instinctively look at a meter and say that that is bus 26 volts, I couldn't do that, in fact, I just put it totally out of my mind, except for the ones for the generator and then I could look at those and say that's close, it's what it should be. And the other ones, it was a very hard control room to become instinctively familiar with, just due to the nature that you had so many gages that were not necessary, or if they were necessary, they could be located maybe somewhere off to the side, where you look at them every now and then.

CRESWELL: Could you comment on the location of the leakage recovery system panel.

CRO Yes, you can't see it from where you have to operate. So, if you're the only one in the control room, and the drain tank needs pumped down, you can go back there according to the procedure for routine operations, or to investigate alarm and correct that alarm, in which case you would, but you would have to leave the main operating console, with nobody there, which is entirely within the scope of the procedure. There's supposed to be at least one licensed operator in the control room at all times, and the procedure, operator at the

controls, it shows a shaded area where you can go, it shows during normal operations and normally it was within the confines of straight lines back to the wall to the shift supervisor's office there from the computer to panel 6, the electrical panel. If you had an alarm condition you could leave that area and go back along the side panels to the leakage recovery system, the ventilation control panel and then back to the RPS cabinets and some of the electrical relays back there, you could go back there to investigate an alarm. Which if you got a high drain tank or a low drain tank level you would have to go back there, if you were the only one in. In panel 25, the annunciator system there doesn't give you a flash on the front panel that you have an alarm back there. So, again if you're only one there and you push the button, it doesn't silence any alarms on panel 25, you have to run back, around the back of the panel, and push the annunciator silencer button on the panel 25.

CRESWELL: Previously you mentioned that you were having to pump down the RCDT about 4 times during a shift. Could you tell us what impact that would have if you were the only operator in the control room?

CRO: Well generally if I was the only one in there and I had to pump the drain tank down, what I would do is, it's one of those instinct things again, or not an instinct, but it's kind of like an operating method, so to speak. I would see the high drain tank level. What I would do is I'd go over and push the valve that admits the water to

the bleed tank from the drain tank at maybe 50 gallons a minute. And I would just let it pump. And then I would get the low level alarm and I find it, or I'd get an alarm, I'd find I couldn't silence it from up on the console itself and I would walk back and then secure the pump down at that time. A lot of guys would stand back there and wait, they'll just push the valve and stand and wait for it to pump out 10 or 15 inches of water.

CRESWELL: I've got three questions to ask and they may seem a little bit silly to even bring them up, but I do want to cover it and I would like to get any knowledge you've got personal, heresay, or even borrowing knowledge on any of these matters because they are relatively serious. First of all, would you know of any information regarding personal action by anyone that would have brought this event about or increased the severity of it? Anyone who would have had an axe to grind that in any way could of kicked this thing off?

CRD: Absolutely. I don't know. I've never heard anything to that nature.

CRESWELL: Then you are indicating in the negative?

CRD: That's correct. I don't know of anything like that.

CRESWELL: Secondly, from your experience, your work experience with TMI, what are the demeanor of the work crews when they are on duty? I'm specifically addressing getting lost, sleeping on duty type of thing. Do you have any comment on that? Any knowledge of people that going out and taking a nap when things are running in a good steady state?

CRO: On our shift we were pretty good, but we did have our sleepers, now the auxiliary operators, I know they used to sneak off for maybe an hour, two hours, something like that. To my knowledge, the plant was covered in his absence, that somebody else was if he was supposed to be someplace at a panel, he was covered. The only thing I guess really detrimental to the plant's safety would be if he was a fire brigade and didn't hear the fire alarm go off, or if we had a small break loca and he was the respondee and he wouldn't be able to take his action.

CRESWELL: Could you go into that a little bit, the small break loca respondee?

CRO: Well, we had two, one was a control room operator who had so many minutes... A month ago I could have spit these things out, no sweat. The control room operator would have like two minutes to recognize that you did have a problem. A loss of coolant accident, with the failure of a diesel on the side of the break, or the side of

the makeup pump didn't start. The control room operator would then go down to the, whichever affected valves, whichever valves did not have power and he would get on the phones and throttle open those valves two turns. And then at that time he would be in communication with the control room operator at the panel. The auxiliary operator, at that time, was to go down and open up the one remaining shut suction cross connect valve, so that all three makeup pumps suction valves, or suction lines would be tied to one common source, which would be from the borated water storage tank outlet valve to the decay heat suction header on the unaffected side. All this had to take place within ten minutes after the discovery.

CRESWELL: Do you have any comments on that?

CRO: Well, we were supposed to check the communication headsets once a shift, and I'm just as guilty as everybody else. It was just one of of those things that if the guy called you up and said, yeah, lets check the loca headset, we did it. I guess generally the feeling was that it was being done and it was being done at an adequate interval. I don't really think that there was any safety lost. I don't believe that it did that, but we didn't do, we had drills every month that we were supposed to run and generally those were run with a great deal of consciousness. I know that that one valve down there that they had to open was a bear, it was a bear to get open. But, I think that the requirement was for like 2 or 3 turns open and the requirement, it didn't have to be fully open.

CRESWELL: Do you feel that it was in your capability to respond as required, as control room operator for a small break loca?

CRO: Yes. Unless...they had scaffolding down there...if they ever took the scaffolding away, it would be tough. It would be tough on both sets of valves, the A and the B valve. There's no permanent scaffolding leading up to those valves. We've been lucky so far that it has been there, and you climb up and get it. As of today, I don't know if it's still there.

FASANO: This wasn't there purposely for the purpose of doing this? It just happened to be there?

CRO: It was there. I don't know if it was there for that reason or not, I really don't know.

FASANO: It might have been there for that purpose?

CRO: It might have been there for that purpose.

FASANO: In your opinion is it?

CRO: Yes, but then again, it may not have been.

MARSH: I have one last question addressing those areas that I wanted to cover. That's the fact that this event occurred on March 28th, which happens to be an anniversary of the plant. Do you have any information, or have you heard anything at all regarding the possibility of a party going on, concurrent with this or any type of celebration that may have been planned or taken place?

CRO: No. I have no knowledge of that. I haven't even heard anything about that.

MARSH: That's all I've got. Do either of you have additional questions? I'll open it you one more time, Hal if you have anything else, more you'd like to put on tape?

CRO: I don't think I should. No, I'm about drained. I really am.

MARSH: I would also indicate that if more comes to mind, or in cleaning your stuff up and moving around, you come across something you think would be of value to us, you have a phone number, you have my address, you have several phone numbers where you can get hold of me and I'de very much appreciate anything that you do come across additionally. Likewise, if in going over the tape, we do have some interests we would like to pursue a little deeper, do not be concerned if I get back to you again and would like to talk to you again. It does not indicate problems, it just indicates that we've found something of

interest that we'de like to pursue in a little more detail, so I'm going to hold on to your local number and don't get concerned if I try to get hold of you.

CRO: Okay, fine.

CRESWELL: We would like to say, very much thank you coming in on your own time. I know you've got to travel a ways to get here, and we've taken up most of your evening, we very much appreciate it. You've given us some good meat to consider and get into. We'd just like to say thank you for all of NRC.

MARSH: The time being 8:41 p.m., at this time we are going to terminate the interview of CRO, the meter reading on the second cassette is at 466, so I'm ending at this time.

Regulatory Commission on or about September 12, 1979, Misters Evans and Vandenberg from the NRC Three Mile Island Special Inquiry group?

THE WITNESS: Yes.

BY MR. ORNSTEIN:

Q Do you have a copy of the tape that was made at that particular meeting that you had?

A Yes. I have half. I have half a tape. The other side didn't come out. I do have a copy of a transcript which was made from the notes and that tape.

Q Was that a transcript that they made or a transcript that you made?

A No, this was a transcript that they provided me. It wasn't verbatim. It was more or less set up in questions and answer type outline.

MR. ORNSTEIN: I would like to enter this as Exhibit 1203 and have you identify that.

(Whereupon, Exhibit 1203, a document, was marked for identification.)

THE WITNESS: This appears to be the document.

BY MR. ORNSTEIN:

Q Did you examine a facsimile of this exhibit and review it in any depth?

A I reviewed it. Not to any great depth. Just I wanted to make sure that the general content of my answers and the way an answer could be misconstrued, I wanted to make sure that it wasn't, in fact, misconstrued during the translation, and I didn't find any of that to occur.

Q If I understand correctly the version of these three exhibits, 1202 and 1203 that you have seen are correct from the standpoint of the statements that were made, and if we refer to them -- Strike that, please.

Now, you mentioned the fact that you had spent several years in the Navy program. What was your particular designation?

A I was an electronics technician and later qualified as a reactor operator.

Q For how long were you an electronics technician?

A I was an electronics technician for five years and a reactor operator for about two and-a-half.

Q During that period of time you mentioned that you were assigned on shipboard duty?

A That's correct.

Q And during those two and-a-half years as reactor operator you were on a Nuclear Submarine?

A That's correct.

Q And the work that you had done for the Navy and your training program you had certain formal classroom training, is that correct?

A That's correct.

Q Could you reflect back and tell me what you noticed that was outstanding in the Navy training and the Navy training program relative to that of which you received from Metropolitan Edison in your work with Met Ed as training for Auxiilliary Operator as well as that of a Control Room Operator?

A There is a lot to put together here. I didn't realize -- I could have done some preparation, but I didn't.

I know that the Navy Program was done by top-notch people.

I mean the Admiral had to handpick all of his instructors. He met each one personally, and if he didn't -- Like anything he saw about the person, he just ousted them. They couldn't be instructors.

They had a regular systematic approach. It was more or less programmed almost as to

your progression through your training.

You never learnedtoo much too fast, and you also understood concepts before another one was introduced that would later reflect back to that concept.

So it taught you to think and be analytical to that standpoint.

Met Ed, the Auxilliary Operator training really didn't -- We didn't have what I would call top-notch instructors. They were knowledgeable, but as far as their ability to put together a program, it is my opinion that they couldn't do as professional a job as a Navy Program would be put together.

So, therefore, it was haphazard, and the learning I don't believe was as thorough.

I don't believe that we got as much out of training as we could have had it been more programed.

It is also my opinion that I think Met Ed did a fine job of training us with what they had, and people, material-wise, I think they did a fine job.

As far as the Control Room Operator training, I had eight weeks of intensive training down on the Simulator, Babcock and Wilcox.

That was eight weeks of classroom covering instrumentaiton, controls, various things like that, and then actually applying the classroom knowledge in the Simulator with casualty actions, simulated casualties.

That to me was invaluable, and I know it was invaluable to a lot of the other fellows that went down there with me because a lot of them never stood a watch on a panel like that before. They were out in the engine room turning valves and things like this where I had some hands-on experience with casualties from a panel.

I know it helped them a lot being able to recognize and analyze problems real quickly. I thought that that program was well coordinated, and I think everybody came out of there was at that point a competent operator just on that particular -- they developed skills there, however, that they become instinctafter awhile, so no matter where you go you can use these instincts that you have learned there and apply them to the realm of a control room the size of Unit 2.

After the training that we got down in Lynchburg we had several sections learning [illegible] out

individual components. Reactor cooling pumps is one I can recall.

It was just basically review-type, keeping us refreshed on certain ideas and concepts.

We had a two-week cram course so-to-speak right before we had a simulated NRC examination that was given by I can't remember -- General Physics. They gave the simulated walk-through, and I took that.

I didn't make it but, you know, they all do that.

Q I don't understand.

A Well, I didn't pass that examination.

Q Simulated walk-through?

A I didn't pass the simulated one.

Q However, later on you did pass an actual walk-through?

A Yes, that's correct.

Q Was that due to the fact that you trained more, or was it that the NRC walk-through was easier?

A No, an NRC examination to me is never easy whether you know the answer, whether you know what they are going to ask you.

And everybody has a basic [illegible]

they are going to ask you. They are going to ask you some questions about the reactor. They are going to ask you some questions about the turbine. They are going to ask you to go out in the plant and find components.

It's a standard thing. If they don't cover that they haven't really -- The NRC hasn't done their job, I think.

My basic impression of an NRC walk-around, and examination is thorough knowledge, basic knowledge, and also the walk-around part of it I think should be to test the composure of the examinee.

In other words, how well does the examinee stand up under a stressful ten-hour examination with questions from anywhere.

This was my idea of an NRC test so, therefore, I conducted myself during the examination with a great deal of calm, thinking the answers out before I gave them.

Some guys were petrified. You know, they would just stand there for two hours, but I wasn't like that just because that's the way I thought an examination should be.

And it's impossible for anybody that's

not associated with the plant to ask everything, and everybody can't know everything. You know. So --

Q You mentioned the fact that you had difficulty with the General Physics Corporation walk-through. I assume that was several weeks prior to the other walk-through for your license?

A I believe it was a month or a month and-a-half before the actual.

Q Do you think it was because you were more up-tight as opposed to not knowing as much, or was it a combination of both?

A Well, at that particular point in time I was stressed in another way not involving my job, and so I think that that probably had a big bearing on it as well as I didn't think the guy that was giving me my walk-around knew as much as I did, and his concepts were completely in left-field, and he based my answers on -- Or the grading of my answers on what he thought it should be.

Q Did you discuss your observations with anyone from the training department at Met Ed subsequent to that particular walk-through?

A Oh, yes, yes, and, you know, they all say that this is just general -- Now, I'm not quoting

anybody, but the general concensus of the training department was, yes, they are always tough. They want to -- I don't know if it is to instill a feeling of fear into the examinee or what.

I think it's sort of that type of thing, perhaps to make you feel not quite so ready; a bubble buster so to speak.

And then we did have, I know, two weeks more of refresher training after the walk-around, the mock walk-around before we took the test.

Classroom, and we brushed up around the plant and ever thing like that.

Q In the interview that you had with the NRC Special Inquiry group people you mentioned the fact that there were some typewritten copies of some walk-through exams that were held at other facilities as I believe there may have also been some at Three Mile Island.

I would like to enter this as Exhibit 1204.

(Whereupon, Exhibit 1204, a document containing a number of examinations, was marked for identification.)

BY MR. ORNSTEIN:

Q Have you looked at that?

A I didn't think I gave you so many.

Yes, these are the documents. They appear so. They appear to be all there.

Q Okay, did you use these documents in any way, shape, or form to assist you in preparing for any of the NRC examinations?

A Knowing my philosophy which I just told you previously, no. I didn't use them. I had no need to.

Q Do you recall when you first received those documents?

A No, there would be a time frame up to a year probably that I could have gotten them. I know I had them in my locker for quite some time.

Q Was that before you became a candidate for a Reactor Operator subsequent to your being an Auxilliary Operator?

A Yes.

Q Was it before you passed your Auxilliary Operator examination?

A My Control Room Operator.

Q I'm sorry, that's correct: Control Room Operator Exam.

A I can't recall.

Q Do you recall what the source of this set of documents was?

A I wouldn't -- I know somebody gave them to me, but I can't remember who it was.

You know, if I could kind of visualize when I got them I could probably visualize the face, but I don't really know.

Q Were there a large number of people like yourself who had this set of documents?

A Yes.

Q It was commonplace among the --

A I would say so, yes.

Q Was it ever mentioned to you how the documents from St. Lucie walk-through exams wound up at different utilities?

A Yes, but I really just assumed that it's like, you know, nukes are one big family, you know, and one gets a pat on the back from another, and the other wants to respond. It's just that way.

I mean look at the insurance policy that Met Ed has, five hundred million dollars. Who pays for it? All of the other utilities.

It's just like St. Lucie says send

copies of this out. I would assume that's how they do it.

Q Would you know if this was something done by the training departments or the individual operators or the plant superintendents or --

A I have -- No, I wouldn't have any idea. I have never seen any of this go on, so how would I know how it's done?

If I wanted to sit down in front of a tape recorder for ten hours and talk about what I talked with my examiner about I could do that, and then they could transcribe to whatever they want, but I really don't know how it's done.

Q Do you know if Babcock and Wilcox and the training department were involved in this at all?

A No, I do not.

Q Do you know if these walk-through exams were transcribed from tapes that were held on the candidates' person as they were actually walking through the plant as opposed to a debriefing subsequent to the exam?

A No, I don't know that either.

Q When you had your walk-through exam for the Three Mile Island Control Room Operator license were you debriefed after the exam was over?

A No, not by anybody other than myself. I debriefed.

Everybody wanted to know what -- You know, just among my peers. None higher up.

Q Was a transcript or recording made of these observations that you made?

A Not to my knowledge.

Just to put it on the record, I have no knowledge that Met Ed ever had anything to do with transcribing walk-throughs, and I can't help but think that you are diving for something here, and all I presented you with was a set of documents which I received from training.

I realize you are interested in these documents but, you know, I, like I said before, I don't know where they come from. I don't know who makes them.

Met Ed doesn't make them that I know of so --

Q You said you received them from training. Now, does that mean somebody like Marsh Beers, Nelson Brown, or Dick Zechman?

A It's possible that they could.

Q As opposed to someone like Collen[illegible] or someone like that?

A No, I don't think it would come from anybody like Cellenger. It would probably be maybe Unit 1 Control Room Operator had had a copy and, you know, he gave it to someone else who was studying for a Unit 2 license and, hey, these are pretty neat. I might make some copies of these and see if anybody else wants them.

And he might go about distributing it that way. That it happened that way I don't know, but it was just one of the mechanisms that was frequently used for other things.

Q Yes, but I got the impression from what you just mentioned a few minutes ago that it was coming from training as opposed to operations. Is that correct?

A I assumed that they came from training.

Q No one actually put a stamp on them saying, here for your perusal, or to help you for next month's exam use this but don't tell anyone where it came from?

A No. It wasn't like that.

Q Getting back to comparisons with the Navy Training and the Met Ed Training, did the Navy teach you or have courses or lectures on thermodynamics and phase change in the primary system, as well as phase change in general and the PVT relationships and such?

A Yes, they did.

Q And did the Met Ed Training stay after the same?

A I can vaguely remember a lecture on that subject, but I think as I recall it was only taught one time, and that was it.

And it wasn't all in really that much depth.

Q Did --

A I think you might -- Are you referring to the Zirconium Hydriding?

Q No, I was referring to saturation conditions, two-phase phenomena not necessarily associated with hydriding, generation of steam voiding saturation.

A Yes, they did talk about that. They talked about heat flux versus water temperature in saturated systems, what happens, nucleate boiling, bulk boiling, film boiling.

They talked quite a bit about it, especially the steam generators.

Q They being --

A The training department at --

Q Met Ed and the Navy?

A Yes, both.

Q Was there any emphasis in your Met Ed training

on the possibility of boiling in the core?

A Yes, but as long as we didn't exceed a safety limit there should be no boiling.

Q Did the Met Ed staff instill within you an understanding of the saturation temperature and pressure relationships which were behind the safety limits, or did they just say, "Hey, this is the limit, and this is what you have to make sure you do or stay within"?

A Well, there were several different curves that we operated by based on how many reactor coolant pumps we had operating, and they were the flux flow imbalance curves.

And they always told you that as long as you stayed within lines the departure from nucleate boiling ratio was always going to be greater than 1.03.

Q 1.30?

A Yes, 1.30, and that boiling won't occur.

And then also they did dimension DNBR, what it was, how we got it. How we got the term, things like that.

Q Did they instruct you about going solid in the primary system?

A They said you don't ever want to do that, and that was -- That's my extent. That's all they said.

Q Did they ever instruct you about pressurized level and the fact that high pressure injection was to be kept on as long as the primary system pressure was below a certain point regardless of what the level was or was it a matter of looking at the level instead of the pressure or both pressure and level?

A Okay, to the best of my recollection we were told that we should follow our indication and also knowing it was heresy to let -- You were committing a heretical act to let the plant go solid.

If I saw a pressurized level going up greater than 400 inches, which is top scale, I would turn the pumps on myself. I would do that probably after I checked all the other three -- Or all the other two channels, the other two redundant channels I would check to make sure that those other two are responding the same way.

Q Did the Navy Training differ?

A This is taking me back here.

(Whereupon, a technical discussion followed, off the record.)

BY MR. ORNSTEIN:

Q Can we go back on the record.

Was there anything in the Met Ed

Training that hinted or indicated that one should throttle back the high pressure injection on certain transients in order to prevent a SCRAM and allow a ICS runback?

A I don't think I understood there. I don't think it's possible what you just said.

Q Well, the high pressure injection can be initiated automatically. However, the operator has the capability of throttling back the number of gallons per minute that the system is delivering, and the question I had is do you recall anywhere in your training the suggestion that you throttle back the high pressure injection at any point in order to prevent a SCRAM?

A I never been told that by Met Ed.

Can I say that if high pressure injection has occurred, automatically the reactor should already be tripped.

Q Well, on a turbine trip you don't necessarily trip the reactor.

A No, but if you do get high pressure injection you will have a turbine trip automatically at low pressure or variable pressure temperature.

Q But you will not necessarily have a SCRAM.

A Same thing. All the rods deenergize and

go in the holes.

Q Well, the idea of the ICS needs to allow the plant to remain at some hotel load or house load while you try to fix the problem with your turbine or the initiating event and not actually SCRAM per se.

Let's proceed on to other points. When you were with Met Ed you mentioned the fact that you were initially an Auxilliary Operator. I assume you came in on the Auxilliary Operator A-level?

A That's correct.

Q That was because you had additional training compared to one who would be coming in at the Auxilliary Operator C-level?

A That's correct.

Q And as time went on you applied for the position of Control Room Operator, is that correct?

A That's correct.

Q What was the incentive available to people like yourself to become a Reactor Operator as opposed to an Auxilliary Operator?

A Well, for one thing it was over a dollar an hour raise just to start, and then, of course, after you progressed through the training period it got progressively more until you got full rate for CRO.

When you obtained your NRC license you got at the time it was $21.00 a week extra license bonus, and for my own personal reasons for taking control room operator, I wouldn't go any further if you don't take what's ahead of you.

I didn't want to be an auxilliary operator the rest of my life.

Q Did you find that there were any drawbacks associated with being a control room operator?

A Any --

Q Drawbacks?

A Oh, drawbacks. I guess the real drawback that I could see was being in close contact with so many people at one time, especially during the hot functional testing and the start-up testing program.

There were engineers and people just congregated in the control rooms looking for information, trying to run tests, and, of course, any tests that are going on in the plant have to go through the control room operator or through the shift foreman via the control room operator.

Of course, he has to keep all these things in his mind somehow and keep them with a fair degree of arrangement. That, plus all the

constant hounding by people other than the people running the tests like can I get this valve closed and opened, it was just a constant harassment for eight hours.

Q Was the Auxilliary Operator free of this kind of harassment?

A Yes. Basically the only harassment he got was from us, the Control Room Operators.

Q Now, did you find a requalification program to be a burden on you as opposed to having staved an Auxilliary Operator?

A No, I don't think so. This is my own personal --

Q Well, when you studied for your requalification did you study on your own time or was it exclusively on company time?

A Well, as I recall we had three operators, three Control Room Operators at the time.

One guy was designated as surveillance coordinator, and that job normally took maybe an hour into the day until you could get all the papers shuffled out to the appropriate people, and then if there was any for the guy to do, then he would do it.

It wouldn't take too long, and I

would use that day to go in the back where it was a little quiet and review my notes and things like that.

I got to see my wife little enough yet alone taking home a pile of books to study till I generally studied on company time.

Q Was that the norm? Did most operators do it that way?

A I really don't know. I don't know -- Some guys took them home. Other guys didn't.

Q Did Met Ed give you specific homework assignments when you were in the training program for your initial Reactor Operator license? That is would you go over material in class and then be expected to produce certain problems or feedback certain information the next day, or was it something that they did not expect you to do anything at home and it was mainly while you were on whatever site or classroom?

A Okay, I think I'm picking up what program you're talking about, and it's the one that's conducted by Met Ed's training through the licensing year.

In other words we have -- We had various days of training. We would go down to the training building and sit, and we would study say five emergency procedures, and they would give us two hours,

three hours to study them.

They would have an instructor to go over them with us, and at the end of that session we would have an examination, and they would be graded.

If we got less than an 80 on it they would send it up to us in an envelope, and we would have to complete it by such and such a date to get credit for it.

But none of that generally had to be taken home. I don't think anybody ever took any of that home.

Q Now, did it work the same way in your initial license studying or preparation? That is not the requalification program, but the cold training as you had or the hot training as it may have been?

A Yes, we had basically it was what we call the OJT book, and it was -- They had all the systems listed, and a general study guide for each system.

And we had to study the study guide for the system, and then we could go to a shift foreman or a shift supervisor, and he would give us a checkout on it.

I might say at this point I was a part of the first group of operators to be licensed at

the initial -- The initial batch.

The people that were licensed after the initial group of October 20, '77 they started in on the company program which was another program thing.

You know, they asked them a lot of questions about the feed pumps, and then they would have a test, things like that.

Q But it was mostly studying while on the OJT program or something which did not really involve a lot of outside study where you weren't really expected to take all the stuff home with you and spend hours on end?

A If you had to do that to get the license they expected you to take things home.

Q Now, did the Navy operate the same way?

A I guess in a basic sort of way.

They won't let you go home. If we needed an extra two hours of training at night because we didn't do so hot during the day they said, "You just can't go home until 6:00 o'clock."

That's just a little push, but that's what they do.

Q Now, I have been made aware of some nuclear plants in which I'm not sure if it's AO's or CRO's have been stopped at the gates by union stewards and told to

leave their books at the plant, th
the work home with them, that it wa
done at the plant on utility time a
own time.

Do you recall se
occur at Three Mile Island?

A Not to my recollection.

Q Was there very heavy union
the conduct of business for the Auxil
and Control Room Operators?

MR. SMITH: Off the
minute.

(Whereupon, there wa
off the record.)

BY MR. ORNSTEIN:

Q Back on the record.

When a person like you
new position, take for example the CRO pos
was the basis upon which you might have bee
salaried, changed upwards or downwards?

A It was seniority. Company senio
mined if I got the job.

If there was 13 openings

the 14th in seniority I wouldn't get the job. The other 13 would.

Q Okay, once you got the job what about increments in your salary and reviews or annual reviews? What kind of measure was there in determining your performance and your eligibility for raises?

A Okay, we had periodic reports. I can't recall if they were monthly or every six months. I believe they were monthly or 90 days.

Every 30 days we would get a report, and it was a standard Met Ed form that his attitude, his work attitude, is he picking up the concepts of the new job; you know, questions like this, performance, and then they would be rated by the supervisor.

Q. Were there any specific things listed? For example turned vavles so many times, did so many things to cause so many reactivity changes, pushed the wrong buttons so many times? Was there any such assessment made of the operators?

A No. Basically what we do there was if we had a person that was in training for a license and he needed to do five reactivity manipulations we would actually -- He would stand by a licensed operator and go through everything before he actually did it, and

he would make the reactivity manipulations, and then we would log it into the main OR log as so and so performed reactor start-up under direction of licensed operator Hal Hartman.

Q This would be primarily for satisfying some NRC requirements for the license, but it was not something for a Met Ed assessment having anything to do with the employee's salary?

A No.

Q Now, getting back to --

A Okay, the former question, I think I understand that.

Q Yes, that's what I was going to get back to. I think what I am trying to get at was if there is any real record made of having a man stand back and say, "Okay, he pushed the wrong button that time. Mark it down." Things like that, there was nothing like that?

The performance of an operator was based on blank? You fill in the blank.

A That is a tough question. I really don't know what they base it on. I don't really.

Maybe the shift supervisor likes this guy. You know. Maybe he really is good. He

just beams out all over as being good, and they know it.

Q I get the impression that you are saying it is sort of a subjective-type thing by the supervisor as opposed to a quantifiable thing?

A Well, first let me say that during our training -- Now, you can talk two different groups.

Q Okay, training and operating.

A: Training and operating. Well, during the training period precriticality. Okay, we had cold license. Our training differed after we went critical. Then there was a separate.

They do walk-arounds that they took every so often. The candidates had walk-arounds that they would take, I don't know, every couple of weeks or every couple of segments. They would have a walk-around with one, a member of the training department, would come up and walk around the control room with him, and they would go over those systems. Okay?

And then he would make an evaluation based on that walk-around, and they would do basically what an NRC examiner would do, start this pump and then you were supposed to get the procedure and line-up the correct valves and so on. You know.

This was a following for I thought

it was an extensive set of questions that were given to you on specific systems that you had to answer subjectively.

They were graded and returned to the candidate before his walk-around, and this was progress, and generally it took a candidate nine months, and they would give him a mock NRC test of their own, a written or oral.

And from their day would determine whether they would send him up.

Q Okay, that was one where the Met Ed requirements was you had to pass a certain exam within a certain period of time or you went back to where you were before, I believe?

A Right.

Q Okay, but let's take the case, the other case. That is you now have the license.

A Yes.

Q The question was one of are there any quantifiable things upon which the advancement of the individual as far as pay step and such go or is this merely a matter of seniority and not making any waves?

A Once you got to be control Room Operator with a license your pay went no higher, and you were

just stuck unless you got promoted to shift foreman, and that was the discretion of generally the shift supervisor and the plant superintendent.

Q Did you not need a senior operator's license for that?

A That's correct.

Well, they would promote you, and then they would put you on a senior operator training program, but you wouldn't fulfill that capacity until you had a SRO license.

The other thing that we had just to maintain the proficiency was once a year we had to do certain things, operate the plant and any major evolutions which we performed were documented under I forget the column, but this was just general things that we did.

Then we had reactivity manipulations, and we had to do five of those with greater than one percent change or something. I can't even remember that exactly.

Q This is basically the NRC operator licensing requirements for requalifying, I guess, that determined this kind of thing?

A Yes, and that was really all we had.

Q You mentioned the fact that you did have simulated training at Lynchburg. I believe you said it was an eight-week program in obtaining your Reactor Operator license.

A That's correct.

Q Now, had you had subsequent simulated training after October '77 now at Lynchburg?

A Yes. I had one week at approximately the last week in June of '78, and another week approximately the week of the 28th, March 28, 1979.

Q Okay, and that was a predetermined program that Met Ed had many operators going down in order to stay current and be in fulfillment of the manipulations requirements for licence renewal?

A I'm not sure I know what you mean.

Q This training that you had at B&W on their facility, the simulator, that involved manipulations of the simulator controls?

A (Indicates yes.)

Q And I assume in your case you must have been involved with numerous manipulations so that you did without that simulated training actually meet the NRC requirements for renewing your licence in 1979?

A That's correct, at the plant.

Q Right.

A (Indicates yes.)

Q And the thing that it must have done was to assist you in understanding certain transients which you did not actually experience during the year?

A That's correct.

Q And I assume that also it was geared so that people who were not at the controls per se like a senior operator would have an opportunity to actually manipulate the controls, is that correct?

A That's correct.

Q Now, again I'll ask you to try and go back a bit in time.

I assume that in your Navy program you used or had been exposed to the simulator that the Navy may have had in your training?

A We didn't have simulators in the Navy.

Q You did not have any Navy simulators at all?

A We had prototype training centers which were actual reactors. They were operating.

Q On those Navy prototypes did you undergo similar casualty events such as you had at Lynchburg, or were they more complex?

A It's really difficult to answer the question

because of the nature of the two plants. One is a very simple plant. It is so stable it's ridiculous, and all you do is pull rods. And that's it. Everything else is so self-regulating that it takes care of itself basically.

The Babcock and Wilcox is quite a bit more complicated to operate. By failing a TH instrument high on one plant it would do a multitude of things where it had an automatic control system that looked at that parameter.

If you failed TH high in the Navy plant you would look up and say, "It's high. What's the other one read?" Which was right below it, and it reads okay.

"Oh, I must have had an instrument problem back there," and you know that -- To kind of say the casualties were as complex, I don't know. I have a hard time answering that.

Q Okay, the simulator in Lynchburg, was that of a reactor, another facility? That's the SMUD branch of SECO simulator?

A That's correct.

Q Did you find that this detracted somewhat from the training with regard to Three Mile Island, or was it something that you got used to fairly quickly?

A Yes, I got used to it fairly quickly so it didn't -- It didn't really -- I'm very easy to reorient like that though, and I adapted down there within hours.

And some guys I guess it still bothered. I don't know.

But myself, I didn't find it annoying or anything like that. It didn't deter from my training.

Q I'd like to go back to a statement that you said which was rather interesting, and that is I got the impression that in the Navy plants it was fairly easy to detect an instrument that wasn't working right?

A That is correct.

Q And I gather that it is not quite the same at Three Mile?

A It's a nightmare. You know.

I had mentioned before in some of these things that certain operators should develop a sense of, you know, when they sectionalize a panel regardless of what kind of indication it is style-wise, an operator should be able to look at a section of the panel and just scan it for a second and realize if something is not really right, and then, you know,

Now, a lot of guys wouldn't do that, and they would become locked in on just certain gauges, you know, and that's really a bad part.

The gauges, themselves, were hard to read because they were vertical. They were only about an inch wide by I'd say ten inches high.

The needle was very small, and these were the ones on the main console and in back; for instance, extraction, steam pressures, and temperatures were gauged on a meter with a face an inch wide by say three inches tall.

And to view those gauges you could probably get as close as twelve feet to them, which requires fairly good eyesight to be able to read the exact values.

But you could scan it, and you can see if your paramoters are about where you think they should be.

Q Did you ever have an opportunity or confrontation with anyone at the plant where you expressed your observations on some of this equipment?

A Oh, yes, but I really don't know who I would have said it to.

If I said it to anybody it would

have been somebody that I was working with at the time. You know, probably a shift foreman or a shift supervisor.

As far as names, I don't really know, but I did mention the fact that I think there is too much, I think there is a lot of extraneous garbage in that control room that could be taken out and compressed into a workable size where one man could scan the panel and know exactly what's going on, make it easier to read, sectionalize it a little bit better.

They have things all over the place.

Q Do you ever actually say to someone: Hey, this is like this, and it really ought to be like that; or is it just a matter of simple discussion without any change ever being expected to take place?

Well, let me back off and ask you in a slightly different way. Was there anything in your manual of procedures of being an operator which would allow you to raise to management what appeared to you as a significant or even possibly a safety concern for a plant and its method of operating or information that was available to you as an operator?

A Well, generally if we just had a simple problem like a meter was incorrect we would go to the shift foreman and say, "This thing isn't operating properly. Shall we turn in a work request?"

And he would say yes or know, and the course would proceed from there. And either the instrument man fixed it or the work request was disapproved along the line or something.

I think if I was operating the plant and I saw something that was really serious I'd mention it to the shift supervisor.

You know, maybe we have a better way of doing this. Maybe we should take a look at that.

Q Did such a situation ever occur?

A Yes, I mentioned to him about the polisher system, which was terrible. You know, the situation was just terrible. They didn't have any automatic bypass around the vessel so that in case a vessel would go on a high differential pressure, that is we cut flow off to the booster pumps and subsequently the feed pumps.

And if they had an automatic val in there that was air operated that would send the

high DP in the system that could go open just right away and keep this and condensate booster pumps with some water; everything would have been all right.

It was at least six months before the accident if not longer that this question had been raised by other members of the control room staff to their shift supervisors, and I know I and the other operator that I worked with, I know he had mentioned, too, that an automatic valve there, it would be ideal because we had experienced these problems with the polishers before.

Q This was all oral requests or suggestions? Was there anything in writing that was put down on that?

A No, not that I can recall.

Q Were you, as a reactor operator, familiar with the specs for the plant?

A I was familiar with them, yes. I could generally tell you if there was a tech spec on a certain item.

I couldn't recite it word for word, but I know where I could go to find that information.

Q Were you familiar with the tech spec or

operating procedure associated with the tail pipe from the PORV and safety valves?

A Yes.

Q If you knew that a situation existed where the plant in that area was not within the tech specs or operating procedures, how would you go about apprising management of this or what would you do to get it corrected?

A Well, what I would do is just I would talk to my shift foreman, and if I didn't really get any satisfaction out of him I would go to the shift supervisor and tell him, you know, I think we've got a problem.

Q Did you ever do that with regard to that particular temperature?

A That particular problem I was -- I never wrote anything down except I -- volumes of water that had to be exchanged, I thought that was testimony enough that we did have a problem.

Q Well, were you --

A But --

Q Go ahead.

A But I did talk to Bernie Smith and Dick Hoyt about this problem, about the leakage out of the valves, and they just said, "Get a good leak rate."

And whenever I did it I passed it off as often as I could.

I would just say, "I couldn't get a good one all night," and keep doing it that way.

They had three days to get a good one, and sometime during the day or during the night a good one would come up, and then it would have to go for three more days until they would get a good one.

Q Was there anyone else you could have gone to with this concern?

A I probably didn't go to anybody because I thought that this was such an obvious problem that the people that I could have gone to were already notified.

I think you're getting at that I could have gone to the NRC.

Q Well, I'm not getting to that. However, that is an ultimate avenue that one could take, but I was concerned with finding out what specific guidelines there are within the Met Ed Organization that would allow an individual like yourself to notice that you were being stifled by the next layer of management and try to raise to the surface a concern without rocking the entire boat like what you just --

A Yes, I really don't think -- I was kind of afraid of rocking the big boat up there.

It seemed to me like they were totally unpredictable. I knew they were aware of the problem, and their minds are greater than mine. They could do things with their heads that I could never imagine.

Q Was there some quality assurance function or some quality assurance group that was depended upon by Met Ed to make sure that this kind of thing would be resolved?

A Well, as far as I know they had -- We had surveillance procedure forms, and the surveillance group would send any sheets that come back completed, they would go to ISI, In Service Inspection, and an engineer would look at the data and evaluate it.

What he gets is just the minimum information, you know. And -- That's all. As far as the QA is concerned, that's all I know about.

Q Was there an area that was left out from your training in the Met Ed program on Auxilliary Operator and Control Room Operator or was there some thing discussed along these lines of reporting or fixing up things which appeared to be incorrect?

A No, I never -- We never were told to fix anything up, but they told us to get one anyway you can.

Q You get one meaning what?

A Meaning a leak rate.

Q Okay. Are you aware of the recent I think it was Friday Press Conference that the Director of the Division of Inspection Enforcement held Friday in which 155 thousand dollars in fines were levied against Metropolitan Edison?

A Uh-huh.

Q Were you aware of the fine that the NRC would have levied on Met Ed with regard to that particular tailpipe?

I would like to introduce as Exhibit 1205 a letter written by Victor Stello to Bob Arnold, Metropolitan Edison, on their findings, and I would like to draw your attention to the item of leakage from the safety valves and the tailpipe temperature.

The cumulative civil penalty for that one item alone would have been 630 thousand dollars, which amounted to a penalty of five thousand dollars a day for every day that they were not in compliance on that item.

This is the letter, and this is the

item over here.

(Whereupon, Exhibit 1205, a letter, was marked for identification.)

A This is quite stunning.

Q I don't know if there is more that can be said, but apparently the NRC has expressed their thoughts about this particular incident, and we feel it to be an extremely serious event, but I think you have sort of explained the way in which many people at Met Ed might have viewed this tech spec violation, or is it an operating procedure violation as opposed to a tech spec violation?

A It is an operating procedure violation, I think, rather than a tech spec violation.

MR. ORNSTEIN: May we take a break for a few minutes?

(Whereupon, there was a brief recess in the proceedings.)

(Whereupon, the proceedings continued as follows:)

BY MR. ORNSTEIN:

Q Back on the record again.

You had mentioned the fact that you were at the Lynchburg simulator at the time of the Three Mile Island accident on March 28, and I gather that was part of your requalification training.

Now, were you slated to have your license reviewed fairly shortly?

A Yes.

Q Was there a particular renewal submittal date that comes to mind?

A No, that's usually handled by the training department as far as the renewal submittal date. I know that my license would have expired the 19th of February or the 19th of October of this year.

Q Were you doing satisfactorily well in the requalification training, or were you having problems with it which might have impaired your receiving the renewal?

MR. SMITH: I have a little trouble with that. Off the record.

(Whereupon, there was a discussion off the record.)

BY MR. ORNSTEIN:

Q Can you repeat the last question, please?

(Whereupon, the Court Reporter read back as follows: "Were you doing satisfactorily well in the requalification training, or were you having problems with it which might have impaired your receiving the renewal?")

BY MR. ORNSTEIN:

Q Let me qualify that. Prior to March 28, 1979.

A No. I thought I was progressing satisfactorily.

Q You were not in a category, in a training program where you were deficient in areas and had to make up certain lectures?

A Not that I know of.

MR. ORNSTEIN: Off the record.

(Whereupon, there was a discussion off the record.)

MR. ORNSTEIN: Let's go back on the record. I have no further questions at the present time.

Does your attorney, Mr. Smith, have any questions?

MR. SMITH: No, I don't think so.

MR. ORNSTEIN: In conclusion I would like to say that this is an on-going investigation, and although I have completed the questions that I have for today we may need to bring you back for further depositions.

We will, however, make every effort to avoid having to do so, so I will now recess this deposition rather than terminate it and just want to thank you for your time that you spent with us today.

(Whereupon, at or about 8:53 o'clock p.m., the deposition was concluded.)

W Late Happening America
8PM 3/24/80 Channel 9 WOR NY

Bob Arnold

Peter Bradford

Steven E Kraft - EEL

Fan Kaufman

Ed Houser

New equipment installed
in TMI-1 is of poor quality
Do yr wonder why CRO testimony was not fully sweet.
Cong Congressman Toby Moffett
Moffett is Chairman of House Subcommittee
on Environment, Energy & Nat. Resources
Direct Rent - Will tell you during coffee

Sam Alexander

WHAT'S HAPPENING AMERICA
3/24/80, 8:00 PM, WOR-TV, CHANNEL 9 NYC

SHANA ? : ... Tonight three stories. An exclusive look at TMI, one year after.

HARTMAN : I thought it was an accident ~~waiting to happen~~ waiting to happen.

SHANA ? : ~~Hal~~ Hartman, Senior CRO tells how he covered up what really happened inside that nuclear reactor.

HARTMAN :

TO: T. MARTIN
FROM: W. MARTIN

Three Mile Island Tape

Hartman: I wanted to make sure that the plant would respond the way I was taught and in the way my understanding of things would allow it to. But every day I went in, it just got worse and worse. I told my wife over a year ago that I thought it was an accident waiting to happen.

Reporter: That opinion doesn't come from any hack of the shop apprentice, but from a senior control room operator here at Three Mile Island. In the first televised interview with one of those who operated the control panels, Hal Hartman says that six months before the accident, he had been warning his supervisors that pipes would break, operation procedures were being violated, and essential safety equipment would fail when the plant went through a sudden change in voltage output, known as a transient. And for his safety concerns, Hartman was harrassed and told that he'd better shut up or be fired.

Hartman: Everything went wrong. It was a lemon. Unit 2 was a lemon.

Reporter: Did you ever have any fear in operating the plant?

Hartman: Every day I went in, I was afraid. I was very apprehensive about operating the plant, especially in the later days. Uh, later days, I mean the last year or so. Just didn't know what was going to happen while I was on shift. Unit 1, it's a Mercedes Benz. That Unit was, is fantastic. Unit 2 is a '59 Rambler. It was just, you know, two sides of the coin. Unit 2 was the tail.

Reporter: Just how important are these safety systems that Hartman is concerned with. In the movie The China Syndrome, Jack Lemmon plays a role similar in responsibility to Hal Hartman's and he explains:

Jack Lemmon: In anything that can ever does, there's an old law out of MIT, right? Well, that's why we have what we call redundancy in depth. For that reason back up systems, backup systems,

to back up systems. You were there. Even with the faulty relay, even with the stuck valve that system worked.

Reporter: Sounds good in the movies, but these safety systems could have prevented the accident had they been functioning properly. Hartman says that part of this system was deliberately tampered with and he also says he was the one who did it.

Hartman: The primary leak rate was, uh--every three days we had to determine RCS inventory basically and we would determine it for a one hour period how much water we put into the system versus how much water we detected coming out. If the difference was more than a gallon per minute, the Nuclear Regulatory Commission has a technical specification that said that greater than one gallon per minute unidentified leakage was unacceptable. Uh, there in the later days, we had leaking safety valves and we had a tough time getting a leak rate. We had a tough time getting the computer to print out less than one gallon a minute. We had a tough time getting a hand calculation to come out less than one gallon a minute. There were certain things we could do to make it less than one gallon per minute.

Reporter: What did you do?

Hartman: There were certain things; like something simple like adding hydrogen to the make up tank, its a gas, to prevent oxidation in the coolant pipes.

Reporter: Did you ever fix the statistics?

Hartman: I didn't do it very often. I did it only if I was watched very closely and was told that I had to have one by six in the morning. It was a dire situation;) I avoided it. Normally when I was assigned the task of getting a leak rate, I would just say I couldn't get a good one, you know, I'll try again later.

Reporter: Why did you do it?

Hartman: We had to get it done. I was told to do it, not a good one.

Reporter: And you knew it was a violation of the NRC regulation?

Hartman: Uh huh.

Reporter: Did you ever have discussions with other people at the plant about this?

Hartman: Yeah, my shift supervisor Bernie Smith.

Reporter: We spoke to Smith outside a Middletown restaurant and asked him if Hartman had told him about the plant design and operation problems..

Reporter: Did he ever express these to you?

Smith: Yes he did, yes.

Reporter: And were they justified?

Smith: Yes they were.

Reporter: How come nothing ever got done on those?

Smith: Well, you say nothing got done. That's not really true, ok in other words you're always working on better design, you know, and to fix design deficiencies you have.

Reporter: Hartman's complaints are not just with the design deficiencies there. He claims that at the most critical period of the reactor's life, when it reaches its heat producing strength, operators inside the control room tampered with that data.

Hartman: I remember this one particular incident, uh, I was making the start up and I went critical less than a half a percent from where we should have gone and when we went critical, I immediately took the rods and inserted the rods. As soon as I inserted the rods, the shift supervisor told me uh "what are you doing?" I said "we went critical 28%, my estimated critical position was 68, my minus a half percent position was 32%, I went critical 4% too early, and to me there is something wrong."

Reporter: In testimony given to the Nuclear Regulatory Commission investigators, Hartman stated that he was told to continue the plant start up even though this would violate the procedures. He told the NRC investigators, (quote) "They redid the numbers and somehow they fudged them." And why did they do it?

Hartman: They wanted to make money. They had to get that plant to 15% power and they couldn't do it with the rods at 1% shut down position.

Reporter: How important is that? Nuclear critic Bob Pollard of the Union of Concerned Scientists explains:

Bob Pollard: I think those are further examples of the practice that is prevalent in many utilities operating nuclear plants. They

will ignore problems to the point where the operators become accustomed to them. In the case of estimated critical positions, this is an important aspect of operating the plant safely, to try and predict exactly when the reactor will go critical. If they are then falsifying those records, it reflects an attitude of being more interested in operating the plant rather than being interested in the safety of the public.

Reporter: Dudley Thompson of the Inspection and Enforcement Division of the Nuclear Regulatory Commission said that if Hartman's story is true, it could mean heavy fines on Metropolitan Edison. Already the company has been fined $155,000 for safety violations found after the accident, but Smith said Hartman's design concerns were not serious and a Company Vice-President pictured here with President Carter during last year's accident agrees:

Vice-President: I would say that the TMI Unit 2 has design concepts that are somewhat in advance of the design of Unit 1 in terms of the control room and in terms of the secondary plant installation. TMI Unit 1 has operated very well for us. I think if we're able to recover TMI Unit 2, we'll find that it has the capability to operate in a similar vein.

Reporter: Why didn't the Inspection Enforcement Division discover some of the findings we have found.

Bradford: I don't know the answer to that. Without knowing those findings, those people, whether they were interviewed, uh, I just don't know.

Reporter: One reason Bradford doesn't know is that the findings contained in the investigator's report never reached his offices. As one of the investigators told us, it seems to have "disappeared." As a result of other similar cases, Presidential and Congressional Committees have questioned whether the NRC can effectively regulate nuclear energy. And Bradford even wonders whether nuclear energy is safe.

Bradford: "Well, that always comes down to the question of what you mean by safe. If your standard is compared to driving a car, yes, uh. If your standard is can I give you absolute assurance that an accident as serious as Three Mile Island won't happen someplace in the country next year, the answer is no."

Reporter: Six federal and state committees have studied the accident at Three Mile Island and they all have agreed that the plants need to be redesigned, [illegible] and operated more safely. But the changes proposed by these committees raise serious issues which are very sensitive to representatives of the nuclear industry. The Kemeny Commission also raised a number of questions relating to the design of the plant. They have cited such things as confusing panels on the control room. Epri has, in fact, has printed a report on this. It also cited a number of difficulties with the polisher machine. Are these justified? And are these indigenous in the whole industry?

Kraft: Stop please.

Reporter: No, just answer the questions.

Kraft: I'm sorry. I'm not going to be put through that. That question I will not discuss.

Reporter: When he calmed down, here was his explanation.

Kraft: Industry is studying modifications to control rooms. The result of those studies have not yet been completed and some modifications might, in fact, be made.

Reporter: I see. And how much would those cost?

Kraft: The NRC has estimated that if all the changes to power plants that necessitated from the Three Mile Island accident would run approximately $25,000,000 per power plant.

Reporter: To save money, the plant supervisors ignored Hartman's safety concerns. Ironically, others say justifiably, the utility now has the highest repair bill in the history of the nuclear program. But rather than being heralded as a profit, things went bad for Hartman after the accident. He was forced to resign, according to reliable sources, when a company psychologist said he was too high strung to work in a security area, even though he had been working in one for six years.

Hartman: I later called Dr. Colon and asked him, I said "I thought you said I was ok when I left your office? That you would recommend me for a position" and he said he would recommend me for a position as long as it didn't involve a security area. And I said something to the effect "then you think, I'm

psychotic?" And he said, I think that you can't work in a security area. So then you're not sure what I'm gonna do in a security area. He said, that's true. I said, why? He said, because you express symptoms of hypertension and stressful behavior and you were very critical of your employer.

Reporter: But Hartman had Navy documents from when he worked as a nuclear submarine operator that showed he performed well under stress. We tried contacting Dr. Cohen, but he refused to comment. Metropolitan Edison also refused to comment on the Hartman case. Had Hartman's concerns been heeded, the accident might have been avoided. And besides the monetary loss to the company and the public, there was personal anguish experienced by the workers who absorbed the radiation. One such person is Tom Kaufman, an auxiliary control room operator at the plant. The amount of radiation he has absorbed since the accident has scared him.

Kaufman: I know it is a physical possibility that a photon at the right place at the right time could cause genetic changes, and that could cause changes in future generations.

Reporter: Kaufman's remarks have special significance for Ed Hauser, the chemistry foreman who received the highest radiation dose from the accident, nearly reaching the NRC yearly limit in a job he performed in less than one minute. Today, Hauser receives regular medical check-ups. But he was, and he still is, scared.

Hauser: I was sort of scared and mad really, because it's my job partially to know better than that I did. I should have taken more precautions, but I was, I guess, just too involved in getting the sample to...and when I found out we had taken our dosimetry out and had it read and they brought it back and they told me it was a 4.1 REM and I thought gee, I've done it. I knew I had violated our procedures and every thing like that, but I mean it was an emergency and everything, but I just sort of felt, you know, that was quite a bit to pick up at one time.

Reporter: How long was your hair contaminated for?

Hauser: Well, from March 29th one... it was sort of a funny thing because my hair was the last thing to become clean or uncontaminated, and I was waiting for that to happen so that I could get a hair cut. You know my hair was getting quite long and I imagine it was probably around six weeks until it was completely back to normal, or background.

Reporter: Your hair was contaminated for six weeks?

Hauser: About six weeks.

Reporter: Besides his hair, he tried various soaps to get the radiation off his fingers but the detergents failed and he was desperate. Did you try any other way of getting the radiation off your finger?

Hauser: Well, that night at the 500KV substation, before I went home the first time, uh, there was some small pieces of sandpaper there and I had been rubbing them on my fingertip and trying to get the dose rate down on it.

Reporter: You were trying to sandpaper your skin off?

Hauser: Yeah, I was sandpapering just the pad off my finger.

Reporter: Did that work?

Hauser: Well, it worked, but it also, I think it took away my fingerprint.

Reporter: We're now nearly a year later from all of this, have you had time to reflect on it a bit?

Hauser: Yes. I've looked back on it just about every day and there's always things you'd do differently and you know, it's very easy to be a Saturday afternoon quarterback and you know, after the fact. You know, it's very easy to say what you would've done.

Reporter: The potential danger hasn't ended. Radioactive gas trapped inside the containment building is being vented into the atmosphere, despite strong community protest. Unit 1, the undamaged reactor is now being prepared for restart, sometime later this year. But, according to one CRO we spoke with, he told us some of the safety equipment being installed in that reactor is of poor quality. When we told this to an NRC Safety Expert, he said "it is unreliable, but the industry just hasn't designed anything better yet."

This is Ira Rosen reporting.

SHANA ? : Do you wonder why Hal Hartman's testimony was not fully explored by the NRC. Well so does Connecticut Congressman Toby Moffett, and Moffett is Chairman of the House Subcommittee on Environment, Energy and Natural Resources. As a direct result of Reporter Rossi's investigation, the House committee will hold new hearings soon, and we'll keep you posted.

A5

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of:

IE TMI INVESTIGATION INTERVIEW

of

Harold Hartman
Ex-Control Room Operator

March 26, 1980
(Date of Interview)

April 15, 1980
(Date Transcript Typed)

3 and 4
(Tape Number(s))

NRC PERSONNEL:

Keith Christopher, Investigator
Thomas Martin, Section Chief, Reactor Project Section 3

CHRISTOPHER: Today is March 26, 1980, the time is 8:08 p.m., this is Keith Christopher and I am Investigator with U. S. Nuclear Regulatory Commission assigned to Region I, King of Prussia, Pennsylvania, this evening we are located at RDI Columbia, Pennsylvania which is the residence of Harold Hartman. We are here to conduct an interview of Mr. Hartman who is an Ex-Control Room Operator for Metropolitan Edison at the Three Mile Island Site, at this time I would like to identify one other individual in the room who is present for the interview.

MARTIN: Tim Martin, NRC Region I, Section Chief, Reactor Projects Section 3, Reactor Operations Nuclear Support Branch, Region I.

CHRISTOPHER: Before turning on the tape, we discussed with Mr. Hartman this two page memo and there are several items which we would like to make a matter of official record. This memorandum covers the scope and purpose of our investigation and goes into the degree of rights the individual has who is being interviewed. On the last page there are several questions which I would like to get your response to on the tape, that is number 1. Do you understand the above which addresses the two page memo?

HARTMAN: Yes I do.

CHRISTOPHER: Okay the second questions reads, do we have permission to tape this interview?

HARTMAN: Yes.

CHRISTOPHER: And thirdly, do you desire a copy of the interview?

HARTMAN: Yes I do.

CHRISTOPHER: Okay, let it be noted that we will attempt to get your transcript of the tape as soon as practically available and we will also provide you with a copy of the tape when it is made. Finally, my question to you is, do you desire that any other individuals be present during the course of this interview?

HARTMAN: No I don't.

MARTIN: Harold the first thing I'd like to look into is the estimated Critical Position of concern relative to being critical below the 0.5% Δ K/K estimate. First I'd like to clarify if we can the approximate date that is occurred.

HARTMAN: To the nearest my recollection, it was probably somewhere between October and November of 1978.

MARTIN: Okay do you remember what shift that might be on?

HARTMAN: Yeah, I believe it was on the mid shift, so we were ready to do the startup when I came on shift and the time frame would be anywhere from midnight until 2 or 3 in the morning, the startup could occurred.

MARTIN: How can you describe your actions during this startup?

HARTMAN: Well I got the ECP following the first Criticality Procedure to the letter and I had my two numbers in mind, I think lower delta-K position was 32% on group, group 6-7, the upper limit was somewhere around criticality, I forget where it was, it slips me I believe it was around 52% and then the upper limit was 68% on that same group of rods, I was making the startup and commenced pulling out group 5, pulling the one over M and as I recall I do remember seeing the one over M plotted, it started coming down like, you know you can, the one over M plotted tells what's going on inside the core, and normally during startups of this type we don't really stop and wait for the neutron levels to equalize before we get our neutron counted at various points but it just seemed to me the points that we were getting through the rod withdraw indicated criticality quite a bit lower than predicated position, this was after the fact by the way, I didn't look at the one over M's, another person would stand back and he would plot the one over M

and if he saw any trouble then he'd generally alert the operator that was on the rods and I continued pulling rods and I was watching for group 5 to get to the top, the group 5 rods were at 100% withdrawn position when group 6 and 7 are at 25%. So I was withdrawing the rods and I was waiting to insure that all the group 5 rods had in fact hit the out limit and stopped and it was about that quick that I got a startup rate inhibit alarm on the diamond control panel and also up on the main annunciator panel and I looked at my rod position, I had a 3 dpm startup rate and I think it was 3, we would have been in a source rate and I can't remember if that set points 3 or 2 but any rate I was over the alarm point to the point where I was and I immediately took the rod and placed the switch to insert and I was going to, I was ready to drive the rods down to the all safety rods out position, in other words all the regular rods were inserted into the core which insured by a former calculation that the reactor was at least 1% shutdown. I started to do that and my, the Shift Supervisor was Brian Mehler at the time, came up to me and said what are you doing, you know this isn't a quote from our context or anything what his exact words were but he told me basically to stop rod motion, go critical, take it to 10 of the minus 8 amps and then we'd redo the ECP and he had two other guys working on it, I think Ray Booher was one of them and I think Dick Hoyt was the other that recalculated the ECP and we proceeded from, the best of my recollection we proceeded up to 15% power and then we got relieved, I'm not sure if we took the turbine on the night or not but I know we got to 15% power.

CHRISTOPHER: Did you say that Ray Booher and Dick Hoyt recalculated the ECP?

HARTMAN: I assumed that, okay I was really concerned with the monitoring of the panel, I'm assuming that they were the ones that did the recalculation because Ray Booher was the other Control Room Operator in the room at the time and Dick Hoyt was a Shift Foreman and only the two licensee's will get together and perform, I can't remember if we had a trainee in the Control Room at that time or not that might of helped.

CHRISTOPHER: Did you discuss the incident with either Dick Hoyt or Ray Booher in which you felt that the procedure was wrong that was done?

HARTMAN: Again I can't really remember talking to them specifically but I know I questioned Brian Mehler, I questioned him, I said look this is wrong, I said I'm supposed to be doing this right now and we're supposed to be looking for the trouble, what's going on, why we went critical to soon and I can't remember his exact words again but generally, "well we'll just recalculate."

MARTIN: Would you repeat for us the specific direction that you were given by Brian Mehler when you were inserting the rods to shut down the reactor?

HARTMAN: No, no, stop, that's his closest quote I could get, no, no, stop, take it 10 to the minus 8. I don't want to say that that is a direct quote but that is the essence of what he told me to do.

MARTIN: Subsequent to that you stayed out at 10 to the minus 8 and at that point you would log things in your log.

HARTMAN: Yeah, according to our procedure we have to log the time we went critical, the rod position in all the groups, the boron concentration and I don't know if xenon is in there or not.

MARTIN: It doesn't matter, did you log those in your log?

HARTMAN: Yes I did.

MARTIN: Subsequent to that the ECP was recalculated I believe, do you know what thing was found in the error that the ECP was off?

HARTMAN: Well I can't remember specifically, but being deducive about the whole thing, the only thing that can change, because I know we calculated good ECPs with the curves, rod curves that we had and boron curves we had were adequate, in fact, the curves that we had in the back we calculated ECP, no problem, we had come up with one that was good, the only thing that I know of is that during this time we had

been having this safety valve leaking problem and we were distilling the water inside the pressurizer so that boron was always constantly in transit in the RCS system so I just assumed that they, that we came up with a diluted, a diluted reactor core cause all the boron was now in the pressurizer, so I assumed that that's what happened and I can't remember if I went and recirculated the pressurizer to equalize the boron again or not, I don't really know, but I believe it was the boron that they changed.

MARTIN: How can we identify the records for that particular startup, was there anything in the records that I could say Ha Ha that's it, when I reviewed the Control Room Operator's Log or any other log that might be available?

HARTMAN: Well the fact that I remembered what the critical position was in that I was the only one I think, that was the only startup I believe that I had made myself in the Control Room. I had been involved in others during the low power physics program and stuff like that but that would have been to soon in the time frame, if this would have been on actual startup taking it probably during the power escalation, somewhere between 15 and 90%, I don't think we were commercial at that time.

MARTIN: Why wouldn't the error appear in the records?

HARTMAN: Well I'm not sure why it doesn't appear in the records, I think there might be, I can't remember now, some shifts log when chemistry department was requested to do a boron concentration for us, they would normally phone it up and it would enter the number on our status board. I don't know if I did it all the time but I tried to make it a practice to record that boron sample in the RO log whenever it came up, you know sample says RCS boron such and such. I may have made such an entry that evening, they would have chemistry logs that would log the time the sample and the results, I'm not sure, do you have a copy here of that procedure for the Approach to Precriticality and ECP procedure?

MARTIN: Yes I do and let me get a copy of it here, this is the Approach to Precriticality and this is a reactivity balance which has an ECP calculation procedure added.

HARTMAN: What I am trying to find is a time period.

MARTIN: I think you'll find that there has to be 4 hours, it's only good for four hours and it has to be recomputed.

HARTMAN: Another way we might be able to find this, as I remember now, okay we used to bleed and feed to the proper boron concentration we would have a boron number now and where we wanted to be at criticality and then we would deborate to that value and once we got to that value then the startup could continue, now if we were suppose to go critical at 52% and we went critical at 28% that on the rod curves is quite alot of reactivity which would correspond to a large rod change, at least 100 dpm, and if somebody put the pressurizer on recirculation to get the boron back into the RCS, it was just kinda recirculated back, then that would tend to bring all the rods out and if you could look at rod motion verses time and compare it to what you would have that there is very little significant xenon buildup between 0 and 15% power in an hour or an hour, two hours, so that what I'm saying is that you should have a large outmotion of rods at some time after that startup that would show that the boron concentration was different and that they did something to rearrange it, because once the core is in a condition and you don't do anything to change that condition, this reactivity balance is going to tell you what is going to go on in there, if it's worked before it is going to tell you and you know you can kinda fool them on paper but you can't fool the reactor, the reactor is going to do what is knows it has to do, the reactivity balance is kinda its backup. I always kinda thought of it has having some positive weights over here, trying to start the plant up and you have negative weights over here, I

don't know they just had a misbalance, I mean they had the weights there but they had a little more rods than you had boron in this hand holding it down, so I think perhaps that might be a way to approach would be the...

MARTIN: Hal you mentioned two of the names that were in the Control Room at the time that this occurred, was there anyone else present?

HARTMAN: I think I mentioned Dick Hoyt and Ray Booher and the other man was, he was a Shift Supervisor Brian Mehler.

MARTIN: Were you under any pressure to change the information that you recorded in your log?

HARTMAN: Well what I recorded in my log was what we actually figured the second ECP from.

MARTIN: Okay you say you recorded what you had computed in ECP or did you record what you actually got?

HARTMAN: What we actually got.

CHRISTOPHER: Hal as a point of clarification for me, I'm reading from the transcript of the Ira Rosen interview and Mr. Rosen indicates that you were told to start the plant up even though this would violate the procedures, did you, did you mean to say that Brian Mehler said it, recognized that it was in violation of the procedures and told you to do it anyway or is this Mr. Rosen interpretation of what you said?

HARTMAN: Well sometimes he does say things that you know I wouldn't state in that fashion.

CHRISTOPHER: This is Mr. Rosen?

HARTMAN: Yeah, I could take it for different meaning knowing my background and I think what he tries to do is put it from my level to the general public. Now what was his statement again?

CHRISTOPHER: If you look on the bottom of page 3.

HARTMAN: Yeah, he stated that he was told to continue the plant startup even though this would violate the procedures, yes.

CHRISTOPHER: My question to you is, is this what Brian Mehler said to you, continue the startup even though this would violate the procedures?

HARTMAN: Yes.

CHRISTOPHER: In other words it was clear to you at the time and to Mr. Mehler he knew at the time he was violating the procedures.

HARTMAN: Yes, I'm sure he knew that, he was a Senior Operator.

CHRISTOPHER: I understand, but is this what he said?

HARTMAN: Oh in this, on this thing here, that's what I, I would interpret that as stating as the way you expressed it to me, that Brian Mehler told me to start up the plant even though he knew and I knew that we were in violation.

CHRISTOPHER: You have no question in your mind that you can recall him saying something to that effect?

HARTMAN: No question.

CHRISTOPHER: Okay.

MARTIN: Who did you inform about this procedure violation besides talking it over with Mr. Mehler?

HARTMAN: Well I probably talked about in the initial, would have been an issue with Bob Marsh I had mentioned it and of course Ira and I suppose Ray and I discussed it and Dick Hoyt you know I just mentioned I said you know I don't like to do business that way, you know I am sure I expressed my displeasure to both Ray and Dick Hoyt.

CHRISTOPHER: Do you recall what their response was to you, either Ray Booher or Dick Hoyt in regards to this procedure that had been completed?

HARTMAN: No, I can't remember.

MARTIN: Keith, I have no further questions on the criticality unless you have some.

CHRISTOPHER: Not at this point, I don't think so.

MARTIN: Okay, Hal I'd like to move on to the emergency feedwater surveillance, and first I've shown you copies of the procedures for the turbine driven emergency feedwater pump operability test and for the motor driven emergency feedwater pump test and just for our clarification that it's my understanding that it was the motor driven emergency feedwater pump surveillance that was causing the problem.

HARTMAN: That's as I can recall.

MARTIN: Now in that particular procedure it is the reference values and the acceptable values for the sunction and discharge and flows for the pumps that the reference values were changed frequently to make the test come out acceptable, is that correct?

HARTMAN: Uhm uhm. (Yes).

MARTIN: Okay, was the problem experinced early in the plants life or much later in the plants life?

HARTMAN: I think as I recall we generally had alot of problems with it from the time we started to do the test and that would have been oh I guess even prior to the safety valve problem in April, we started doing, I guess once we started hot functional testing.

MARTIN: Alright, this particular surveillance test is run once a month, were we still experiencing problems with this reference value as late as 1979?

HARTMAN: As I can recall, yeah we just had problems with it you know and I know that alot of times we'd come up with data at night, we used to try to do them on the mid-shift because nothing was going on, you didn't have many people around and we'd do it at night and come up with unacceptable values and I think to the best of my knowledge the Shift

Foreman would go down with him and try to get the reference values and they couldn't meet the acceptance criteria or the flow would be wrong, so he'd bring it back up and set it on the desk and says hey lock you know this is what we got, I don't know what we could, you guy's try and run it and then the day shift would take it and they would see what they could do with it and after a few days it would disappear and then apparently you'd just assume that it was done and then it would surface up somewhere in the completed surveillance files as being completed and within, the next procedure would always have a little TCN stating the new reference values.

MARTIN: Hal for clarification the TCN is a Temporary Change Notice for procedure which would actually change the reference values?

HARTMAN: Yes.

MARTIN: Alright Hal lets continue, what was your opinion why this test wouldn't come out the same twice since we'd indicated or you indicated in earlier interviews?

HARTMAN: I don't know really I was baffled, I just didn't know, you can only speculate on stuff like that, I'd hate to even make a speculation except the fact that maybe one time the tank would be half full and they could meet this one particular thing but then it would throw some

other parameter off or I don't know just the way perhaps a guy would throb a valve to get it to come in, little tricks of the trade so to speak but not everybody has the adeptness to come up with.

MARTIN: Again your indicating though that you don't know for a fact that this is the reason.

HARTMAN: I don't know, I don't really know why that, I don't really know why it didn't pass.

CHRISTOPHER: Did you Hal discuss this problem with any other operators on your shift in an effort to find the solution and if so what was, were there any common grounds that you found for this happening or any common way that you as operators for that shift determine that you would use a method that you would use to come with appropriate figures?

HARTMAN: No not really we did some discussions with it but you know generally we'd just come up with a dead end, we just couldn't do it, we just settled with data that we had collected and you know someone else would try it and apparently they would get some good data or get it so that the engineers had to look at it and reevaluate it.

MARTIN: Who changed the referenced values and what explanation were you provided for those changes?

HARTMAN: I think it was the ISI group, I think Diane Shamus was one of them, I don't really know for sure and there was another guy but they would look over this stuff and reevaluate it, come up with another set of numbers and then they would just say, I don't even remember what the reasons were but we would always end up with some new reference values and I didn't know why really.

CHRISTOPHER: Do you have any reason to believe that they were manipulating the figures just to get accurate reference values or do you have any bases to believe that they were doing anything wrong, that they were, so called fudging the statistics?

HARTMAN: No I don't have any bases for that.

CHRISTOPHER: Okay. Hal do you personally feel or do you know any of the operators who felt that you were either professionally or through pressure from management being forced to fudge calculations in order to get correct records, do you feel that there was upward management pressure in order to obtain these?

HARTMAN: I'm not sure I understand. What level was upper management?

CHRISTOPHER: Well to me management would be from my Shift Supervisor on...

CHRISTOPHER: In other words did Dick Hoyt, did he imply to you or directly say to you that if you did not come up with a good reading that you were going to have a problem or did you feel that there was going to be a problem?

HARTMAN: No he knew me better than that, cause he knew, I knew when I was right and when I was wrong and so he never pressured me into anything like that.

CHRISTOPHER: Did you get this kind of pressure from any of the other management personnel?

HARTMAN: No not really, I mean you know there's several times in the leak rate procedure where they'd say get a good one, you know, I guess we'll talk about that leak rate later but you know there's one of them, I don't know what would of happened if I, you know if I wouldn't of gotten a good one but like I said before I did'nt like to do them, I'd do them all night and if I got a good one I'd sign it but you know I'd fudge it as seldom as possible, as seldom as possible I did'nt like to do it, I don't know what would of happened if I'd have said Bernie I just can't get another one, I can't get a good one, he says well I know, I don't know what would of happened if they would of come down to the line work, you know I wouldn't do it again.

CHRISTOPHER: Hal you just said you fudged it as little as possible, can you give us, be a little more specific in terms of what you mean, it terms of when you fudged it and how you fudged it and what prompted you to fudge it, fudge these records?

HARTMAN: Well I guess it was more, you know more peer pressure than anything, you know everybody brags that there shift gets leak rates all the time, you know well how do they do it and you rack your brains out trying to figure out, you know, how how you can, how they can come up with a leak rate and you can't come close and you just, you know, then you start to devious processing, you try your little ways.

CHRISTOPHER: Just to be clear do you differentiate management pressure from peer pressure or to you are they synonymous?

HARTMAN: I think there pretty much synonymous because as far as I can remember all the Shift Supervisors thought their shift was the best, you know and it's that way in any power plant and so from the Shift Supervisor down there's, that's the peer group that I'm talking about really, you know, how come you can get a good leak rate and I can't, my guy's are just better than yours, you know but...

CHRISTOPHER: Do you think that is a great problem in the operation of the plant or do you think that it is inherent in any type of situation where your talking three distinct shifts doing the same job?

HARTMAN: I think it's an operational problem, we obviously couldn't get one and somehow we did get them, I don't think there was a leak rate gotten legally in, at least I know prior to three months to the accident, it wasn't a good one I don't think.

CHRISTOPHER: And you based that on what, Hal, pardon me but I'm not a technical expert so you'll have to give a little more to help me.

HARTMAN: Yeah I used, I had a little thing I did was just add a little nitrogen to the makeup tank or hydrogen to the makeup tank and it was enough to send the level, the level instrument a little screwy and it would indicate slightly higher than, slightly higher than, or maybe not indicate on the chart but to the computer it would show that it was a little higher level in there than there was before and then of course if you don't have that makeup tank level lost, then you haven't leaked out as much water and the thing would, might print good.

MARTIN: Hal let's get into the technical area, which leak rate tech spec requirement are we referring to that was difficult to pass?

HARTMAN: That was the 1 gallon per minute unidentified leakage.

MARTIN: Okay, we had talked about the safety valve leakage being bad, how does a safety valve leakage have an effect on this unidentified leakage rate, since, if I remember correctly safety valve leakage would be included in RCDT level changes?

HARTMAN: Well I remember a couple of months before the accident that they had, we had been trying to get good leak rates from the existing computer program. They tried making a model of the drain tank in the computer, taking a voltage from the level transmitter on the tank itself, they made a model and converted it to a signal usable by the computer, so that now we didn't have to go down and punch in the voltage, normally we'd have to go down and read the voltage coming out of that transmitter, come back up punch the leak rate in, punch the voltage in and then wait an hour, when it punched out go down and get the voltage again, come back up and then the computer would take it away and that's how the drain tank leak rate was figured by the computer. Then, like I said later they went and they just picked, they made a way to pick those voltages identically the same time as they pick all the other parameters at the beginning of the hour and that I think they tried and as long as, they still didn't come out because I remember we were having the problem before, very slightly before the safety valve started

to leak bad and we still couldn't get them with that and then I think after we went commercial they tried another particular program, I don't know what changes that did, in fact I'm not even sure they really implemented that program, I can't tell you that for a fact, the new program had been implemented. I know I tried various times doing, doing a leak rate by the hand calculation and I can't remember if it came out or it didn't, I think it came out but just barely, so it could have been in the computer program, it could have been actual leakage, I don't really know but nonetheless nobody did anything to find out why.

MARTIN: Hal how frequently was the RCS inventory test run?

HARTMAN: Well it was supposed to be run every three days but since the reliability of the computer, in other words sometimes it would print good and sometimes it would print bad, they never let you go up to the last hour or last day even to try to get another good one so actually it was part of the control routine, it would just punch a leak rate until you got a good one and sometimes it might run four, five a night, sometimes it wouldn't come out at all.

MARTIN: How were the unacceptable results handled, the computer prints out an unacceptable result, what to you do with it?

HARTMAN: Oh you had to throw that away, file that in file 13 and you just didn't leave those things laying around.

MARTIN: File 13 is the trash can?

HARTMAN: Trash can, right.

MARTIN: Who would do that Hal?

HARTMAN: Oh I would or I'd just rip it up and say here is another bad one or the second one I'd get just to show them that there's what we get, throw it in the Shift Supervisor, Shift Foreman's office and they would do it.

MARTIN: What was there rationale for crumbling these things up, it could of been good leak rate?

HARTMAN: I don't know, I really couldn't tell you except that I think that they got pinned on this 1 gallon per minute thing, you know, it just can't be greater than 1 gallon per minute, if they got anything greater than that, then they said no that's no good, they can't use it and then they would throw it away and I guess somebody, somebody made mentioned one time that the NRC found an old leak rate that was like,

you know, 10 gallons per minute unidentified, found why, you know started asking questions and then so after that they said we got to keep these things, you know, throw it away, you can't leave these lying around.

MARTIN: Hal when would hand calculation be done, what keyed you guys into doing hand calculations?

HARTMAN: I don't know, maybe it was just, I don't know the real reason, if I have to remember back I would say it would just be for something different, for something different to do, just to try and to get one to come out right and you know sometimes they would, sometimes they wouldn't but normally, alot of times they might go in to a, in to a barrage, or not a barrage it would be like a, it would be the fad of the week is to get an RCS inventory by hand but that would involve going out and collecting little cylinders of water to determine the leakage out of individual valves and things like that, in fact we did that and as I recall I think once we started to do that then we would get them every once in a while, we'd get good ones but then we'd could add that in on the typer itself as unidentified or identified leakage and normally sometimes it would come back down again, it did not always came down below.

MARTIN: So basically once we started identifing some of these leakages and demonstrated that they were from components that would not effect the leak detection system and the safe or Shift Supervisor has to make a determination that they are not unsafe, that you could subtract these off and in that way you were starting to get good leak rates.

HARTMAN: Uhm uhm, yeah, as I recall.

MARTIN: Hal when they finally, when they got an unacceptable leak rate either by hand or from the computer did that kick them into an action statement or did they simply throw it away and say we still got the rest of the 72 hours to get a good one?

HARTMAN: It's from what I understand it didn't kick them into an action statement at least they didn't treat it that way.

CHRISTOPHER: When you refer to they Hal, who are you referring to, using we and they?

HARTMAN: Well we operators in general and they meaning because I use to work with them, I've come to...

CHRISTOPHER: Okay, I just what to clarify what we're talking about.

MARTIN: Hal can you tell me how the data was fudged, now you indicated that one of your tricks that you knew about was to increase the hydrogen over pressure in the makeup tank?

HARTMAN: You could, I remember one way that you could do it would be to increase the voltage reading to the drain tank.

MARTIN: When you say increase the voltage reading this what you told the computer the voltage reading was.

HARTMAN: Right you'd give the voltage reading just a little bit higher, that means you collected a little more water, or the computer thinks it collected a little more water then you actually have and then the other thing was that you would just turn on a charge makeup pump, or not a makeup pump a water waste transfer pump and just every so often you hold the makeup valve into the makeup tank, just hold that open for a few seconds, maybe once every five minutes during the test and you leak in just enough water that would kind of hold the makeup tank level up and as long as the computer only saw time 0 and times 60 so that you can add water in that time and then we'd never tell the computer that we added the water.

CHRISTOPHER: Hal these are things that you and the other operators would do?

HARTMAN: Yeah I've seen them done.

CHRISTOPHER: Was this done with knowledge of the Supervisors and the Shift Foreman?

HARTMAN: I don't know if they knew or not, tell you the truth, I really don't know.

MARTIN: Hal can you tell us who actually tried some of these tricks, now you indicated that you did?

HARTMAN: Yeah I did, no I'd rather not say because you know they might still be up there.

MARTIN: Okay, would it be during that last three months before the event, is that the time period we're looking at?

HARTMAN: Yeah I'd say because we had an awful time.

MARTIN: If the supervisors were not aware of this and there only pressure was hey we got to get a good one, why did you guys do it?

HARTMAN: I don't know, except that if we didn't get a good one they'd be down on our backs and they used to tell us get a good one, so to me get a good one means, get a good one, you know, by hook or crook.

CHRISTOPHER: Hal, who specifically told you to get a good one?

HARTMAN: Well my Shift Supervisor.

CHRISTOPHER: Which would be?

HARTMAN: I think Bernie Smith was the one most of the time.

CHRISTOPHER: Bernie Smith, when he said get a good one, did he say get a good one at any cost, I don't care what you have to do to get a good one, to me get a "good one" can mean several things, I'm just trying to qualify that phrase, get a good one.

HARTMAN: I don't want to say what he meant by that statement but I'll tell you how I took it knowing Bernie Smith, get one by hook or crook.

CHRISTOPHER: Okay.

HARTMAN: I know they knew it was going on, I don't know tnat they thought just on my shift that we were getting them good and legal like but I know they had to know these things were going on, otherwise they wouldn't of been working on the computer programs and stuff like that.

MARTIN: Hal in reviewing the transcript of Ira Rosen's report, there is a statement he says that you said "I didn't do it very often, I did it only when I was watched very closely and was told I had to have one by 6 in the morning" when you say I didn't do it very often, what are you referring to?

HARTMAN: Did I ever fix the statistics, well that was again, that was in context with this hydrogen into the makeup tank.

MARTIN: And when you say, you know...

HARTMAN: I wasn't watched very closely, what I meant was that I'd never do it during a day shift you know when there was alot of people around, that's it, you know and I even kind of hide it from Shift Foreman, Shift Supervisor so that they didn't see me, generally that was no problem.

MARTIN: What did you feel would happen to you if you hadn't done that?

HARTMAN: I don't know, I just, I guess I would of felt like a dummy because they say well how come all these other guys can get them and you can't, you know, then I would come back and I'd say well you know I don't want to fudge them and I'd keep telling them, I says I'm tired of wrestling with these, with these leak rates, I don't want to, we have got a problem here, why don't you do something about it.

CHRISTOPHER: Who did you tell that to?

HARTMAN: Oh Bernie or Dick Hoyt, that's as far as I can go, and even possibly in conversation with the Shift Supervisor, Shift Supervisor of Operations.

CHRISTOPHER: What did they respond to you and what did they say to you when you complained to them about these leak rates?

HARTMAN: Specific comments I can't remember.

CHRISTOPHER: Would you know if any action was taken because of your complaints?

HARTMAN: Well I think they did look into the fact that the computer program might be off, you know, I know that they did some work in that area.

CHRISTOPHER: That would of been who Hal?

HARTMAN: Well that would have gone from the Shift Supervisors up and then down to the computer department.

CHRISTOPHER: Let's pause for a second while I check this tape, okay, I want to see exactly where we are.

MARTIN: We just turned the tape over, the time is 9:00. Hal, we're reviewing the transcript of the T.V. reporters comments here, he's talking about defense in depth on top of page 2 and he says, sounds good in the movies, he's talking about John, Jack Lemmons response, but these safety systems could have prevented the accident had they been functioning properly, Hartman says that part of the system was deliberately tampered with and he also says he was the one who did it, what is he referring to there?

HARTMAN: No, I didn't say anything like that.

MARTIN: I think if you go onto the next paragraph, I think you'll see what he actually hooked it in with, was leak rate test.

CHRISTOPHER: Hal if you would take a minute and just read to that section of the transcript and then be able to make a comment on it.

HARTMAN: I don't know how he could have said I tampered with it and I was the one who did it.

MARTIN: So right now you don't understand his statement, is that it?

HARTMAN: That's a fact I don't understand it.

MARTIN: Let me ask you a question, did you tamper with the safety systems?

HARTMAN: No.

MARTIN: Okay, that is what is implied there and I wanted to made sure that...

HARTMAN: I didn't tamper with any safety systems that I didn't untamper, what I mean, by surveillance procedures and things like that, that we had to run, I always made sure that I lined up the systems the way they were supposed to be, in fact I used to find alot of stuff that was, that was, when I come on shift that was wrong and I would straighten it out or I'd go to the Foreman and see if there was, no this, Hartman says that part of this system was deliberately tampered with and he also says that he was the one who did it.

CHRISTOPHER: That is the transcript of what the reporter has said and it is your comment that that is not what you said.

HARTMAN: Yeah, I didn't say that, I did't say that I tampered with any safety system.

CHRISTOPHER: Do you feel that you said something else that he misquoted you in?

HARTMAN: Yeah that's what I'd say.

MARTIN: Keith you have any more on this area?

CHRISTOPHER: None.

HARTMAN: I think he's got, I think he's just misconstrued it you know that, for some reason, you know reporters glorify things and I think he glorified that this leak rate was something to behold safety, you know.

CHRISTOPHER: Hal, there is no question in your mind that you did not tell him that you deliberately tampered with the safety system?

HARTMAN: No way, no way.

CHRISTOPHER: Okay.

MARTIN: Okay let's leave that area and I'd like to next go to safety concerns and how they were handled, first I'd like to know what concerns do you remember communicating to your supervisors and management?

HARTMAN: Probably the foremost would be the polisher valves, the polisher bypass, I know we have been screaming for months and months and months, years you know, when the system was first installed, why don't they have an automatic valve like Unit 1 has and I don't know how many times the valve in Unit 1 has saved them, it's just beyond me and I know suggestions were made to them and they just didn't do anything about them, we had to put the polishers on the same dumb way each time.

CHRISTOPHER: Who were the individuals Hal that you told about these problems?

HARTMAN: Bernie Smith would be one and I know Dick Hoyt I talked to him about it, probably numerous other people.

CHRISTOPHER: As a result of you telling him of these various problems be they safety or operational problems did you see any attempt to make any corrective action in any of the areas that you talked about or would you say that the things that you told them were completely ignored?

HARTMAN: Well I don't want to say they were completely ignored, maybe perhaps they just weren't moving fast enough for me, but I did during several shutdowns see excellent opportunities for the modifications that we wanted.

MARTIN: Okay before we get to far in, I think we're getting a little ahead of ourselves, we talked about the polisher bypasses, that was one thing that you communicated to your supervisors, what I'd like to do is kind of generate a list of the concerns which you communicated to your Supervision. Polisher Bypasses was one of them, we talked previously about the ECP, that was communicated at least to Brian Mehler and you think maybe Dick Hoyt, who else might that have been communicated to?

HARTMAN: That's about it.

MARTIN: What about the leak rate problem, was that communicated to anybody?

HARTMAN: Oh yeah, Brian and Dick Hoyt they had to know, I told them you know, how are we going to get one, it always come out bad.

MARTIN: What about the emergency feedwater surveillance procedure problems?

HARTMAN: Well I didn't really feel that I had to communicate, well communicate, yeah I guess I did by just giving the procedure to Dick Hoyt and saying this all that it can do and it comes up that way all the time, I know that the other operators expressed the same concern, the auxiliary operators when they run the test that they would...

MARTIN: Okay, what form did you use for communicating this information, was it, did you write it or...?

HARTMAN: It was all verbal.

MARTIN: In other words you were just talking to the individual.

HARTMAN: Yeah.

MARTIN: Does the company have any mechanism for you to communicate safety concerns other than orally to your supervisors?

HARTMAN: I can't remember.

CHRISTOPHER: Hal, are personnel as a policy, are they encouraged to report deficiencies if they are not satisfied with any corrective action that's been done beyond their immediate supervisory level?

HARTMAN: No cause generally we didn't have much to do with the people up above the Shift Supervisor, every once in a while we see the Supervisor of Operations, he'd come in and shoot the breeze with us but as far, and we'd even make some of our problems known to him and he'd actually ask for them but I mean guys like Gary Miller you know you hardly even saw them in the Control Room.

CHRISTOPHER: Did you feel that you had an avenue to go beyond your immediate supervisors being that you were not satisfied with corrective action being taken?

HARTMAN: Yeah I thought I could go but you know I figured that if my concern is his concern then he'll go to back for me, which is what he should of done really, I took it for granted that he would do that.

MARTIN: Hal, what was your relationship to Bernie Smith?

HARTMAN: He was Shift Supervisor.

MARTIN: This is your normal Shift Supervisor?

HARTMAN: Yeah right.

MARTIN: Dick Hoyt?

HARTMAN: He was normal Shift Foreman.

MARTIN: Brian Mehler?

HARTMAN: He was just, he was an off, he's a Shift Supervisor but I think was covering for somebody, I think he was covering for Bernie for some reason and I think maybe, I know what it was, no maybe it wasn't, I was thinking perhaps it was during the refueling of Unit 1 that they might of shifted his schedule.

CHRISTOPHER: This was for an entire shift not for a brief interlude, in and out of the Control Room?

HARTMAN: No this was, no this in fact we had him for the whole week.

CHRISTOPHER: Is that the only time that you had worked for Brian Mehler?

HARTMAN: That I can recall.

CHRISTOPHER: Okay.

MARTIN: Hal when you communicated these concerns to the supervisors, was it done while you were at the plant, while you were working there or was it done in a more informal environment?

HARTMAN: Well I think we did it at the plant pretty much and of course you go to the bars in the morning after getting off and you'd talk about it, you know, but there's nothing that was, there was nothing that was discussed outside the plant that we didn't discuss inside, really.

MARTIN: Okay we were talking about actions taken relative to these concerns, relative to leak rate it appears that they did modify some computer programs because it didn't seem to be working. Did you see any changes relative to the emergency feedwater surveillance procedure that, relative to your concerns?

HARTMAN: No not really, I just, I just saw the TCNs come up.

MARTIN: What about the...

HARTMAN: I think they tried to recalibrate the eagle eyes too, it's a little differential pressure gages and I don't recall that they did anything, that they had always indicated correct.

MARTIN: What about the ECP problem, the fact that they failed to follow procedure there, was there any response to that in terms of later...

HARTMAN: Later having the same situation arise?

MARTIN: Yes.

HARTMAN: I don't no that, I don't really know how the other shifts would of handled that.

MARTIN: Why weren't some of these concerns passed to the NRC, Hal?

HARTMAN: Well I don't know, I guess I just thought that, you know I, I know that some people don't like that, you know I just didn't want to be harrassed on the job, not necessarily harrassed but you know perhaps be given a dirty job over somebody else because I was going to the NRC as a rat, so to speak, you know that's what we were, it was almost in red that you know, you guys were the bad guys and it's a hard thing to, it's a hard thing to get over, you know.

CHRISTOPHER: Hal are you saying that if you did come to the NRC were you worried about loosing your job or were you worried about just, or were you worried about being demoted, were you worried about just getting a bad reputatation.

HARTMAN: I don't know if it happened in the past but being the way I am, I felt that if I went to the NRC that you know, that they would take it personnal on me and then I would suffer the consequances.

CHRISTOPHER: Do you mean that in terms of your Shift Supervisor, your Shift Foreman would take it personally and that you would suffer the consequences or your peers would be upset that you came to NRC?

HARTMAN: I guess it's just kind of everything, a combination of everything, what did that idiot do that for, what did he go and to that for.

CHRISTOPHER: Did anyone in the management ever, this is obviously a heavy question, did anyone in the management ever threaten you with the lose of your job or the lose of pay or lose of status if you did come to NRC with any type of complaint?

HARTMAN: No.

CHRISTOPHER: Was that area even intimated indirectly by a Supervisor that if you did come to NRC you would have a problem?

HARTMAN: No.

CHRISTOPHER: Okay.

MARTIN: Hal did you feel that if you expressed, if you continued to express your concerns to your supervisors that might of jeopardized your job?

HARTMAN: Well, I don't know maybe indirectly it did, cause I guess I could be considered a trouble maker because I usually stood up for what I thought was right, I know I made a lot of noise sometimes and probably branded in a hard head or a hot head I mean. I always operated in a common sense type manner and I think I had an uncanny sense of the plant, you know what to look at, in other words as far as how to interpet what everything is doing, scanning the panel and stuff like that and people would come up to me, I don't know tens of times each day asking me stupid questions. I had a startup test engineer come up to me, it was right before shift and he was getting his turnover ready and we had been doing some test, moving water from the pressurizer to the makeup tank, in other words raising and lowering the level of the pressurizer, what we were doing and he came over to me and says where did all the

water in the makeup tank come from, I said it came from the pressurizer, I snapped at him, that is obvious if he'd seen makeup tank how is it going to come in there but one of three ways, that or the pressurizer which the chart was sticking out of was a big drop in it and he says well gee I'm sorry you know, he didn't believe me, he actually did not believe me, that it came from the pressurizer because I got it later that he and his relief stood out there for two hours trying to figure it out. That's the kinda stupid stuff that I would just fly off the handle at, I mean that is obvious.

CHRISTOPHER: Hal I just want to drop back a little bit, we're getting a little bit off this one track of this issue, we have been talking about your concerns for the security of your job being harrassed, those type of things for either reporting problems in the plant or coming to NRC and with that in mind I would like to specifically...

HARTMAN: And for his safety of concerns Hartman was harrassed and told that he'd better shut up or be fired.

CHRISTOPHER: That's right I am referring to the first page on the tape, that obviously concerns me, it does not seem to be in line with what you just finished telling us. I realize this is Mr. Rosen saying this and that's why I am asking you this question.

HARTMAN: I know exactly what he meant and I knew that he would do this and that's why he didn't, I'm sure that's why he didn't let me see that show to begin with cause I would of picked this stuff up. This statement, and for his safety concerns Hartman was harrassed and told that he'd better shut up or be fired, I can remember the night very well. I don't know if you've done any investigation into the alarm system, the overhead alarms, the constant, every once in a while you'd get one and it would be constant and you couldn't get it to reset.

CHRISTOPHER: I think you mentioned that to us before about the alarm problem.

HARTMAN: In here I think.

CHRISTOPHER: Yeah I think you also mentioned it to us last Saturday.

HARTMAN: I think I even mentioned in there about, no maybe I didn't about Mehler.

CHRISTOPHER: I let it be noted that Hal is referring to his original interview transcript from May 22, 1979.

HARTMAN: Okay, so I don't know if I really...

MARTIN: Hal you did mention that you discussed it with Mr. Mehler and I remember his response.

CHRISTOPHER: You did,

HARTMAN: Are you going to fix this alarm, am I gonna have to go through the startup with this alarm in my ear and I've got this to operate, 20 hundred, 7 hundred and 72 megawatts of nuclear power and I've gotta listen to that, I want relieved and he said alright I'll get your relief but you my as well take your lunch box and go out the gate, now do you want that or are you going to calm down, I says are you going to get that alarm fixed and I don't know what powers that may be but that alarm stopped, you know.

CHRISTOPHER: I recall you saying last time.

HARTMAN: That is what he is talking about right there.

CHRISTOPHER: I guess my point is, what I'm trying to clarify that to me, my interpretation is quite a bit different than what is written here and I would like to make sure that we're clear that you were harrassed and told you better shut up or be fired, is that an accurate statement?

HARTMAN: It's an accurate statement but he never mentioned the real crux of the reason.

CHRISTOPHER: It was about one individual isolated concern.

HARTMAN: And he didn't explain that one individual isolated concern, he just made that statement.

CHRISTOPHER: Do you believe that under the circumstances that you related where this incident occurred, was the wording used, pardon me for being specific but I'd prefer it put away once and for all, were you told by Mr. Mehler, was it Mr. Mehler, were you told shut up or your going to be fired or were you told if you want to do that you may as well take you lunch box and go?

HARTMAN: Yeah and that usually met being fired, it wasn't being fired but that's the way it is once you walk off the job, you know you may as well forget it.

CHRISTOPHER: I understand, I think I can understand the context in which somebody would say that to you in the Control Room under a stress situation, do you really believe, did you really believe at that time or do you believe now that it was actually the supervisors intention

that you should quit or that you should be fired or do you believe that this is a statement made through a Control Room that is quickly gone, quickly forgotten but was it a serious statement?

HARTMAN: I wish I had gone through with it, then I could of told you, I don't know, I think it was very serious at the time.

CHRISTOPHER: Hal on terms of this you'd better shut up or be fired as you recorded in the tape, your referring to one particular instance as you have just described.

HARTMAN: Absolutely, yeah. That's was just one flareup in the Control Room, that wasn't a combination of all these things.

CHRISTOPHER: And it also was not used in the terminology as reported in the transcript of the tape.

HARTMAN: No right, that is not a quote.

CHRISTOPHER: You'd better shut up or be fired.

HARTMAN: That is not a quote.

MARTIN: Mr. Mehler was not your normal supervisor, Bernie Smith and Dick Hoyt were, did they ever intimate or give you a similar impression about your expressing your concerns, that if you continue to express your concerns your job was in jeopardy?

HARTMAN: No because Bernie was a pretty diplomatic person, you know he can, he knew me pretty well and he could give me an answer that would satisfy me, you know like yeah we got something in the mill down there and there working on it and you know he could generally keep me calm, I don't think I could of worked for any of the other because you know I was so outgoing and I don't know. There was another instance that I almost quit, no I don't want to get into that, I already went over that I think.

MARTIN: Hal we appear to have and I'll be quite blunt right now, Mr. Mehler's name comes up a couple times here in the area of concerns, do we have the potential of maybe Mr. Mehler and you having a personality conflict?

HARTMAN: No I don't think so, I think it was just, I think it was just, he was there and it was, it might be a personality conflict, the way he handled himself.

MARTIN: His modus operandi was not like what your used to or something.

HARTMAN: Yeah.

CHRISTOPHER: You only worked for Brian Mehler for a one week period, is that right?

HARTMAN: Well I don't know, it was one week, it was brief periods, I can only remember yeah it was like maybe in a week.

CHRISTOPHER: Okay.

MARTIN: Keith do you have any further things in this particular area?

CHRISTOPHER: I don't think so.

MARTIN: Okay the follow one that I would like to refer to is your termination of employement with Met Ed. I'd like to go into some detail, when you returned from Lynchburg where did you come back to, did you come to your home or did you go to the...

HARTMAN: I went to the observation center.

MARTIN: To the observation center, and that would be when?

MARTIN: Probably around 5:30 or 6:00 on Friday afternoon.

CHRISTOPHER: That would of been the 30th, is that right?

HARTMAN: Right.

MARTIN: Okay, what was going on there?

HARTMAN: Well they had alot of, what I can remember they had alot of people just trying to transmit data from one spot to the next and I, you know I just kinda went around trying to pick up bits and pieces of what was going on you know.

MARTIN: Hal did you get in any arguments with people there at the observation center at that time?

HARTMAN: No I don't think there was any argument, I did make mention to Greg Hitz, I said I don't think I could, I said I don't think I'm going to be in and that was it.

CHRISTOPHER: This was who you made this comment to, Greg...

HARTMAN: Greg Hitz.

CHRISTOPHER: That's H I T Z.

HARTMAN: Yeah.

CHRISTOPHER: Is he another operator?

HARTMAN: He was a Shift Supervisor.

MARTIN: Okay, when you mentioned that you might not be in, were you supposed to be in that day or the next?

HARTMAN: No we're supposed to be on a four day weekend and so as far as I knew the next time I was to come in was Wednesday and so I stayed home the whole weekend, in fact I went home that Friday night and mulled this thing over and you know just with the events and the previous year and six months I just knew I was right up to there, so I called Jim Floyd and told him that I resigned.

CHRISTOPHER: Did you call him Friday night?

HARTMAN: Yeah.

CHRISTOPHER: Do you know what time that was, roughly?

HARTMAN: Roughly 8:00.

CHRISTOPHER: And what, you just told him that you resigned, did you tell him wh did you tell him why you were resigning?

HARTMAN: I can't recall, no I think, I'm just gonna have to resign, that's all.

CHRISTOPHER: What did he say to you Hal when you told him this?

HARTMAN: Well from what I can remember I think he expressed his sorrow, that he was sorry to see me do this, he didn't want to see me, see me go.

CHRISTOPHER: Okay, did, were you required to formally do anything to effect resignation or did you just call and say I'm not gonna come in anymore, give your two week notice, are you required to give a written notice of termination?

HARTMAN: Oh yeah I did tell him that I would have something a little more formal on Wednesday when I came in.

CHRISTOPHER: You meant by a written termination?

HARTMAN: Yeah.

MARTIN: When did you first put your resignation in writing?

HARTMAN: I forget what the date was but I know they post dated it to the 30th of March, it would of been Thrusday, Thrusday the...

MARTIN: The 30th would of been Friday.

HARTMAN: The 4th I think, the 4th of April.

CHRISTOPHER: Did you write up your notice of termination yourself or did somebody write it up and you sign it?

HARTMAN: I wrote it up myself.

CHRISTOPHER: What are you required to do, just write them a note?

HARTMAN: Yeah I just wrote on there, terminate hereby, terminating effective, they wanted me to put down March 30.

CHRISTOPHER: When did you actually write that out?

HARTMAN: That was the 4th of April.

CHRISTOPHER: The morning of the fourth?

HARTMAN: No it would be in the afternoon.

CHRISTOPHER: And who instructed you to date it the 30th?

HARTMAN: Gary Miller.

CHRISTOPHER: Gary Miller, okay.

HARTMAN: And Tom Hombach was there to.

CHRISTOPHER: Okay, did they say why you should write it for the 30th?

HARTMAN: Well they said because that was the original time that I talked to Jim Floyd, prior to this 4th I think on Wednesday I went in with a meeting with Jim Floyd and the union people and Gary Miller I think, before we went over to that one he says, he called me into the Shift Supervisors office there and said Hal I'm sorry to see this happening, you know, but it's not finished yet, you know, I didn't know what that meant and then he went off and then we had this meeting out in the, I forget where it was but Jim Floyd was there and a union rep was there and I can't remember who else, I think Tom Hombach was there, wanting to know some of the details like I just explained to you and

after that meeting was over Jim Floyd patted me on the back he says don't sweat, you know cause I told them when I got back there I was a little rash and maybe a little hasty in my decision and I'd like to withdraw that, my resignation.

CHRISTOPHER: When was that, that you did that Hal?

HARTMAN: It would of been Wednesday.

CHRISTOPHER Which would of been the 4th?

HARTMAN: That was the 4th.

CHRISTOPHER: Was that after you had written up your resignation or before?

HARTMAN: Wait did I say the 4th?

CHRISTOPHER: The 4th would of been Wednesday, which would of been the first day that you were due back to work.

HARTMAN: Okay I'm sorry it was the 5th that I wrote the resignation.

CHRISTOPHER: Okay, when did you tell them that you would like to withdraw your resignation?

HARTMAN: That would of been the 3rd.

CHRISTOPHER: The 3rd, that would of been Monday?

HARTMAN: No Tuesday, Wednesday, Wednesday.

CHRISTOPHER: That would of been the 4th.

HARTMAN: Yeah the 4th.

CHRISTOPHER: And who did you tell that to Hal?

HARTMAN: Pardon?

CHRISTOPHER: Who did you tell that you wanted to withdraw?

HARTMAN: I think it was Jim Floyd, I can't really be sure.

CHRISTOPHER: Do you recall what he said to you when you told him you wanted to withdraw?

HARTMAN: Well like I said I can't even remember when I said it but I know I said it, it was probably in that meeting and after the meeting was all over somebody said we'll get back to you in the morning or we'll get back to you this afternoon and we walked out of the meeting and Jim put his hand on my shoulder, gave me a pat on the back, he says don't sweat Hal, no sweat.

CHRISTOPHER: And what was he referring to?

HARTMAN: Well he was referring to, you know I'd be aloud to rescind my resignation and then that afternoon I got a call from somebody in personnel, I trying to think of his name now.

CHRISTOPHER: That afternoon being the 4th?

HARTMAN: Yeah that Wednesday. I can't remember who it was down there but it was somebody from the personnel office called me up and said that you know your ok, don't sweat anything, you know, and then Thursday I came into work and I guess in the afternoon they said go down to Gary Miller's office, so I went down to Gary Miller's office and I was in there, Tom Hombach was there and my union representative was there and they asked me for my resignation.

CHRISTOPHER: This was the 5th?

HARTMAN: The 5th and that was it, I wrote it out and I was told to go on sick leave.

CHRISTOPHER: Was this something that you were adverse to doing or did you want to go ahead and submit your resignation at that time? Obviously you had changed your mind back and forth a little bit as to whether you actually wanted to leave or did not want to leave at that time when he asked you to go ahead....

HARTMAN: Okay what I did was just make it formal because I think I would of, they said that they could have, they could take my word for, for my resignation, in other words the initial word I gave to Jim Floyd was enough but that they just wanted to make it formal so it was either I, this was the impression I got is that they could either make it formal with a letter or you know bang me off with what I said to Jim Floyd on the 30th.

CHRISTOPHER: What did you want at that point, did you want to resign?

HARTMAN: No I still didn't want to resign and I said, I asked them if there was other jobs, I said that I could revert back to Auxilliary Operator and he says no because you still have to react under stress, at this time they felt I could not operate under stress.

CHRISTOPHER: Why, what was that based on, do you know?

HARTMAN: I guess it was because my blood pressure was so, you know just because of the incident and it was high because of this, I am going to loose my job and if I do why, you know.

CHRISTOPHER: How would they have known about your blood pressure, did you see a doctor that weekend?

HARTMAN: I saw a doctor on Monday, this was Monday the 30, 31, the 2nd of April I saw a doctor.

CHRISTOPHER: Was this a company doctor or is this your own private physician?

HARTMAN: My own physician.

CHRISTOPHER: Was this because you were feeling badly?

HARTMAN: Yeah because I was just feeling bad.

CHRISTOPHER: Okay what were the results of that?

HARTMAN: Well he just told me that I was over anxious and he said not to worry about anything and he gave me some pills for anxiety you know, so I was on that and I asked him, do you think I could go back to work and I got the impression that he said yeah you could go back Wedsneday, whenever you wanted but he did say that I should of stayed off a week anyway, but I came back under the impression that, and apparently they called up my doc and found out that I shouldn't have been at work and I think that that's where this thing got miscontrued.

CHRISTOPHER: Did the doctor tell...

HARTMAN: They told, well yeah I think I told them that I was on this medication but it shouldn't affect my, it's not a drug or anything you know, upper librium or anything like that and that it was just for anxiety. They said are you supposed to be back to work and I said yeah as far as I know.

CHRISTOPHER: It sounds like maybe your doctor told them something different. The way your talking it sounds like the doctor said something different to the company when they asked him. Do you know what the doctor said to them?

HARTMAN: He said to them that I should have been off a week.

CHRISTOPHER: Did you confirm that with the doctor that he had told them that?

HARTMAN: Yeah and he confirmed that that's what he told me also.

CHRISTOPHER: Who was your doctor?

HARTMAN: Doctor Caranzy in Palmira.

CHRISTOPHER: That's your family physician?

HARTMAN: Yeah.

CHRISTOPHER: Okay.

HARTMAN: So anyway then after this whole thing got started or I signed by resignation I was escorted off the Island. They told me I couldn't have an Auxilliary Operator job and they told me that I couldn't, I don't know if there was any other jobs available at that time.

CHRISTOPHER: By they you mean...

HARTMAN: Tom Hombach.

CHRISTOPHER: Tom Hombach that is the Personnel Manager?

HARTMAN: He was the Personnel Director, yeah for division. At this point I think Gary Miller had left after he told me that I couldn't be an Auxilliary Operator and that they were pulling by license as a Reactor Operator. He left and then Tom Hombach took over.

CHRISTOPHER: I'm a little confused in terms of how the psyhchological stress evaluation got into this situation, it would appear that you had rasigned and you were gone and subsequent to that you had this stress evaluation, could you explain that?

HARTMAN: Okay this is what happened. I was, I told them that I be willing to take a job in another part of the plant but that I would have to submit to a psychological evaluation given to all new employees.

CHRISTOPHER: This was told to you by...

HARTMAN: Tom Hombach.

CHRISTOPHER: Tom Hombach okay.

HARTMAN: No this was related from Tom Hombach to my Union President to me.

CHRISTOPHER: What was the reason for that?

HARTMAN: Well that's just union company report.

CHRISTOPHER: I mean what was the reason for...

HARTMAN: Oh for the psychological exam.

CHRISTOPHER: Taking the psychological...

HARTMAN: I don't know, apparently, I don't know why. Apparently they must of thought that this, maybe my irrational behavior, you know, was enough to, I mean by saying irrational you know, going, resigning at the split of a crisis and then wanting to come back and you know that might add enough signal.

CHRISTOPHER: Well you're saying that the evaluation was a contigency that if, that you, if you got a clean bill of health that you could come back, is that what it was designed to be?

HARTMAN: Well they said that they would find something for me other than the Control Room or Auxilliary Operator, so I figured I'd go to the Utility gang or something, so I wouldn't, I wouldn't come back in the same capacity as I left.

CHRISTOPHER: But that was based on the requirement for you to...

HARTMAN: I had to pass this, pass this psychological evaluation.

CHRISTOPHER: Okay. Did you agree to take this psychological evaluation?

HARTMAN: I told them I would agree to take it if I was provided with a neutral psychologist.

CHRISTOPHER: Okay and there response to that was what?

HARTMAN: There response to that was that they have a neutral psychologist.

CHRISTOPHER: A contract firm?

HARTMAN: A contract firm, who since, I found out later he has been doing business with Met Ed for 10 years.

CHRISTOPHER: In this type of affair?

HARTMAN: Yeah.

CHRISTOPHER: Okay.

HARTMAN: He told me when I left the, when I left the, his office I was under the impression that I was ok. I might of had some irrational ideas about the company and stuff like that but to me it didn't signal that I would be irrational doing my job. He told them, I guess my impression of what he told them was, he said to me that I was okay to work at the Island provided I didn't have to work in any security areas and since they had no jobs up there for me, that required me not to go into a security area that they had no employment for me.

CHRISTOPHER: Now I'm, let me throw this out because I'm familiar with those type of things in the sense that I've had those in previous employment. My understanding of the way that worked is using a contract stress evaluation for people, that after you took their examination we'll call it, if you were not satisified with their findings that you had the opportunity to have an independent neutral analyst, whether he's a psychologist or whatever the term may be, of your own choosing analyze the data and confirm with the other psychologist or stress evaluator for a second opinion. Did you have the opportunity to do that?

HARTMAN: No.

CHRISTOPHER: Were you told that you could have a independent counselor of your own choice compare the data with this documented stress analyses?

HARTMAN: Not that I can recall.

CHRISTOPHER: Okay.

HARTMAN: Because I think I would of done it.

CHRISTOPHER: Okay. Hal would have stayed with the Company if they had offered you a new job?

HARTMAN: I probably would have stayed with them long enough to find another job, really, cause at that point with the events that had gone up prior to that. It probably wouldn't have been to much fun anymore.

CHRISTOPHER: Hal along this line let me go back to the transcript of Ira Rosen, I'd like to get these specifics. Again, this is something that Mr. Rosen, this is the terminology he uses and I'd like you to tell me how it compares to how you feel. This is on page 5 at the bottom, "but rather than being heralded at as a prophet things went bad for Hartman after the accident, he was forced to resign according to reliable sources when a company psychologist said he was to high strung to work in a security area, even though he had been working in one for six years".

HARTMAN: I don't know what his reliable sources are and he used the term "company psychologist" you know these are all things I pointed out to him to, you know I corrected him on, I said he's not a company psychologist he's part of Stress Control.

CHRISTOPHER: Which is an independent.

HARTMAN: Which is an independent examining firm.

CHRISTOPHER: Well this is why I want to bring these specific points to you because I have the impression that maybe what is said here is not exactly what you said and I would prefer you to clarify it rather than go on what's in this transcript. Force to me kind of takes a pretty volatile act.

HARTMAN: Well that's the way reporters are too.

CHRISTOPHER: I agree, I guess my question to you is, is this an accurate statement?

HARTMAN: No.

CHRISTOPHER: I'm sorry, you said no.

HARTMAN: No it's not accurate to the point that I was forced to resign according to reliable sources, I don't know what his reliable sources are.

CHRISTOPHER: Yeah I was hoping you could tell me because I don't know either.

HARTMAN: And when a company psychologist and I've told him before that the company psychologist was not a company psychologist but a psychologist who was contracted by Stress Control to do the test, and he said I was to high strung, that was true, even though he had been working in one for six years and there's more glorification. Basically I just, I just reiterate what I just said.

MARTIN: Hal there's one other area I'd like to clarify. What was your status with your requalification program? Were you down there for special training in Lynchburg or was that your normal cycle to go down there?

HARTMAN: This was just a normal cycle to go down.

MARTIN: Were you passing all your sections of your requalification program?

HARTMAN: Oh sure.

MARTIN: Would you repeat for me the reasons why you initially resigned from the job on March 30th?

HARTMAN: I guess the real reason I, I just kept working over in my mind that you know this accident was very serious and I knew it was serious and that it would take a long time to get things under control. I also knew the problems that I experienced in the previous two years with the testing program and the startup and hot functionals, power escalation, it was no fun, it was just no fun it was really, it really caused me alot of, alot of anxiety because you know I just couldn't go in on a Wednesday if they had one particular test scheduled for Wednesday, I couldn't leave Tuesday and mentally prepare for this test, in other words, go over it in my mind, you know not necessarily sit down with the print books and the procedures and things like that but just go over it in my mind, perhaps some trouble spots, some areas that I might be able to concentrate on, just you know get yourself psyched up for a ball game and I would go in and do this and they were still doing what they were doing yesterday.

CHRISTOPHER: We came to an end of the first tape at 9:48 P.M. We are going to tape #2 and continuing.

HARTMAN: Okay. So anyway you know just all of these things that I couldn't go into work and expect the equipment to work right. I just I got so anxious and so apprehensive. My stomach would just be in knots the whole time that I had the panel. You know it just got to be such an, you know really a drudge to go in because I saw that things weren't really being done. I didn't really foresee any change and then when the accident, I was considering quitting you know like oh a year or two ago or a year or two before. And I had a job offer, it wasn't up to my monetary expectations so I turned it down, that was in St. Louis too by the way but I had been looking from that time. So when the accident happened, it was something I don't know why I'm not a perfectionist guru or anything I don't really perfess to see in the future but all the events I've seen in the previous two years just told me that something big was going to happen. The constant up and down for just the little things, some time I made it up in my own mind that you know several small things were going to happen and it's going to be big. And I just didn't want to part of it. There was just no way. I don't know. That's just basically my feelings and when I came home from the accident and I saw all those people, I mean. In the Control Room during a normal testing day was constant from 10 or 20 people all the time, phone calls, radios, handling the page, constant people asking the question, why are you doing this, why are you that. Hey what if, what are you doing now you know. This was just nerve racking to the point that a lot of it could be prevented from you know not allowing

extraneous people above the lines. Every once in awhile I just get so frustrated and say "allright everybody back behind the lines" and in a half hour later, you know everybody would mingle up again. And I don't know it's just a combintaion of all these little things that finally broke my back. And that's all.

MARTIN: I have no further questions.

CHRISTOPHER: Nor do I.

CHRISTOPHER: Okay. Hal. I just want to say I thank you a lot, we spent a lot of time here with this and we'll probably spend a little bit before we get out of here. I have no further questions. Again I will see that you get a copy of the tapes as soon as we can get them made per your request, okay. I would assume we would mail to you by registered mail or pick them will be a simple arrangement like that.

MARTIN: We may still be out here.

CHRISTOPHER: We may. At this point, do you have anything else Hal at this time that you would like to tell us something that maybe we have not covered, something that it is germaine to this issue or something that is not geramine to this issue but that you think we should know about with regards to Three Mile Island or the industry at this point.

HARTMAN: No I don't think so.

MARTIN: Okay. The time is 9:54 and we'll terminate this tape at this time.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

The purpose of this inquiry by the U.S. Nuclear Regulatory Commission is to investigate the concerns and allegations of a former control room operator from Three Mile Island, Unit #2, regarding safety and operational activities at this unit.

You are asked to provide information in as much detail as you can regarding these allegations and provide any recommendations you feel may be useful.

The U.S. Nuclear Regulatory Commission was given the responsibility and authority by the Congress of the United States in the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended, to licensee nuclear power plants and to see they are operated safely to protect the health and safety of the American Public. It is from this Act and Title 10, Code of Federal Regulations, that the U.S. Nuclear Regulatory Commission's Office of Inspection and Enforcement is conducting this official investigation.

You have the right to refuse to be interviewed. If you consent to an interview, you may have someone of your choice present. To assist in obtaining every comment, exactly as it is given, and to expedite the interview, your permission to tape record this interview is requested. You have the right to refuse to have the interview tape recorded. The U.S. Nuclear Regulatory Commssion investigators will prepare a written record of your statements and request you to sign it. You have the right to refuse to give a signed statement. In the absence of a tape recording or a signed statement, the U.S. Nuclear Regulatory Commission investigators will, to the best of their abilities, write your comments for inclusion in the investigative report. Upon your request you will be given a copy of your tape recording or signed statement.

You have the right to request that your identity be protected and not used in the U.S. Nuclear Regulatory Commission investigation report. However, because of the deep concern over this incident by the American public and government officials, the U.S. Nuclear Regulatory Commission cannot assure you that we will not release your name and interview contents if we receive official requests and requests by the public through the Freedom of Information Act. If specifically requested, all attempts will be made by the investigators to keep from disclosing to Metropolitan Edison or other parties specific information. You must recognize that this is not an absolute guarantee. Federal law prohibits your employer from discharging you or discriminating against you because of your interview with the U.S. Nuclear Regulatory Commission.

Your help and cooperation in providing information to the Nuclear Regulatory Commission will be appreciated.

Questions

1. Do you understand the above? yes ☒ no ☐
2. Do we have your permission to tape the interview? yes ☒ no ☐
3. Do you want a copy of the tape? yes ☒ no ☐

[signature] 3-26-80 2005
SIGNATURE DATE

WITNESS R K Christopher 3-26-80 2005
SIGNATURE DATE

INVESTIGATOR
TITLE

WITNESS Thomas T. Martin 3/26/80
SIGNATURE DATE

Section Chief
TITLE

R. Keith Christopher has identified himself to me as an investigator of the Nuclear Regulatory Commission, an agency of the United States, which is performing an investigation authorized by the Atomic Energy Act of 1954, as amended. I understand that any false statement made by me during this investigation may subject me to criminal prosecution under 18 USC 1001.

Harold Thornburg Jr 3-26-80
(interviewee signature)
2006

WITNESS R. K. Christopher 3.26.80 2006
Ronna T. Mack 3/26/80

18 USC 1001 Fraud and False Statements

1001. Statements or entries generally

Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or makes any false, fictitious or fraudulent statements or representations, or makes or uses any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

June 25, 1948, c. 645, 62 Stat. 749.

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION I

A6

DATE - 3-26-80
TIME - 10:25 P.M.

I Harold Hartman do hereby make the following free and voluntary statement to Mr. R. K. Christopher, who has identified himself to me as an Investigator for the U.S. Nuclear Regulatory Commission. I understand this statement is being made in connection with an official NRC Investigation and may, if necessary, be used in judicial or administrative action. I make this statement with no threats having been made against me or promises extended to me.

I would like to take this opportunity to clarify several statements made during my interview with Mr. Ira Rosen. First, Mr. Rosen quotes me as saying "and for his safety concerns Hartman was harassed and told that he'd better shut up or be fired." His statement in this context implies constant harassment when in fact this was an isolated case during plant startup on one occassion when alarms were going off that were irrelevant to the operation of the plant. I had been assigned a control panel on this occasion and had many things to do. I was constantly being bothered by these alarms. I asked the shift supervisor Brian Mehler if he could do something about the alarms because I couldn't put up with the alarms and do a startup. I asked Mehler if I was going to have to put up with this all night. He said I guess you're going to have to, and I said "get me a relief," and Mehler said something to the effect, "Well if I get you a relief you may as well get your lunch box and head out the North gate." I was not constantly harassed and threatened about losing my job for expressing my concerns as was implied by Mr. Rosen.

Second, the reporter states that I said "That part of this system was deliberately tampered with and I was the one who did it." This statement implies I was in the control room and I deliberately tampered with the system. I was not in the control on the night of the accident or in the days preceding the accident and I never deliberately tampered with any system. Mr. Martin has asked me to clarify what I meant when Mr. Rosen asked me if I ever fixed the statistics for the Reactor Coolant System inventory. I was quoted as saying "I didn't do it very often." I did in fact say that and what I was referring to was the ways to get a good leak rate by adding hydrogen to the makeup tank, mistaking the RCDT millivolts, and adding water to the makeup tanks. I, as were all operators, under a great strain to get good leak rates. Each operator had his own technique for getting acceptable results. The pressure to get good leak rates was the result of inner shift pressure because each shift thought they were the best and no shift wanted to be the one to force the unit off the line.

I have been asked to relate the criticality event that occurred when I was working a shift under Brian Mehler. I can't recall specifically when this happened but during a startup the plant went critical below the half percent under ECP. Plant procedures require that I insert the control rods until only the safety rods remain out. I started to do that when I was told by the shift supervisor, Brian Mehler, something to the effect, that I was to stop driving the rods in and continue the startup. The critical data showed 28% on a Group 6 and 7 and that was below the lower limit for going critical. I reminded Mehler that by procedure we should go to 1% shutdown and he said to continue to startup. He had the other operators in the control room calculate a new ECP based on where we went critical. I believe these individuals were RayBooker and Rich Hoyt. The new ECP showed

Harold Hartman's statement

a new boron concentration and the critical positian was now within allowable limits. This is what I was referring to when I said they redid the numbers.

I would also like to address another issue from the TV transcript. References by Mr. Rosen state that I was forced to resign when a company psychologist said I was too high strung to work in a secure area. In reference to the company psychologist the psychologist was a contracted psychologist and not a Met-Ed employee. I feel I was forced to resign but not because of safety issue I had raised but I feel it was because of my hypertension.

I have read, initialed all corrections and understand the above five page statement which was written by Mr. Christopher of the NRC at my request and in my presence. It is true and accurate to the best of my ability.

_____

Subscribed and sworn to before me this 26th day of March 1980 at 11:35 P.M.

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION I

DATE 3-26-80

TIME 10:25 PM

I Harold Hartman do hereby make the following free and voluntary statement to Mr. R. K. Christopher, who has identified himself to me as an Investigator for the U. S. Nuclear Regulatory Commission. I understand this statement is being made in connection with an official NRC Investigation and may, if necessary, be used in judicial or administrative action. I make this statement with no threats having been made against me or promises extended to me.

I would like to take this opportunity to clarify several statements made during my interview with Mr. Ira Rosen. First Mr Rosen quotes me as saying "and for his safety concerns Hartman was harassed and told that he'd better shut up or be fired" His statement in this context implies constant harassement when in fact this was an isolated case during plant startup on one occassion when alarms were going off that were irrelevant to the operation of the Plant. I had been assigned a control Panel on this occassion and had many things to do. I was constantly being bothered by these alarms. I asked the shift supervisor Bryan Mahler if he could

RKC 3-26-80 1135 pm

do something about the alarms because I couldn't put up with the alarms and do a startup. I asked Mehler if I was going to have to put up with this all night. He said I guess you're going to have too, and I said "get me a relief." and Mehler said something to the effect, well if I get you a relief you may as well get your lunch box and head out the North gate. I was not constantly harassed and threatened about losing my job for expressing my concerns as was implied by Mr. Rosen.

Second, the reporter states that I said "that part of the system was deliberately tampered with and I was the one who did it." This statement implies I was in the control room and I deliberately tampered with the system. I was not in the control on the night of the accident or on the days preceding the accident and I never

RKL 3-26-80

Gilbertina 3-26-80 11:35 pm

deliberately tampered with any system.
Mr. Martin has asked me to clarify what I meant when Mr. Rasmussen asked me if I ever fixed the statistics for the Reactor Coolant System Inventory. I was quoted as saying "I didn't do it very often." I did not say that and what I was referring to was the ways to get a good leak rate by adding hydrogen to the makeup tank, mistating the RCDT millivolts, and adding water to the makeup tanks. I, as we all operators under a great strain to get good leak rates. Each operator had his own technique for getting acceptable results. The pressure to get good leak rates was the result of unshift pressure because each shift thought they were the best and no shift wanted to be the one to force the unit off the line.

I have been asked to relate

Hal Sutton 3-26-80 11:35 pm

RKC 3-26-80

1) the criticality event that occurred when I was working a shift under Bryan Mehler. 2) I don't recall specifically when this happened but during a startup the Plant went critical below the half percent under ECP. Plant Procedures require that I insert the control rods until only the safety rods remain out. I started to do that when I was told by the shift supervisor, Brian Mehler something to the effect, that I was to stop drawing the rods and control the startup. The critical data showed 2870 on on Group 6 and 7 and that was below the lower limits for going critical. I reminded Mehler that by Procedure we should go to 170 shutdown and he said to continue the startup. He had the other Operators in the Control Room 3) calculate a new ECP based on where we went critical. I believe these individuals

Bill Lutman 3-26-80

RLC 3-26-80

were Ray Booker and Rick Hoyt.
The new BCP showed a new boron concentration and the Critical Position was now within allowable limits.
This is what I was referring to when I said they redid the numbers.
I would also like to address another issue from the TV transcript.
References by Mr. Rosa state that I was forced to resign when a company Psychologist said I was too high strung to work in a secure area.
In reference to the company Psychologist, the Psychologist was a Contracted Psychologist and not a Met Ed employee.
I feel I was forced to resign but not because of safety issue I had raised but I feel it was because of my hypertension.
I have read, initialed all corrections and understand the above five page statement which was written by Ms. Christopher of the NRC at my request and in my presence. It is true and accurate to the best of my ability.

Harold W. Stanley 3-26-80 11:35 pm

SUBSCRIBED & SWORN TO BEFORE ME THIS 26TH DAY OF MAR. 1980 AT 11:35 P.M.

R K Christopher 3-26-80 11:35 P.M.

T. P. Martin 3/26/80 11:35 P.M.

A7

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of:

IE TMI INVESTIGATION INTERVIEW

of

Brian Mehler
Shift Supervisor

Trailer #5
NRC Investigation Site
TMI Nuclear Power Plant
Middletown, Pennsylvania

March 27, 1980
(Date of Interview)

April 15, 1980
(Data Transcript Typed)

1
(Tape Number(s))

NRC PERSONNEL:

Keith Christopher, Investigator
Thomas Martin, Section Chief, Reactor Projects Section 3

CHRISTOPHER: The date is March 27, 1980, the time is 10:08 AM. This is Keith Christopher, I am an investigator with the U.S. Nuclear Regulatory Commission assigned to Region I, King of Prussia, Pennsylvania. This morning we are located in Trailer #5 at the Nuclear Regulatory Commission site office at Three Mile Island Nuclear Power Station. We're here this morning to conduct an interview of Brian Mehler...spell your last name.

MEHLER: M E H L E R.

CHRISTOPHER: Who is an employee of Metropolitan Edison Company at the Three Mile Island Site. This time I would like the other individuals in the room to identify themselves and identify their positions.

MARTIN: Tim Martin, Section Chief, Reactor Project Section 3, Region I, USNRC.

CHRISTOPHER: Ok.

WILSON: John F. Wilson, Attorney for Metropolitan Edison Company.

CHRISTOPHER: As a matter of record, before we turned on the tape we discussed with Brian a memorandum prepared by this office. This memorandum goes into the purpose and scope of the investigation and to some

degree the rights of the individual being interviewed. On the last page there were several questions which you responded to in the affirmative and for purpose of their record I would like to get your response to those on tape. Number 1 is, Do you understand the above addressed two page memo?

MEHLER: Yes.

CHRISTOPHER: Ok. The second question is, Do we have permission to tape this interview?

MEHLER: Yes.

CHRISTOPHER: Ok. And lastly, Do you want a copy of this tape?

MEHLER: Yes.

CHRISTOPHER: Ok. And for the record, we will get you a copy of the transcript as soon as it can be made available and get it out to you. Ok, and Mr. Martin will initiate his questions.

MARTIN: Brian, I have three areas that I would like to pursue questions in that raised by Mr. Hartman as concerns. The first one is related to an estimated critical position. Let me read what it said in the transcript

of Ira Rosen and Mr. Hartman. "I remember this one particular incident. I was making the startup and I went critical less than a 1/2% from where it should have gone and when we went critical, I immediately took the rods and inserted the rods. As soon as I inserted the rods, the shift supervisor told me, "What are you doing". I said, "We went critical 28%, my esitmated critical position was 68, my minus 1/2% position was 32. I went critical 4% to early and to me there's something wrong". Now the reporter says, "In testimony given to the Nuclear Regulatory Commission investigators, Hartman states that he was told to continue the plant startup even though it would violate the procedures. He told the NRC investigators they redid the numbers and somehow they fudged them. And why did they do it? Do you have any comment?

MEHLER: I don't know the specific incident he is talking about.

MARTIN: Let me provide some clarification. In our interviews with Mr. Hartman, he indicates that it was a plant startup, that he believes it occurred either in the April to May 78 area or possibly in November of 78. It was one of the few startups that he was the RO on the panel that Mr. Hoyt and...

CHRISTOPHER: Ray Booher..

MARTIN: ...and Mr. Ray Booher were also in the control room and that as he was withdrawing rods he got an alarm, he looked up, he had a rod out inhibit, he had a 3 dpm or 2 dpm, he couldn't remember which startup rate. Since he was critical below the 1/2% Δ K/K below the ECP it was his undertanding that the procedure required him to do certain things, he says that he started to do those things by inserting the rods, that and I think his quote was "No, no, take it to one", which and then he subsequently said, that he was forced to continue the startup to 10^{-8} and settle out for the check of ECP. Do you have any comments on that?

MEHLER: I have no comment, because I'm not...I don't remember the incident to be truthful with you.

MARTIN: Have you ever been on a startup where the critical position fell below the ECP allowable ban?

MEHLER: No.

MARTIN: What is the requirement of the procedure if that had occurred?

MEHLER: The requirements of the procedures is to insert rods until your 1% subcritical.

CHRISTOPHER: Brian, it is in his sworn statement that he has stated that this incident did happen so when you say that you...you don't remember that it happened do you think if it did happen that you would have remembered that incident with him?

MEHLER: I'm quite sure I would have remembered that particular incident if he would have had a 3 dpm startup rate.

CHRISTOPHER: Uh uh. Do you get...and as you said you did not work with Harold Hartman that...?

MEHLER: I normally don't work with him. I have been on shift work with him.

CHRISTOPHER: Ok.

MARTIN: Ok, if you're satisfied, that's all I want to talk about that one. The next area is concerning the reactor core or reactor coolant system inventory in that Mr. Hartman states that in the latter months of plant operation it became increasingly difficult to get acceptable leak rates. I think he focused in on the unidentified leak rate the 1 gpm. He says that there was a lot of competition between shifts and they each was camaraderie, esprit de corps whatever you want to call it, and that

no shift really wanted to be the shift that forced the plant off the line because they couldn't get an acceptable leak rate. He felt pressure, he says other operators felt pressure and in fact, each man, each shift had their techniques for getting acceptable ones. Specifically, he states, he did the following: In some cases he increased the pressure in the makeup tank, which he says sometimes gave him a good leak rate and other cases he said he actually added water while they were running the test and another case he says that they mistated the millivolt reading on the RCDT that was put into the computer. These things he said he did. He says other people had those and other techniques. Do you have any comment on this?

MEHLER: I...yeah, I can't tell you if he did them or not. I did. You know, we have on the leak rate, we went out in the plant and identified leakage as safe, because your allowed to do that by the procedure and subtract that amount of leakage from the ordinary leakage and that's documented and signed, you know, as far as him I do know that pressure in the makeup tank will affect the leak rate and the guys doing that or adding water to it is a no, no. you know, and I'm not aware that they did it.

MARTIN: Help me a little bit. I don't understand how increasing the pressure in the makeup tank effects the inventory.

MEHLER: I just know that if the increase in pressure it would somehow make the makeup tank level to the computer change...

MARTIN: Ok. What...do you have any...

MEHLER: What mechanism, I do not know. Normally we did, you know I...normally when you ran a leak rate you ran it for an hour you tried to hold the plant in stable condition without changing any other parameters. I can't answer for what he did.

MARTIN: Are you aware of anybody fudging these leak rate calculations?

MEHLER: No, I am not aware that anyone fudged the leak rate calculations.

MARTIN: Was there any pressure on the operators to fudge leak rates?

MEHLER: No.

MARTIN: Ok, let me refer again to a statement that is in the transcript. Ok in this particular transcript and I'll kinda read it in sequence here. First there's Hartman. "There were certain things we could do to make it less than 1 gallon per minute". The reporter says, "What did you do"?, Hartman says, "There were certain things, like something simple, like adding hydrogen to the makeup tank, it's a gas to prevent

oxidation in the coolant pipes". Reporter, "Did you fix the satistics", Hartman, "I didn't do it very often. I did it only if I was watched very closely and was told that I had to have one by 6:00 in the morning. It was a dire situation, I avoided it", and he continues on but clear to anybody that hears this thing that he feels he's under pressure and that somebodies watching over his shoulder to make sure he gets a good one, an acceptable one. Do you have any comments on that?

MEHLER: I don't think anyone pressured him into every getting a good one. You know, that...

MARTIN: Ok.

MEHLER: ...he may have felt pressure, you know, but I don't think it was exerted on him from above, you know, I know I never exerted that type of pressure to anyone, because that's against me.

MARTIN: Ok, lets continue. When you ran a computer program, and you got an unacceptable leak rate, what did you do with it?

MEHLER: We usually ran another one.

MARTIN: Why?

MEHLER: Because, you know, just like anything, the first one could be bad because there could've been something in the plant that was unstable at that time, they could've just made it just a shade over a gallon.

MARTIN: Were you required to make a determination that there was a rational cause for invalidating that leak rate?

MEHLER: No.

MARTIN: Did that strike you as funny that you could just...you could get an unacceptable leak rate and continue operation?

MEHLER: You know, if you got a leak rate that said you had a 10 gallon a minute leak rate and you looked at your makeup tank and you didn't see a big decrease you know it wasn't correct. It was obvious that...you know, and then you gotta assume that somewhere that temperature changed or something happened in the drain tank which cause it to be erroneous and you run another one.

MARTIN: Ok. We've been told that leak rate test that failed, there records were crumbled up and thrown in the trash can. Is that true?

MEHLER: Yeah.

MARTIN: Would this include those that you really couldn't have a valid reason for throwing them out, that they were greater than 1 gpm and you had a gut feeling that it couldn't be there?

MEHLER: I would say yes. You know.

MARTIN: Ok, I'm going to try and go through an educational process here again.

MEHLER: Yeah, Ok.

MARTIN: This I think is the Tech Spec we are referring to 3452 or 62 and particularly the 1 gpm leakage and my question to you is given that the computer program has generated a indicatedly greater than 1 gpm and that you cannot rationalize why it is invalid. Why are you not immediately kicked into the action statement?

MEHLER: You would be, but you can run another leak rate, you could go on determining if you have any identifiable leakage...

MARTIN: But your still in the action statement at that point and if you do not find something within six hours you've got to go down, you gotta do what it says here. Is that correct?

MEHLER: Um um, that's what it says yes, that's correct.

MARTIN: Now is that what was done?

MEHLER: We've always got a good one within that time period.

MARTIN: Oh I see, Ok. So in actuality we didn't have 72 hours to get a good one. Once we had a bad one that we could not logically invalidate we immediately went into the action statement and if within the 6 hours we didn't get an acceptable one, we went down.

MEHLER: I know when we didn't get a good leak rate, we went on and tried to determine the known leakage and measure it and determine the amount of it and document it and add it to the known leakage which would be subtracted from the unknown leakage to validate a good leak rate less than 1.

MARTIN: Ok. Keith, do you have any other questions in this area?

MEHLER: You know, and I'm quite sure if you go back to the rate, you'll find that our procedure tells you where the leakage is from, how much it was, and names of who found it and who justified it. And that's in the record.

CHRISTOPHER: I had wanted to go back to an area that maybe I was a little confused on. You mentioned that you were never aware of any time where they added to the makeup tank?

MEHLER: Yes.

CHRISTOPHER: Ok, but you are aware that that makeup...added to the makeup tank effects the rates.

MEHLER: Definitely it would. You know...

CHRISTOPHER: Is that from experience of adding to the makeup tank in your own capacity or just from what you precaive as your knowledge of the system?

MEHLER: Your talking about the hydrogen makeup?

CHRISTOPHER: Yeah.

MEHLER: That's from previous knowledge that I've seen it happen.

CHRISTOPHER: When you have seen the hydrogen added to the makeup system.

MEHLER: Adding hydrogen to the makeup tank will change the leakage out of the makeup tank. In other words it'll probably make it smaller.

CHRISTOPHER: Ok.

MEHLER: Uh, it's been a long time.

MARTIN: Ok. One more question in the area of the leak rate. I've lost my train of thought. Ok, let's leave that for the moment and I'll come back to it. The next area I would like to talk about is the handling of safety concerns. Mr. Hartman has indicated others have indicated that he has surfaced a number of safety concerns which he has expressed to his supervision. Among them, he mentioned the leak rate test, the following of procedures by other operators, the emergency feedwater surveillance test that they kept having to change the reference values. The ECP problem that we've talked about earlier today that the lack of compliance of operators with procedures and NRC regulations. He indicated that this was communicated to his supervision orally and in most cased he couldn't identify where a specific corrective action had been taken. Have you ever been on the receiving end of a concern for Mr. Hartman? And if so, what action did you take?

MEHLER: I was on the receiving end of one of his problems when he complained about all the alarms going off in the computer during the startup phase of the program which at that point your going to have a lot of alarms because they aren't set yet, you know, we went through the same problem in Unit 1 and it's something you got to live with until you know there all adjusted properly and he became a little over wrought because of it and said that he don't have to put up with this type of stuff to get him a relief and I proceded to get him a relief and then after he had figured out that I was going to carry...that I wasn't going to back down from his threat, he said that, Ok, don't call no one, I'll stay.

CHRISTOPHER: The interpretation that was laid to that was at that point he was being threatened with being fired. Was that accurate?

MEHLER: No.

CHRISTOPHER: Ok, I'm getting that as an interpretation. Did you recall making a comment to him that, something to the effect, that if you want a relief you may as well get your lunch bucket and go out the north gate?

MEHLER: Uh uh. (No)

CHRISTOPHER: You don't remember saying that to him?

MEHLER: No, I didn't say that to him. I told him if it's that bad I will give you relief and if you...I think you should talk to Mr. Hoyt and find out that he was on the telephone calling the CRO's to come in and relieve him at that time when he decided that from then on he don't need...in fact, I think, if you checked I instructed Ray Booher to relieve him on the panel so he wouldn't be under the pressure.

CHRISTOPHER: Uh uh. I guess this is a personal opinion question I'm going to ask. It appears just from going over these things and listening to what every one has said there was a certain conflict between you and Harold Hartman. Was there a personality thing or just a working conflict that may have effected the way perceptions of activities were handled or...?

MEHLER: I don't know if Hal had conflict with me or not, you know, you can make that statement one way or the other. I had no conflict with Hal. I treated all the CRO's the way I treated everyone of them the same way. You know if he had problems I would have tried to adjust to him accordingly and just the way I would with any other CRO and if he became unstable I would remove him.

CHRISTOPHER: Ok.

MEHLER: You know, if it was Hal Hartman or whether it was...I don't care who it was that said get me relief, I would have got them relief, because he's telling me at that particular time that he's not capable of handling it.

CHRISTOPHER: Ok. Going back to the questions in regards to the safety concerns, you did not have that much contact with Harold Hartman because he's not normally on your shift, right?

MEHLER: That's correct. I think I only had contact with him maybe, I think I was on shift with him through one period of time maybe for a week.

CHRISTOPHER: Did you feel in just looking back overall that there was a problem with your operators not coming forward to you to give you information about what they believed were problems because they were afraid they would be categorized as a complainer or would be in jeopardy of their good standing if they brought to your attention complaints?

MEHLER: No.

CHRISTOPHER: Was it common for your people to come forward to you on your other shifts about complaints?

MEHLER: Yes.

CHRISTOPHER: Ok.

MEHLER: You know, if they had any complaints they'd voice them. In fact you probably ask people that were on my shift in Unit 2 if they had voiced their complaints to me.

CHRISTOPHER: Were many of their complaints similar to what Harold Hartman's complaints were?

MEHLER: No. I don't think they had nearly as many complaints as Harold Hartman.

MARTIN: Was Harold's job in jeopardy because he was a complainer?

MEHLER: I would say not.

MARTIN: Ok. I remembered my one question from the leak rate area. We had previously made a statement or you had previously made a statement to go back and look at the records to see that...how these leak rates

were found to be acceptable. Unfortunately you also told me that the ones that you didn't feel were acceptable you tossed out. So how am I going to find out if they were actually acceptable or there was some real rational for tossing them. I guess my point is in the future please don't throw out those records unless you have a valid reason and you know, or can provide a mechanism because what the Tech Spec says...

MEHLER: I think you'll find some that showed an unidentifiable leakage greater than 1%, you know, when we did discover the actual leakage and identifiable that was stapled on to it with a justification.

MARTIN: Yeah. The NRC has no problem if you have a valid reason for invalidating the thing. The Tech Spec is specifically written, the plant must be stable in order for this Tech Spec to apply. With the plant stable the leak rate must be such and such. Ok. We recognize in an unstable condition it is almost impossible to do a calculation. We also recognize there are other things which can affect the leak rate and make it invalid. In those cases an explanation, a very quick explanation the plant is in an up power transient or whatever. This is an invalid leak rate starting again, beautiful, you know, that item is closed, but you could see we are now open to an allegation and you don't have support, the company have no support for your position and we have no way of proving either side of the arguement.

MEHLER: I understand that.

MARTIN: Ok. And I guess the other issue that I wanted to make sure we were talking the same words. Once you do have a leak rate which you cannot invalidate through some logic that happens to exceed that limit, your immediately kicked into the action statement, you do not have the rest of the 72 hours since the last good one because of the way the basis is written for the whole surveillance program which says that nothing in, I think it was in Tech Spec 403, nothing in here implies that you can use old data to invalidate a new piece of information which you've just got, the newest piece of information, unless you can invalidate it is the one you believe. Believe your indication, unless proven otherwise. And just because the surveillance period hasn't ended that newest piece of information is the one you must believe unless you have proof positive that that's invalid, and I want to make sure that everyone understands that and that's what the NRC condones not the other thing. Ok.

CHRISTOPHER: Ok, I have one other question that I wanted to bring up to you Brian, just for confirmation in trying to determine the circumstances in the events that led up to Harold Hartman's resignation or termination as you would call it. Did you have any involvement in the process of that termination?

MEHLER: Harold Hartmen, and I don't know which particular day it was, that they came back from the simulator, it was like during the accident, you know, he was a very irrational over at the observation center, which I don't know if it's documented or not and he made a lot of statements and he was in a very incoherent condition and he resigned immediately there.

CHRISTOPHER: Were you at the observation center?

MEHLER: I was not, this was all here say coming back...

CHRISTOPHER: Ok.

MEHLER: ...and you know, I can't say.. I talked to individuals that were there. Then I think he came back to work three days later after, you know, the major portion of the crisis was over and wanted to resume his job, after he'd already resigned and that don't go well with me. And I voiced my opinion on that.

CHRISTOPHER: Ok, who did you voice that to, to him or to...

MEHLER: No, to my immediate supervisor in Unit 2 which was Floyd at the time.

CHRISTOPHER: Ok. Had he submitted a written termination notice at that time?

MEHLER: I couldn't tell you that.

CHRISTOPHER: Oh. Did you recall if you'd asked him to submit his written termination or...?

MEHLER: I did not talk to Hal Hartman previous to the 28th or after the 28th, in fact, I haven't speaken to the man since he was down at Lynchburg the week of the 28th.

CHRISTOPHER: Ok, I just wanted to clarify that, that issue, Ok. Just one other thing that I've gotta do here, I didn't, I think I neglected at the beginning of the interview just to outline basically what your background is, Brian, if you would, would you basically state, you know, just for the record what your position here is with Metropolitan Edison.

MEHLER: My position at Metropolitan Edison is Shift Supervisor.

CHRISTOPHER: Ok, how long have you been a Shift Supervisor?

MEHLER: I've been a Shift Supervisor ever since...

CHRISTOPHER: An approximate date will be...

MEHLER: It was April, but I'm trying to think of the year. Two years ago, April 78.

CHRISTOPHER: Ok...

MEHLER: It would have to be 78.

CHRISTOPHER: And during those periods you intermittently had Harold Hartman under your supervision on a shift?

MEHLER: Yes, intermittently.

CHRISTOPHER: But he was not part of your regular crew?

MEHLER: He was not part of my normal shift. Harold Hartman was an AO in Unit 1 and I had contact with him also over there.

CHRISTOPHER: Ok, I just wanted to clarify that because I didn't do it at the beginning. Is there anything else at this point that you would like to bring out to voice your concern about in regards to the allegations made about...made by Harold Hartman. Anything that has come up in

this interview that concerns you, or anything else that is not germane to this particular issue in relation to the plant that you would like to bring up to us?

MEHLER: I'm very concerned about ECP. You know, I wish that they could show me the ECP the log entry where he went critical.

CHRISTOPHER: Your referring to the specific incident he's mentioned, Ok.

MEHLER: Yeah, you know, and whether I was there. Cause according to him I was. And to my...I cannot remember, I do remember an incident where were at 0 power and we were supposedly increasing at 3% an hour by a manuvering rate and after 2 hours we were still at 0% power and Mr. Hartman and I had words over that.

MARTIN: This was the one about the excessive alarms in the overhead.

MEHLER: No, the excessive alarms were previous to that.

MARTIN: I see.

MEHLER: And by the time the shift was over we got relieved and we were still at 0% power. But I don't know if that was the same day that he referred we went critical or not because I don't...I cannot remember if we went critical that day on our shift.

CHRISTOPHER: Do you know of anyway that we could research or find any record indication of this allegation he's making with regard to the ECP?

MEHLER: The only...there is a record in the log which at 10^8 you put your critical data down and with a procedure that you took it critical, the ECP is stapled to it, which is signed by one of the CRO's and one of the SRO's, you know, and if I was there my signature should be on it.

CHRISTOPHER: Ok, I have nothing further. Anything else, Brian that you would like to lay out to us at this time, about anything.

MEHLER: No, not really.

CHRISTOPHER: Ok. John any comments from you?

WILSON: No.

CHRISTOPHER: Ok. At this time we'll terminate the interview. The time is 10:38 and I'll reinterate we will provide you with a transcript and a copy... do you want a copy of the tape or transcript?

MEHLER: Transcript will be fine.

CHRISTOPER: Ok. We will make sure that you get a copy at your request then. Thank you.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

The purpose of this inquiry by the U.S. Nuclear Regulatory Commission is to investigate the concerns and allegations of a former control room operator from Three Mile Island, Unit #2, regarding safety and operational activities at this unit.

You are asked to provide information in as much detail as you can regarding these allegations and provide any recommendations you feel may be useful.

The U.S. Nuclear Regulatory Commission was given the responsibility and authority by the Congress of the United States in the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended, to licensee nuclear power plants and to see they are operated safely to protect the health and safety of the American Public. It is from this Act and Title 10, Code of Federal Regulations, that the U.S. Nuclear Regulatory Commission's Office of Inspection and Enforcement is conducting this official investigation.

You have the right to refuse to be interviewed. If you consent to an interview, you may have someone of your choice present. To assist in obtaining every comment, exactly as it is given, and to expedite the interview, your permission to tape record this interview is requested. You have the right to refuse to have the interview tape recorded. The U.S. Nuclear Regulatory Commssion investigators will prepare a written record of your statements and request you to sign it. You have the right to refuse to give a signed statement. In the absence of a tape recording or a signed statement, the U.S. Nuclear Regulatory Commission investigators will, to the best of their abilities, write your comments for inclusion in the investigative report. Upon your request you will be given a copy of your tape recording or signed statement.

You have the right to request that your identity be protected and not used in the U.S. Nuclear Regulatory Commission investigation report. However, because of the deep concern over this incident by the American public and government officials, the U.S. Nuclear Regulatory Commission cannot assure you that we will not release your name and interview contents if we receive official requests and requests by the public through the Freedom of Information Act. If specifically requested, all attempts will be made by the investigators to keep from disclosing to Metropolitan Edison or other parties specific information. You must recognize that this is not an absolute guarantee. Federal law prohibits your employer from discharging you or discriminating against you because of your interview with the U.S. Nuclear Regulatory Commission.

Your help and cooperation in providing information to the Nuclear Regulatory Commission will be appreciated.

Questions

1. Do you understand the above? yes [✓] no [ ]
2. Do we have your permission to tape the interview? yes [✓] no [ ]
3. Do you want a copy of the tape? yes [✓] no [ ]

Brian Mehler 3-27-80
SIGNATURE DATE

WITNESS R.C. Christopher 3-27-80 10:05 AM
SIGNATURE DATE

INVESTIGATOR
TITLE

WITNESS T.T. Martin 3/27/80 10:05 AM
SIGNATURE DATE

Section Chief
TITLE

R. Keith Christopher has identified himself to me as an investigator of the Nuclear Regulatory Commission, an agency of the United States, which is performing an investigation authorized by the Atomic Energy Act of 1954, as amended. I understand that any false statement made by me during this investigation may subject me to criminal prosecution under 18 USC 1001.

Bruce Hubbe 3.27.80
(interviewee signature)

WITNESS R K Christopher 3.27.80 10:05

18 USC 1001 Fraud and False Statements

1001. Statements or entries generally

Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or makes any false, fictitious or fraudulent statements or representations, or makes or uses any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

June 25, 1948, c. 645, 62 Stat. 749.

A8

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of:

IE TMI INVESTIGATION INTERVIEW

of

Jim Floyd
Operations Supervisor

Trailer #5
NRC Investigation Site
TMI Nuclear Power Plant
Middletown, Pennsylvania

March 27, 1980
(Date of Interview)

April 15, 1980
(Date Transcript Typed)

1
(Tape Number(s))

NRC PERSONNEL:

Keith Christopher, Investigator
Thomas Martin, Section Chief, Reactor Project Section 3
Don Kirkpatrick, Nuclear Engineer

CHRISTOPHER: The date is March 27, 1980. This is Keith Christopher, an Investigator for the Nuclear Regulatory Commission, assigned to Region I, King of Prussia, Pennsylvania. This afternoon we are located in Trailer #5, at the NRC Office complex located at Three Mile Island Nuclear Power Station. This interview is being conducted with Mr. Jim Floyd, who is the...what is your title Jim?

FLOYD: Anything you want to call me.

CHRISTOPHER: Operations Supervisor?

FLOYD: No. Not any more.

CHRISTOPHER: Ok. Also present in the room are three additional individuals who I'll ask to identify themselves and state their titles.

MARTIN: Tim Martin, Section Chief, Reactor Projects #3, Region I, USNRC.

KIRKPATRICK: Don Kirkpatrick, Nuclear Engineer, IE Headquarters, USNRC.

WILSON: John F. Wilson, Attorney, Metropolitan Edison Company.

CHRISTOPHER: Ok. Jim, a couple of the things we went over prior to going on tape that for formal purposes we would like just to take a moment and run over. Number 1 is the document we asked you to look over that covers the purpose and scope of our investigation and goes into the rights of the individuals being interviewed. On the last page there are several questions that I would like to get your response on tape, although you've indicated them there. Alright, Number 1 is, do you understand this two page memo which we've asked you to read and look over?

FLOYD: Yes sir.

CHRISTOPHER: Ok. The second question on the form reads, do we have your permission to tape this interview?

FLOYD: Yes sir.

CHRISTOPHER: Ok. And thirdly, it says would you like to have a copy of the tape?

FLOYD: Yes sir.

CHRISTOPHER: Ok, fine. Again the copy of the tape will be provided to you as soon as we can get it duplicated, probably sometime in the latter part of this week and we'll make sure that it gets back to you. Ok. Again if you could just give us a brief background Jim, of how long you've been with Metropolitan Edison at the Island here and what basically your position is now?

FLOYD: Well, I've been on the island with Metropolitan Edison since 1968 and I was supervisor of Operations for the shake down and the startup in the first year of commerical operation on Unit 1 and I held the same position on Unit 2 until last summer effectively, at which time Joe Chwastyk was promoted to the position of supervisor of operations and I became an engineer working on special projects.

CHRISTOPHER: Ok. Do you know Harold Hartman?

FLOYD: Yes.

CHRISTOPHER: Ok. Your background with knowing him is in relation with him being an operator for the Three Mile Island Station?

FLOYD: Yes.

CHRISTOPHER: Ok. My first area of concern Jim, that maybe you can enlighten us on, surrounds his termination or resignation from the company. Can you give us a chronology of what your involvement was with his initial resignation and the subsequent action that you know of that went from there?

FLOYD: As I remember, this is like the 30th of March last year days after the accident when we were working rather long and arduous hours and our minds were quite busy. I received a phone call, I believe at home from Hal and whether it was Friday night or Saturday night, more likely Saturday, but again that was the day I worked two different shifts split by 8 hours and the hours of that day are not real clear in my mind. But I think I was at home and I got a call from Hal somewhere around that weekend that he was resigning. Based on that telephone notification, I contacted our personnel department to see how we moved forward from that point. I believe it was the following Wednesday when Hal was scheduled to come to work having just finished the training week and he was on the B&W simulator with his shift and myself the week of the accident. He would traditionally return to the island or return to home Friday night from Lynchburg and his next scheduled work day would then be the following Wednesday at 7:00 in the morning. And I don't recall whether Hal came to work that morning or not, but I do recall that prior to his official termination, he was in and around the control room, however, we did not schedule him for "Licensed Operator

Duties" during that transition period between the time he had informed me of his resignation orally and the time that he was in fact, terminated, so although he was in and around the control room, we had him doing jobs such as recording data, watching things, but not really controlling anything.

CHRISTOPHER: Ok. One question that I had, on the night that he had called you at home and announced his resignation, did he give you a reason why he was resigning?

FLOYD: Yes, I'm sure he must have. I, you know, could've accepted a call like that without asking if he didn't volunteer the information and at the time I don't remember if he was upset or whether he was calm and collect. I don't remember what his demmeanor was nor do I remember precisely why he was resigning, whether it was for reasons of health or hopes to do better somewhere else. I just don't remember.

CHRISTOPHER: Was there any indication at that time that you can recall as to whether or not he was being forced to resign for any particular reason?

FLOYD: No, at that point in time we would've had no reason to ask for his resignation. Had he come back from the simulator and really come to work the following Wednesday morning he would've been license CRO in full standing as far as we were concerned because that was his next scheduled day to work.

CHRISTOPHER: When he...also when he talked to you that night, did you advise him to submit a written notice of termination?

FLOYD: I would imagine I would've done that because it's hard to work without something in writing.

CHRISTOPHER: When he came back on Wed...I think it was Wednesday because he had a four day weekend, is that when he said that he changed his mind, that he didn't want to quit?

FLOYD: I don't remember.

CHRISTOPHER: Ok. Do you know for a fact whether he did come in and did he actually did say, I change my mind, I'd like to rescind my resignation?

FLOYD: Had you not asked the question that way, had you been able to ask that piece of information in a nonleading direction, I probably would not have remembered that. Now that you've jogged my mind, maybe there's something faint back there, but it's not firm.

CHRISTOPHER: There was nothing that you were directly involved in in the procedural scense.

FLOYD: Oh, I could well have been, I just don't remember.

CHRISTOPHER: Ok, Ok. Is there anything else relative to his termination that you think we ought to know from your standpoint?

FLOYD: No, I don't believe.

CHRISTOPHER: Ok.

FLOYD: My mind is very weak in that area.

CHRISTOPHER: Ok. Do you have anything further Tim?

MARTIN: Ok Jim, I'd like to get into the area of one of Mr. Hartman's primary concerns. He was concerned that during the last three months of operation of Unit 2 that the safety valves were leaking excessively and that everyone knew that. Have you got any comments about that?

FLOYD: If he said he was concerned, I quess he was concerned. I can't tell you what was on his mind those last three months.

MARTIN: Ok, I think...

FLOYD: I can disagree with him, they weren't leaking excessively, they were leaking within the Technical Specification limit as far as we knew.

MARTIN: Alright, lets go on with the leak rate issue. He indicates that there was a great deal of pressure on the operators to get acceptable leak rates and in fact during the three month period you said it became increasingly difficult to get acceptable leak rates and he narrowed that into the unidentified leakage rate requirements. And he said that the computer wouldn't give you good results and they would repeat the calculations and sometimes they'd get good ones and sometimes they wouldn't and finally they developed little tricks, little techniques that gave them good results and each operator had his own. Were you aware that these operators were trying these little tricks to make the thing work?

FLOYD: No sir.

MARTIN: Mr. Hartman states that one of the ways he fudged the data was to increase the pressure in the makeup tank and that this would actually sometimes result in an acceptable leak rate. Are you aware of this?

FLOYD: No and from my knowledge of the leak rate procedure itself, I don't think that the makeup tank pressure enters the calculation. However, it might. I don't...my memory of that procedure is not strong enough at this point to say yes or no it enters the calculation and therefore it could effect the result.

KIRKPATRICK: Is there any reason why adding the makeup tank...hydrogen to the makeup tank would effect the leak rate calculation?

FLOYD: The pressures we're talking about the 515 40 pounds of pressure water is not very compressable and the only way that I can see it would effect the leak rate calculation is by the compressability of the liquid in the makeup tank which is very very small at those pressures.

KIRKPATRICK: Well is there anyway, for instance, that it could effect the level indication in the makeup tank?

FLOYD: I...it shouldn't, let me start there and say that it once was a wet leg we may have converted it to a dry leg level instrument, but if we did I think we executed that with a loop seal and so that the refer-

once leg of the level transmitter the DP cell that is the level transmitter still vented back to the tank and a properly calibrated DP cell is insensitive to pressure on both sides of it, so it should not have.

MARTIN: Mr. Hartman indicated that he himself was involved in at least three ways of fudging the data. One was increasing the makeup tank pressure, one was adding water during the running of the test and finally misstating the millivolt reading of the level indication on the RCDT. He felt that this information was known to his supervisors and in fact that he felt that he was under some pressure by those supervisors to get acceptable leak rates by fudging. Was there any pressure from management for them to do things like this?

FLOYD: Not from my level of management. And I might add, that adding water to the makeup tank is allowed by the leak rate calculation and is accounted for in the leak rate calculation and we thought it was properly accounted for but, in fact, I think it may not have been and as we may have been laboring under a misillusion for several months thinking we had good data when in fact, we didn't have good data. As for misstating the number on the millivolt meter which was indicative of drain tank level, yes, if you write down a number other than the one your reading then you are, in fact, falsifying data and that we would not knowingly tolerate.

MARTIN: Ok, now you referred to a possibility that the additions of water during the cycle may have been bad data. Is that associated with a miscalculation which was pointed out in the Office of Inspection and Enforcement investigation report?

FLOYD: Yes sir.

MARTIN: Ok and this is not something that was aknowledgeable error that was introduced by your operators?

FLOYD: No sir nor by our engineering staff, since they were cognizant on writing that procedure.

MARTIN: Taking some quotes from the interview that Mr. Ira Rosen, the reporter, had with Mr. Hartman he says things like, "I didn't do it very often, I did it only when I was watched very closely and was told I had to have one by 6:00 in the morning". Do you have any comment on that statement?

FLOYD: Nope, I wasn't present when it was made, I have no idea what was in the man's mind when he made it.

MARTIN: Has Mr. Hartman ever expressed concern to you about the leak rate calculation and possibly the pressure he felt for forging data?

FLOYD: I don't know that he did or he didn't. I had intimate contact with the CRO's in that control room everyday and we talked about many many things and I can't say with assurance yes or no to your question. I just don't know.

MARTIN: Do you have any other questions in this area?

KIRKPATRICK: Not right now, no.

MARTIN: Ok. The next area I'd like to go into is related to a estimated critical position calculation and a startup that occurred reportedly with Mr. Hartman as the CRO at the panel, Mr. Mehler as the shift supervisor, Mr. Hoyt as the Shift Foreman and Ray Booher as the other CRO. In that, the ECP was calculated as Mr. Hartman remembers approximately 68% on groups 6 or 7. A 1/2% down reactivity at 32% on that same group and in actuality he went critical at 28%, he noted that by an alarm rod inhibit a starter break which was either 2 or 3 decades per minute, he didn't remember which and he says he then implemented what he remembered the procedure required of inserting rods heading for the 1% shutdown position. The shift supervisor, he states said no, no take it to one, required him to do a startup and take the plant to 10^{-8} amps. Was this ever brought to your attention?

FLOYD: No sir.

MARTIN: Has this plant ver gone critical below the minimum level for criticality as computed by the ECP?

FLOYD: Not by a properly computed ECP. We have had multiple instances where the long and arduous calculation called an ECP, an estimated critcial position has had mathematical mistakes in it or a wrong input number, for instance like a wrong boron number and then of course you can pull for critical and you either don't achieve it by the time you get to your plus 5% or you go what you think is early. However, in all cases that I know of by merely going back to the ECP and checking the mathematics and the input data, the ECP is properly arrive at. There are some good equations in that procedure and they lead to valid results. So I no of know instance where this plant was taken critical outside the ECP, but because it had happened several times with ECP errors in them, it was not an extremely uncommon event and therefore if that was the case in this one it would be no reason for this one to stand out in my mind. However the ECP's are attached to the procedures and I do know that the three decade per minute startup rate on the source range is a rare occurrence and is recorded on the alarm typewriter. So if we can't get a date on when this supposedly transpired, we have to go back to the alarm typwriter and look over months of data and try to find the three decade per minute alarm which will be recorded on there if it was truely received as the man says and that would tell us which startup we're talking about, we could then go back into the procedures in the

plant and find that particular ECP and see if we were inside or outside that ECP and if...even possibly if there was a mathematical error on it. So I think this...there's plant history that will justify this allegation or deny it irrespective of what I remember.

MARTIN: Alright, you indicated that the thing that is recorded on the computer is a 3 dpm or could there be a lowered arm point?

FLOYD: No, on a source range it's at 3 dpm on the intermediate...Oops...no it's 2 dpm on the inter source range, 3 dpm on the intermediate range.

MARTIN: Ok, the 2 dpm would be logged on the alarm typewriter?

FLOYD: The alarm typewriter, I think, records that piece of information automatically. Also, the other control room operator's name that your speaking of is Ray Booher, not Boyer.

MARTIN: Thank you very much. What is the requirement if the plant goes critical below this 1/2% down reactivity point?

FLOYD: To do exactly what Hal Hartman said he was attempting to do, namely insert the control rods until you're 1% shutdown, until you reconcile the ECP.

MARTIN: Then, if the supervisor did direct him to continue the startup that would be a failure to follow procedures?

FLOYD: Only if the supervisor had not already reconciled the ECP. He may have been looking at that while the operator was withdrawing the control rods, he may have found the error and failed to inform the operator of it. So at the time of the situation took place he would be already knowledgable of the error in the ECP. Now whether that happened or not I don't know, I'm just saying that's a possibility.

MARTIN: Let me again quote this time from the reporter about Hartman. The reporter states, "Hartman stated that he was told to continue the plant startup even though this would violate procedures. He told the NRC investigators, "They redid the numbers and somehow they fudged them".

FLOYD: He doesn't conclusively justify the time frame that I was just referencing. Whether...he does not say what was in the shift supervisor's mind. He saw that he was being ordered into a position which was a procedural violation by the supervisor but it does not infer that the supervisor was making that same apparent error.

MARTIN: Don, do you have any questions on that one?

KIRKPATRICK: No, I don't.

MARTIN: Ok, the next area I'd like to go into is the emergency feedwater surveillance procedure, specifically the motor driven emergency feedwater functional test, once required monthly and Mr. Hartman's concern that this repeated performance of this test was very difficult to get it to come out the same twice and, in fact, they repeatedly changed the reference values for the test to make the data acceptable. Do you have any comments on this?

FLOYD: Well I know that we did have difficulty writing an acceptance criteria for that test and that is somewhat a matter of the philosophy which we have used inhouse on stating an explicit acceptance criteria which is either black or white. Either you meet it or you don't meet it. However, in the course of the months of the startup program, the power escalation program we had a continuously changing condition at the suction of that pump in that it normally takes suction from the condensate pump discharge water and therefore, as we went up higher in power level the pressure that was seen at the suction of the emergency feedpump was going down and therefore it's discharge pressure was going down and we had tried to write the acceptance criteria as a given a number of gallons per minute of recirc flow at a given pump discharge pressure. And if I lower the suction pressure in the pump I'm going to lower the discharge pressure and then I may not meet the discharge

pressure requirement that's in our acceptance criteria and although the pump is still performing quite adequately based on the pump head curve and had we not looked for black and white acceptance criteria so that the operator would know for sure that he was safe, had we instead referenced the pump head curve, then much of this trouble which we had with the acceptance criteria on the emergency feedpump would have gone away. And I think we can go back into PORC documentation and we can find that acceptance criteria was changed several times. If we just go a little bit further in the startup program to where we bring on a second condensate pump now all of sudden the pressure at the suction of the emergency feedpumps screams up in the air and so does discharge pressure screams up. And so then as you go up higher in power level the same phenomenon takes place. The discharge has a condensate pump rate drop off, the discharge pressure of the emergency feedpump drops off. And so this could have been repeated several times depending on when in the startup program the changes were made. But in all cases, that I can think of or remember, engineering was able to evaluate, based on the pump head curve, the satisfactory performance of that pump. Now this may have also been complicated with readability of flow meters, of recirc flows on the pump, of bearing cooling water flows on the pump and possibly even the sensitivity of the suction and discharge pressure gauges. So there maybe a half a dozen iterations on that procedure which are all part of the procedure history file on that particular procedure and why engineering had to go back in and keep

changing the acceptance criteria in the procedure, although the pump was still performing quite acceptably throughout. I don't think there was ever a question in my mind of the operability of the pump. It was always operating on its head flow curve. It was merely the acceptance criteria the procedure tried to pick a point on that head flow curve rather than any point on the head flow curve.

MARTIN: I get the impression that with a given flow rate the pump differential pressure would remain relatively constant.

FLOYD: That's true.

MARTIN: Yet I am told, in fact, Rev. 4 revises not only the differential and the flows but the discharge and the suction pressures.

FLOYD: And this was Rev. that was made in eight, August of 78.

MARTIN: It was of interest to us also that when we talked to Mr. Hartman he indicated that all four were subject to changes in reference value but not just the...

FLOYD: Well, there was a piping change made on the seals to these pumps as I remember where the seals or the bearing cooling water, one or both, were running to high and we had to enlarge the size of the lines going to the seals slash bearings and that would have taken some

of the flow away from the flow measuring device and could have lead to another change in the procedure. Now which one of the problems prompted this Rev. 4 to be issued I don't know, but the document...the history file on this document should explain the reasons for the change. So without looking at the history file I can't tell you why those changes were made.

MARTIN: Understood. Anyone else have any questions in this area?

SOMEONE: No.

MARTIN: Ok, the last area that I would like to address would be the handling of safety concerns surfaced by Mr. Hartman. He indicates that he surfaced a number of concerns to his shift foreman, to his shift supervisor and to his alternate shift supervisor which was Mr. Mehler in one case. His concerns were brought to the supervisors attention orally, they were never put in writing. Apparently, some of these may have had some substance. Others may have not. How should the supervisors have handled these and were you ever aware that a concern was being passed up the line to you?

FLOYD: I think I'll answer your last question first because that's the easiest one. No, I was not aware that there were safety concerns being passed up the line to me orally or anyother way. As to your first

question, How should the supervisor or foreman handled the situation. If it were as clear cut as 'Hey Mr. Foreman, here is a safety concern on this plant', then what you should do is fairly straight forward and that's basically turn it over to the PORC for nuclear safety evaluation. But, the foreman never has anything presented to him that clear cut and that straight forward. He has working for him six or a dozen men somewhere in between. And each one of those persons are a little bit different than the other one. And when one man comes up and says, "I think we might have an area...a problem in this area" he'd probably listen to him fairly carefully because he doesn't tell you something like that a half a dozen times a day. Another man might be a chronic complainer and might be continually on you about something, no matter how picky it may be and unless that man prefaces his remark, his current complaint with something like, 'Hey Mr. Foreman, here's a safety concern why it could very well go in one hear and out the other from a chronic complainer where as, in fact, a man whose just out there doing his job day to day the same words might mean a whole lot more to the man listening to them. So I can't answer how the foreman should have handled this particular instance. I say, if he was aware there was a safety concern then his guidance was clear cut, I think, and he would go directly to either his supervisor or go directly to the PORC. If his supervisor didn't give him any satisfaction on his concern, Hal, himself, would have been free to go to the PORC. The PORC is the nuclear safety

review body on this plant and to not avail yourself of them if you are, in fact, concerned just degrade your level of concern as far as I'm concerned.

CHRISTOPHER: Your saying he would have had no problem or had no reason to fear of going to PORC in regards to any problems that he felt were not being adeqately addressed. There was nothing to...no barrier that would stop him from going to that group?

FLOYD: No sir. The PORC is composed of the engineers basically, in the plant, and he's always free to talk...in fact he talked to them every day in the control room and if he wasn't sure of his position why he could have just, in this case, it might be a mechanical engineer he'd want to speak to, but if it was an instrumentation problem if could have talked to the I&C engineer. And just his talking to those people, which he probably talked to everyday anyhow, they probably would have recognized it as a safety concern if it was, in fact, valid. And his foreman represented no barrier to the man. His foreman doesn't control his rate of pay or anything else.

CHRISTOPHER: You may have answered this. Did he ever specifically come to you and say, hey look I've told Dick Hoyt this or Bernie Smith this or Brian Mehler this and it's a real problem and they're not doing anything about it. Did he ever come to you with any complaint like that?

FLOYD: I'd say, yes he did on a number of issues, all of which were probably petty, if not picky, to come up and say I've talked to them about this which is a possible nuclear safety concern. Hal didn't normally use that kind of language, but he was always unhappy about something and if I was in the control room for any length of time I would hear about it. But I know of no items of nuclear safety that he brought up that were not considered.

CHRISTOPHER: Anything that he brought to your attention if you thought it was worth while it was in some manner checked out for its validity then?

FLOYD: Yes. My easiest way was just, as I said before, for the operator to do it. Just call the cognizant engineer over, talk to him about it and if together we could agree that we had a problem or if we took different sides of the issue even, you take it to PORC for resolution. The PORC makes the determination or the recommendation to the Superintendent on items of the nuclear safety and so if he...if the engineer and I were... happen to disagree why we'd just take it to PORC for resolution and the PORC minutes are all documented, so.

CHRISTOPHER: Was there any one particular issue that you can recall, him bringing to your attention on a repeated basis or one that where you said you didn't take any particular note of any one of them because of there being...any one particular issue that was a repeated sore spot with him?

FLOYD: Not that concerned nuclear safety, no.

CHRISTOPHER: What would have been...can you give me just a rough sample of what kind of things he would have complained to you about?

FLOYD: The number of alarms in the control room. That was a constant soreness out of all the control room operators. It was one of the undesireable working conditions which they performed under. And, you know, it would not have been unusual for everyone of the CRO's to have spoken to me about that particular issue. And there's probably another half a dozen generic ones just like that. Maybe the temerpature in the control room was to hot or...in the summertime or to cold in the winter time or visa versa, but these items are very definitely not vital to nuclear safety unless you stretch your imagination tremendously.

MARTIN: Was Mr. Hartman regarded as a chronic complainer?

FLOYD: I would say, I think I personally regarded him that way. And sometimes some of his complaints were valid. Don't get me wrong, I didn't tune him out just because he complained alot, but compared to his cohorts I would say he was on the heavy side of the complaint list as opposed to the light side.

MARTIN: Was his job in jeopardy because he surfaced complaints or surfaced concerns?

FLOYD: No sir. That is not a valid reason for firing the man from this company.

CHRISTOPHER: Don, something else?

MARTIN: That's all I have.

CHRISTOPHER: Ok. Do you have any other issues that you want to talk about? Ok. Alright, Jim those are the issues that we wanted to cover. We'll open the floor up to you. Are there anythings that you want to throw out that maybe we didn't cover or that you think you'd like to tell us about or whatever?

FLOYD: No sir. Not that I can think of.

CHRISTOPHER: Ok. I have nothing else, Ok. At this time we'll terminate this tape. The time is 1:53.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

The purpose of this inquiry by the U.S. Nuclear Regulatory Commission is to investigate the concerns and allegations of a former control room operator from Three Mile Island, Unit #2, regarding safety and operational activities at this unit.

You are asked to provide information in as much detail as you can regarding these allegations and provide any recommendations you feel may be useful.

The U.S. Nuclear Regulatory Commission was given the responsibility and authority by the Congress of the United States in the Atomic Energy Act of 1954, as amended and the Energy Reorganization Act of 1974, as amended, to licensee nuclear power plants and to see they are operated safely to protect the health and safety of the American Public. It is from this Act and Title 10, Code of Federal Regulations, that the U.S. Nuclear Regulatory Commission's Office of Inspection and Enforcement is conducting this official investigation.

You have the right to refuse to be interviewed. If you consent to an interview, you may have someone of your choice present. To assist in obtaining every comment, exactly as it is given, and to expedite the interview, your permission to tape record this interview is requested. You have the right to refuse to have the interview tape recorded. The U.S. Nuclear Regulatory Commssion investigators will prepare a written record of your statements and request you to sign it. You have the right to refuse to give a signed statement. In the absence of a tape recording or a signed statement, the U.S. Nuclear Regulatory Commission investigators will, to the best of their abilities, write your comments for inclusion in the investigative report. Upon your request you will be given a copy of your tape recording or signed statement.

You have the right to request that your identity be protected and not used in the U.S. Nuclear Regulatory Commission investigation report. However, because of the deep concern over this incident by the American public and government officials, the U.S. Nuclear Regulatory Commission cannot assure you that we will not release your name and interview contents if we receive official requests and requests by the public through the Freedom of Information Act. If specifically requested, all attempts will be made by the investigators to keep from disclosing to Metropolitan Edison or other parties specific information. You must recognize that this is not an absolute guarantee. Federal law prohibits your employer from discharging you or discriminating against you because of your interview with the U.S. Nuclear Regulatory Commission.

Your help and cooperation in providing information to the Nuclear Regulatory Commission will be appreciated.

Questions

1. Do you understand the above? yes [✓] no [ ]
2. Do we have your permission to tape the interview? yes [✓] no [ ]
3. Do you want a copy of the tape? yes [✓] no [ ]

James R Floyd 3/27/80
SIGNATURE DATE

WITNESS R.K Christopher 3-27-80 1:15 PM.
SIGNATURE DATE

INVESTIGATOR
TITLE

WITNESS T.T Martin 3/27/80
SIGNATURE DATE

Section Chief
TITLE

R. Keith Christopher has identified himself to me as an investigator of the Nuclear Regulatory Commission, an agency of the United States, which is performing an investigation authorized by the Atomic Energy Act of 1954, as amended. I understand that any false statement made by me during this investigation may subject me to criminal prosecution under 18 USC 1001.

James R. Floyd 3/27/80
(interviewee signature) 1315

18 USC 1001 Fraud and False Statements

D. Mast 3/28/80
R.K Christopher 3/27/80

1001. Statements or entries generally

Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or makes any false, fictitious or fraudulent statements or representations, or makes or uses any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

June 25, 1948, c. 645, 62 Stat. 749.

A9

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of:

IE TMI INVESTIGATION INTERVIEW

of

Kenneth Hoyt, Shift Foreman

Trailer #5
NRC Investigation Site
TMI Nuclear Power Plant
Middletown, Pennsylvania

March 27, 1980
(Date of Interview)

April 15, 1980
(Date Transcript Typed)

2
(Tape Number(s))

NRC PERSONNEL:

Keith Christopher, Investigator
Thomas Martin, Section Chief, Reactor Project Section 3

CHRISTOPHER: The date is March 27, 1980, the time is 8:01 a.m. This is Keith Christopher, I am an Investigator with the U.S. Nuclear Regulatory Commission assigned to Region I, King of Prussia, Pennsylvania. This morning we are located in Trailer No. 5 of the Nuclear Regulatory Commission Office complex at the Three Mile Island Nuclear Power Station. We are here to conduct an interview with Mr. Kenneth Hoyt who is a Shift Foreman employed by Metropolitan Edison. At this time I would like the other NRC individual in the room to identify himself and his position.

MARTIN: Tim Martin, Section Chief, Reactor Project Section 3, Reactor Operations and Nuclear Support Branch, Region I, USNRC.

CHRISTOPHER: Okay, I would like to make formal reference, it is Kenneth Hoyt. Right? Okay. Ken, we are here to talk to you this morning about an individual who was formerly employed by Met Ed as a CRO by the name of Harold Hartman. Do you know Harold Hartman?

HOYT: Yes I do.

CHRISTOPHER: Okay, could you briefly tell us how you know Harold Hartman.

HOYT: Harold Hartman used to work as a Control Room Operator on my shift.

CHRISTOPHER: Okay, how long have you been a shift supervisor, Ken? Approximately.

HOYT: Oh, my goodness, 77, 76 or 77.

CHRISTOPHER: And how long was Harold Hartman working for you?

HOYT: I think it was sometime in 78 that he first started.

MARTIN: Okay. It's Ken, right.

HOYT: I go by Dick.

MARTIN: Dick, okay. Dick, I've four areas that I want to ask you some questions. The first one is associated with emergency feedwater pumps surveillance tests. This is a copy of one of the tests, I refer to Rev. 5 of 2303-M27A and B, C Operational Test among other things the motor driven feedwater pumps. In discussion with Mr. Hartman he has some concerns about the way the test was conducted and the frequent changing of the reference values. Do you have any comment relative to his concerns.

HOYT: Well I don't know what he said to you so I don't really know what his concerns were. Do you want to enlight on some of them and ask direct questions, I will give you my opinion.

MARTIN: All right Dick. One of his concerns was that the test frequently could not be passed and that the information had to be provided the ISI coordinators who would then recompute new reference values and analyze the problem away and that almost every time he saw the test it had new reference values.

HOYT: Well I'll have to agree to a certain extent there, yes we did have problems, initial setup where we used an equalizer DP cross to check flow rates to a recirc line on these pumps and check out the flow rate. It seemed more the problem of duplicating every instance of the tests to, you know, come up with acceptable data, so we would run our tests as close as we could to the initial data and then if we could not, you know, fall within the proper range, we would write down the data we had taken, we would send it to ISI engineer and say this is as close as we car duplicate, this is what we got, is this satisfactory. And they would of course sit down, reanalyze and make their calculations and they would come back and say whether it was good or not.

MARTIN: Dick, why was it so difficult to get the test to come out the same twice.

HOYT: Changing pressure throughout the system, suction pressure, different instruments that we might use from one time to the next, you couldn't always say that I would use the same test instrument that I use this time the next time because we have several of them and some would be out for calibration, we would be using another one. So there is a possibility that, you know, one gauge slight error into it, I don't really know as far as the gauges go, I can't find anything to say yes there was an error in the gauge. I know we did use different gauges. It is a possibility that I cannot say yes or no.

MARTIN: Dick, relative to the changes in reference values, were you ever provided an explanation of, a logical explanation of why those reference values continually changed.

CHRISTOPHER: That would probably be somebody, maybe ISI.

HOYT: Yes, I am just trying to get back in my mind. I talked to the ISI engineers several times when we did have problems and I would have to say each time that I had any questions, I did have a satisfactory answer. When they came up and showed me, like just the difference in suction pressure, the difference in back pressure maybe, something like this here where some of the calculations are. I can never recall right off the top of my head of ever having a question that wasn't to my satisfaction a satisfactory answer.

MARTIN: All right Dick, I would like to leave that area and move in to the RCS inventory test. Mr. Hartman's concern relates to the fact that it became very difficult in the later stages of the plant operation, Unit 2 operation, to get a acceptable leak rate and do you have any comments about that.

HOYT: I'll agree we did have problems getting acceptable leak rate by the computer. But as, how do I say this, the calculations in the computer itself were not really I would have to say the best reference data to be used to get accurate leak rates. Because of this fact we did have problems. What I am saying about the computer really is something that come up a little later after we were having the problem that they went looking at all the calculations and found the computer to be somewhat inaccurate. I don't know what else you want to know on that.

MARTIN: Dick, which ones of the leak rate technical specifications were causing you a problem.

HOYT: The one dpm leak rate, not to exceed 1 dpm.

MARTIN: This is the unidentified leak rate. How frequently was this test performed.

HOYT: It's a three day requirement that we have an acceptable leak rate by Tech Specs. We run it on a shiftly basis. We try to on every shift its a routine operation to ask the computer for a leak rate and to get that out each shift.

MARTIN: Dick, what would you do when the computer would come out with a leak rate that was in excess of limits.

HOYT: We would look at the plant to see if there were any instabilities in the plant such as temperature changes, power changes, which throws your inventories off, and go back and ask the computer to recalculate another one.

MARTIN: What if there were no obvious reasons why the calculation was in the error, you know, that there was no logical explanation for invalidating the data. What would you do then?

HOYT: Still go back and ask the computer to give me another one. Like it's about anything, one by itself does not really mean anything, you got to have something to back up whatever you do safe. So you always go back and re-ask, re-evaluate, re-calculate, whatever, if something comes out in error.

MARTIN: When you found one that was in error or gave an unacceptable result, did that kick you into an action statement.

HOYT: Not unless we exceeded the three day time clock on the Tech Specs.

MARTIN: Okay, I'll refer you to a section of the Technical Specifications relative to surveillance tests and frequency of conducting them. First to the 403 which I think you are referring to that would allow you 72 hours or appears to allow you 72 hours between them.

HOYT: That's what I'm referring to, yes.

MARTIN: All right, now I will refer you to the basis for 403 and I want you to take note specifically of the last statement in that paragraph. (Pause) In light of that last statement, how do you justify not entering that action statement as soon as an unacceptable result is found that you can't invalidate it in a logical manner.

HOYT: Well each one that we had in excess of our one, they were always looked at and some type of, how I'll say, evidence saying that, you know, that an invalid computer printout, not that the system actually was exceeding the one dpm leak rate.

MARTIN: Dick, when were hand calculations performed?

HOYT: When? Hand calculations were made when we got into surveillances greater than one where we didn't have explanations for, they would do hand calculations to back up what the computer said to try and find out if the computer itself was, how do I say, miscalculating some parameter that it was looking at to make a verification that we were greater than the one gpm or not greater. Also, if we were down to our three day limit and we had not been able to get the computer to give us an acceptable limit, hand calculations were done then to see if we were greater or less than our one gpm leak rate.

MARTIN: Dick, Mr. Hartman has indicated that some of the data was fudged and in discussion with him, he indicates that in some instances wrong millivolt values were inserted into the computer representing the reactor coolant drain tank level. In other cases, nitrogen or excuse me, hydrogen pressure in the top of the makeup tank was increased, in another case demineralized water was added to the makeup tank by running the transfer pump and just cracking the valve. He indicates that these were done because of the pressure which he felt to get acceptable leak rates. Do you have any comments on that?

HOYT: All I can say then is Mr. Hartman has some knowledge that I am not aware of, because I never did or see anything like that.

CHRISTOPHER: Do you think that the operators would be able to do these type of tricks as he calls them without your knowledge.

HOYT: I would have to say yes because I was not always, you know, there looking over their shoulders to see what they were doing. I had other jobs to do, I had to be out in the plant, but with my crew I never had any lack of communications and I don't think, okay, that they would have done anything like this, but I'll say "Hey Dick, we got a good one, here this is what I had to do to fudge it but we got it." I just don't think that would have happened.

CHRISTOPHER: Speaking of your crew, who were the other individuals in the crew, the other operators.

HOYT: I had Raymond Booher, who was my other licensee CRO, and Hal Hartman and I had John Blessing, who was a trainee.

CHRISTOPHER: Do you feel that there was a sufficient competition between the shifts to get these good rates that it would cause the guys to feel the pressure was there to fudge the calculations or to fudge the statistics so that everything appeared to be acceptable. Was there that type of inter-shift competition.

HOYT: I don't think so.

MARTIN: Dick, I'll refer you to a section of a transcript between Mr. Ira Rosen and Mr. Hartman and let me quote from it. "There were certain things, like something simple, like adding hydrogen to the makeup tank, it's a gas to prevent oxidation in the coolant pipes." Reporter: "Did you ever fix this statistics?" Hartman: "I didn't do it very often. I did it only if I was watched very closely and was told that I had to have one by 6:00 in the morning. It was a dire situation. I avoided it."

HOYT: My comment there again is, Harold's got something I don't know about. I can say honestly that probably I have told him that -- hey, we've got to get one before the end of the shift, but I have never told him to do anything to make it illegal leak rate.

MARTIN: Dick, when you said we got to get one by the end of the shift, what were you trying to tell him.

HOYT: Well like I said earlier, we -- each shift would try to get a leak rate out of the computer, okay, and let's say, coming towards the end of the shift and we didn't have our leak rate yet, I could very likely have said -- hey Hal we need to have a leak rate before the end of the shift. But I never, like I said before, I never pushed to get anything that was illegal.

CHRISTOPHER: Just to reiterate, you know no instance where any of the operators in your shift has deliberately fudged those calculations in order to get an acceptable reading.

HOYT: No sir.

MARTIN: All right Dick, I would like to leave that area if Mr. Christopher has no further. Next area is relative to an event which Mr. Hartman alleges occurred. Let me bring you up to speed on it. He clains that it was startup on which, I believe you were present and Mr. Mehler was the acting shift supervisor. The estimated critical position had been calculated, his memory says that it was 68% on Group 6 and 7, the 5% or 1/2% down was 32% and I don't remember what the 1/2% up. He says he was doing the startup, he received an alarm rod outmotion inhibit, he looked up, he had a 3 dpm startup rate, he started inserting rods, he was at 28% on the group that was below the 5% down, he interpreted the procedure to require him to insert rods to the shutdown banks so that he had the 1% shutdown. He says that the supervisor said no, no, take it to 1, in fact required him to continue the startup. Do you have any comments on this event?

HOYT: No off the top of my head, I don't remember anything like that.

CHRISTOPHER: He had given us information, Dick, in a sworn statement, that Brian Mehler did tell him to, to continue the startup which adds a certain amount of credibility to the information he is relaying. He also feels and to the best of his recollection that yourself and Ray Booher who was the other operator on the shift at the time recalculated the ECP figures as a result of that and if you could just tax your memory a little bit about that and give us a justification for why it was done that way. I realize we are asking you to stray back into a lot of time but apparently for Brian Mehler it was on an unusual occurrence for Brian Mehler to be on this shift with your people, so maybe if you can just limit, you know, those areas, you can come up with this particular incident.

HOYT: I still don't recall any such incident and only a couple of times that I recall that I worked with Brian Mehler and right off the top of my head wha I can remember from that we weren't doing any startups. I may he wrong, but I can't, you know, say off the top of my head I can't recall anything.

MARTIN: Dick, have you ever been in on a startup that you went critical below the lower band and had to recompute the ECP?

HOYT: Not that I recall.

CHRISTOPHER: Dick, Mr. Martin has explained what Harold Hartman explained happened during that incident. Is that to your knowledge is that procedure, if it did in fact happen that way, would that be a correct procedure.

HOYT: To shut down 1%.

CHRISTOPHER: Right.

HOYT: Yes sir.

CHRISTOPHER: That is, that would be your understanding of the procedures, that would be correct.

HOYT: Yes sir.

MARTIN: If you have no further questions I want to go to the last area. The last area is relative to Mr. Hartman's expressing safety concerns. He indicated that he informed his supervisors of his concern about the leak rate test, about the procedural problems with the emergency feedwater system with design problems on equipment in the plant, this ECP item, the fact that some people were not complying with procedures. Was any of this communicated to you orally.

HOYT: I really don't know how to answer that one. Mr. Hartman always had something to gripe about. Okay, I don't care whether from a shoe string being untied to the fact he had to come to work on a mid-shift, okay, and so to the best of my knowledge I could say probably some place along the line yes he did express verbally.

MARTIN: Was there any substance to his concerns.

HOYT: Some of them, yes. I can't recall anything in particular. Okay, but it was concerned with a lot of people, and I am sure he had the same concerns as everybody else.

MARTIN: When an operator brings to you a concern which you regard has substance, what do you do with it.

HOYT: We have what we call the problem report, the problem report would be filled out, sent to the -- at that time everything went to the startup engineers for their evaluations and I can't really give you a flow path from there where it went.

CHRISTOPHER: Do you have any recollection of any problem sheets being submitted as a result of complaints or concerns mentioned by Hal Hartman.

HOYT: Do you mean specifically by him. No.

CHRISTOPHER: Okay.

MARTIN: Dick, was Mr. Hartman regarded as a chronic complainer and was his job in jeopardy because he was expressing his concerns.

HOYT: I wouldn't say in jeopardy because of any concerns, but his job was in jeopardy because of his attitude which was very hyper, he flew off the handle very easily. He threatened to quit multiple times. He would refuse, he used to get all upset and refuse to even want to do anything. In general, all I can say is Hal had a very poor attitude for work.

MARTIN: Dick, as I understand it, the problem report would be something that a piece of equipment has failed or it needs modification or something like that, but does the company have any other mechanism for surfacing concerns about design or compliance with procedures or whatever.

HOYT: I am not sure really what you asking.

MARTIN: Do they have a suggestion system or way to get to top level management and say - Hey, here's a concern people are not handling.

HOYT: I guess you could just write up a simple report and start it right up through the chain, through your supervisor and department heads, etc, right on up. There was no problem with that, the safety reports, like I said, you could write down anything you wanted there, it didn't necessarily have to be specifically equipment, it could be anything you felt was a safety problem and that would be some sent on thru. And reports would be wrote up on.

MARTIN: Dick, have you ever received one of those?

HOYT: Did I ever receive one?

MARTIN: From one of your men.

HOYT: I can't recall receiving one, I can recall writing up some.

CHRISTOPHER: I have another question, Dick, we're going back to specific working problems that Harold may have had in the control room. He recited to us one instance in which he feels that he may have been threatened with, whether it was directly or indirectly, he felt that he may have faced the possibility of being fired and again the result was a confrontation of sort between himself and Brian Mehler. Again you may or may not have been in the control room. During this particular

instant, they were, according to Hartman, they were in the process of a startup, they were doing a lot of things and they were having a lot of trouble with nuisance alarms continuing on and on and that at one point Hal was upset about the nuisance alarms. It was apparently affecting his concentration. He asked Mr. Mehler if he could do something about the alarms and apparently wasn't satisfied with the answer he got from Mr. Mehler and asked him for a relief. According to him, Mr. Mehler said, well if you want to relieve, you may as well pick up your lunch bucket and head out the North Gate, which he interpreted as meaning he would be fired if he didn't continue working. Does that incident come to your mind for any reason or have any indication that maybe you may have been involved to some extent in trying to get him relieved on this particular incident.

HOYT: Just very vaguely I can remember something along them lines. Okay, I can't say that it was an alarm, okay, but there was something vaguely in the back of my mind I can't really pull any details on it along that line. But like I said before, he threatened to quit several times, I looked for a relief so he could quit and go and maybe this is one of those instances. I don't know, I just can't really pinpoint anything on that.

CHRISTOPHER: Was there a working relationship problem between Harold Hartman and Brian Mehler. Did they have trouble getting along?

HOYT: I think Hal had a problem with everybody.

CHRISTOPHER: Okay, but specifically with regard to Brian Mehler. You were normally, you and Bernie Smith were the normal crew supervision team and Brian Mehler was the fill-in on one or two occasions.

HOYT: Yes.

CHRISTOPHER: Does it strike you that there was a personality conflict between the two individuals, that they had a, do you want to call it a running battle going on.

HOYT: I don't really know how to answer that, because

CHRISTOPHER: That's an opinion, I guess.

HOYT: Yes, you're asking for something I can't really answer. I know they had problems whether it was a running battle problem or not I can't answer that.

MARTIN: Are you through there, Keith. I have one final question. On the leak rate area, when an unacceptable result was recorded on the computer what was done with that record.

HOYT: Usually the record was destroyed.

MARTIN: What was the basis for destroying that, that record.

HOYT: By seeing some parameter that you knew had changed and made it come out greater than one.

MARTIN: Were you directed to destroy records that weren't, that didn't pass.

HOYT: Yes.

MARTIN: Who gave you that direction.

HOYT: It normally comes from supervisors.

MARTIN: Which would be the shift supervisor, whoever.

CHRISTOPHER: Is that considered as standard operating procedures, to destroy those. Is there anything wrong with destroying those records of test failures.

HOYT: I don't feel there is anything wrong with it if you got justification saying hey this data is no good. and I am not aware of any reasons that you can't destroy it.

MARTIN: I have no further questions.

CHRISTOPHER: Okay, Dick, at this time I know you want to get out of here and go home. Do you have anything that you would like to bring up to us in regard to the interview about Harold Hartman which you feel you would like to add to on that matter or anything else while you have got us here. For the next couple of minutes will be yours if you would like us to listen. Anything at all.

HOYT: I really don't think I have to say anything. I think Mr. Hartman pretty much said, how do I say this, pretty much sold the picture of himself. It is just a m[illegible]er of somebody sitting down and analyzing and see what type of man he was and when I worked with him I tried to keep things on a smooth basis cause if I could keep him calmed down I could get production out of him but as soon as he started getting hyper he was essentially no good to me and you just can't work that way.

MARTIN: Okay, any other area that you would like to cover with us Dick before you go. Anything you want to bring up to us. On any matter related to the plant.

HOYT: Not officially.

CHRISTOPHER: Okay. At this time we'll say thank you very much and going to end the tape and the time is 8:32, okay.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

The purpose of this inquiry by the U.S. Nuclear Regulatory Commission is to investigate the concerns and allegations of a former control room operator from Three Mile Island, Unit #2, regarding safety and operational activities at this unit.

You are asked to provide information in as much detail as you can regarding these allegations and provide any recommendations you feel may be useful.

The U.S. Nuclear Regulatory Commission was given the responsibility and authority by the Congress of the United States in the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended, to licensee nuclear power plants and to see they are operated safely to protect the health and safety of the American Public. It is from this Act and Title 10, Code of Federal Regulations, that the U.S. Nuclear Regulatory Commission's Office of Inspection and Enforcement is conducting tnis official investigation.

You have the right to refuse to be interviewed. If you consent to an interview, you may have someone of your choice present. To assist in obtaining every comment, exactly as it is given, and to expedite the interview, your permission to tape record this interview is requested. You have the right to refuse to have the interview tape recorded. The U.S. Nuclear Regulatory Commssion investigators will prepare a written record of your statements and request you to sign it. You have the right to refuse to give a signed statement. In the absence of a tape recording or a signed statement, the U.S. Nuclear Regulatory Commission investigators will, to the best of their abilities, write your comments for inclusion in the investigative report. Upon your request you will be given a copy of your tape recording or signed statement.

You have the right to request that your identity be protected and not used in the U.S. Nuclear Regulatory Commission investigation report. However, because of the deep concern over this incident by the American public and government officials, the U.S. Nuclear Regulatory Commission cannot assure you that we will not release your name and interview contents if we receive official requests and requests by the public through the Freedom of Information Act. If specifically requested, all attempts will be made by the investigators to keep from disclosing to Metropolitan Edison or other parties specific information. You must recognize that this is not an absolute guarantee. Federal law prohibits your employer from discharging you or discriminating against you because of your interview with the U.S. Nuclear Regulatory Commission.

Your help and cooperation in providing information to the Nuclear Regulatory Commission will be appreciated.

Questions

1. Do you understand the above? yes [✓] no [ ]
2. Do we have your permission to tape the interview? yes [✓] no [ ]
3. Do you want a copy of the tape? yes [✓] no [ ] written transcript only

K R Hoyt
SIGNATURE

3/27/80
DATE

WITNESS R K Christopher
SIGNATURE

3-27-80
DATE

INVESTIGATOR
TITLE

WITNESS
SIGNATURE

DATE

TITLE

R. Keith Christopher has identified himself to me as an investigator of the Nuclear Regulatory Commission, an agency of the United States, which is performing an investigation authorized by the Atomic Energy Act of 1954, as amended. I understand that any false statement made by me during this investigation may subject me to criminal prosecution under 18 USC 1001.

K R Hoyt 3/27/80 0800
(interviewee signature)

WITNESS:
R. K. Christopher 3/27/80 0800
K. Mark 3/27/80 0800

18 USC 1001 Fraud and False Statements

1001. Statements or entries generally

Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or makes any false, fictitious or fraudulent statements or representations, or makes or uses any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

June 25, 1948, c. 645, 62 Stat. 749.

A10

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of:

IE TMI INVESTIGATION INTERVIEW

of

Bernie Smith
Shift Supervisor

Trailer #5
NRC Investigation Site
TMI Nuclear Power Plant
Middletown, Pennsylvania

March 27, 1980
(Date of Interview)

April 15, 1980
(Date Transcript Typed)

2
(Tape Number(s))

NRC PERSONNEL:

Keith Christopher, Investigator
Thomas Martin, Section Chief, Reactor Projects Section 3
Don Kirkpatrick, Nuclear Engineer

CHRISTOPHER: The date is March 27, 1980, the time is 0905. Again this is Keith Christopher and I am an Investigator with the U. S. Nuclear Regulatory Commission assigned to Region I, King of Prussia, Pennsylvania. This morning we are located in Trailer No. 5 at the NRC Office complex at the Three Mile Island Nuclear Power Station. This interview is to be conducted with Mr. Bernie Smith who is an employee with the Metropolitan Edison Company. I will ask the other personnel in the room to identify themselves by name and also identify their position.

MARTIN: Tim Martin, Section Chief, Reactor Project Section 3, Region I, USNRC.

KIRKPATRICK: Don Kirkpatrick, Nuclear Engineer, IE Headquarters.

WILSON: John F. Wilson, Attorney, Metropolitan Edison Company.

CHRISTOPHER: Bernie, just before we turned on the tape, we as a matter of record we went through a couple of documents explaining to you the parameters of what this investigation was for, what the scope of the investigation was and also to the extent what the rights of the individual were who is being interviewed. For the record I will just, you know, restate a couple of questions to you and ask you to answer them on the tape. No. 1, did you understand the two-page memo which you read.

SMITH: Yes.

CHRISTOPHER: Okay, and the second question reads do we have your permission to tape the interview.

SMITH: Yes, you do.

CHRISTOPHER: Thank you. And thirdly do you want a copy of the tape.

SMITH: Yes.

CHRISTOPHER: Okay, and for the record as soon as the tape can be copied, it will have to be done back at the region, we will forward you a copy via mail or courier as they come back here. So you will get that. Okay let it also be noted that Mr. Wilson is a representative with Metropolitan Edison Legal Devision. Okay. All right Bernie if you would just quickly give us a little background. Do you know Harold Hartman.

SMITH: Yes I do.

CHRISTOPHER: Okay could you give us a brief description under what circumstances and how you know Harold.

SMITH: Well he is a CRO on my shift.

CHRISTOPHER: For what period of time would we be talking about. Roughly, one year, two years?

SMITH: At least two years I don't recall, you know, because he was an aux operator then he became a CRO.

CHRISTOPHER: The shift foreman would have been who.

SMITH: At that time Dick Hoyt.

CHRISTOPHER: Dick Hoyt, okay.

MARTIN: Tim Martin, I have four areas I would like to explore. The first is relative to the emergency feedwater surveillance test. Mr. Hartman has indicated a concern how the test is performed and the need to frequently change the reference values. The particular test he is referring to is 2303M27A and B, the surveillance procedure for motor driven emergency feedwater pumps and he informs us that the test never could come out, never came out the same twice. He also indicated that finally when they were unable to meet the acceptance criteria that it would be forwarded down to the ISI coordinators who would analyze the problem away and the procedure would be changed, they would have new

reference values and this continually occurred. Are you knowledgeable of this? Was it discussed with you by Mr. Hartman and do you have any other comments about it.

SMITH: Off the top of my head I don't know the particular surveillance. I don't recall changing the reference data. You would have to look, you know, we have all the data sheets up there in the file from 77, 78, 79, you know, I would have to go back and look at the reference, say you know, the ISI evaluates any pump valves stroke. If it doesn't meet acceptance criteria, that is on the procedure at the time, it then goes to the ISI department and they evaluate the data and maybe the procedure is changed, not saying that can't be done, nothing wrong with that, still within the scope of the pump, you know, the pump is suppose to pump 200 gallon a minute, you know, they have a certain safety margin either way they can go, you know, there is tolerances on every thing. I don't know if that particular one they changed. We have, you know, we have records in the control room to justify that.

MARTIN: Bernie for those that you noticed that reference values had been changed were you ever offered logical explanations for why they were changed.

SMITH: On the Emergency feed pumps.

MARTIN: Specifically, but you may have some other examples.

SMITH: I would say no to that.

MARTIN: No that they were not logical or no you weren't provided explanations.

SMITH: I was not provided explanations.

MARTIN: Keith, do you have any other areas.

CHRISTOPHER: Would it be unusual for you not to be provided an explanation. Would that be something that you would expect to be received by somebody in a position such as Ken Hoyt who was your shift foreman.

SMITH: No I don't think he'd do that either. Okay, it is sent to the ISI department who, you know, have all the books and data and, you know, the margins and stuff like that. I never, you know, unless there was a big discrepancy, you know, I wouldn't question it.

CHRISTOPHER: I don't have anything else.

WILSON: Bernie, excuse me, what was the procedure reference number.

MARTIN: The procedure reference number would have been 2303-M27A and B, Rev. 5, and that's what I happen to have but early revisions are also the same. The next area I would talk to you about is the RCS inventory test which we are informed is run a minimum of every three days. Mr. Hartman has expressed a concern that the leakage rates were increasing with time, particularly during the last three months and that it became increasingly difficult to get a acceptable leak rate. Do you have any comments on that.

SMITH: Well, when this all started, okay, I also went back and checked all the surveillances 2303301, I think that's the number, is it. Yea, 2301 okay in that procedure we checked all our files up there and we have never exceeded one gallon a minute in the three days. We have always complied with the Tech Specs, less than one gallon a minute every three days.

MARTIN: Bernie, it is my understanding that the computer would come out with unacceptable results and when those results were found they were, they were crumbled up and thrown in the trash.

SMITH: That is true.

MARTIN: What is the basis for doing that?

SMITH: Because you were looking for a leak rate of 1 gpm in a 80,000 gallon system. Parameters of the plant change all the time, computer only knows one calculation and it goes through all the parameters, comes out and if we have greater than 1 gallon leak rate, what we would do is recalculate cause we run leak rates every shift.

MARTIN: All right Bernie, I've got in front of me a copy of the Technical Specifications 3462, which one of the leakages was the one of concern, which one was causing the problems in passing.

SMITH: B, okay that's one gallon a minute, only thing that's on the leakage here.

MARTIN: All right, given that that is the Technical Specification, what gives you 72 hours to get a good one.

SMITH: I can't answer that. What gives me 72 hours.

MARTIN: You get an unacceptable leak rate on the computer.

SMITH: That's right.

MARTIN: Why don't you have to immediately leap into the action statement.

SMITH: The action statement here is (pause refers to Tech Spec) cause Section D of the surveillance which that 301 is, tells me I have 72 hours.

MARTIN: Okay, read those words specifically that you see right there.

SMITH: Performance of a reactor coolant system water inventory balance at least once per 72 hours during steady state operation.

MARTIN: Now let's go to the basis for surveillance procedures. I want to call your attention to 403.

SMITH: (Pause) Okay I read it.

MARTIN: And that's the thing that gives you the 72 hours?

SMITH: Yea.

MARTIN: Okay, I'll show you the basis now 403 and I call your attention to the last sentence in the paragraph. Given that last sentence which states -nothing in this provision is to be construed as definirg equipment systems or components operable when such items are found or known to be inoperable although still meeting the surveillance requirements. Given that last sentence, what justification do you have of throwing away records which show unacceptable leak rates.

SMITH: My interpretation is the Tech Spec for leak rate is you have 72 hours to find a good leak rate. You know, and that was reviewed by our PORC, you know, that's their job is Tech Specs.

MARTIN: Let me provide my explanation. This is an incorrect interpretation. Once you find a system wrong even though you are within the 72 hours, that last 72 hours, the one you said is good is gone, that's no longer important. You're now in the action statement, you're not doing something within that six hours that shows an acceptable leak rate, then you must take the required action and you have the references now. Okay, let's go on with Mr. Hartman's concerns. He indicates that there were.

WILSON: I was talking to Bernie Smith yesterday on behalf of the company to try to understand Mr. Hartman's comments. At that time Mr. Smith gave me a narrative description of the evolution of getting a bad leak rate from the computer and the meaning of that and I think it might be better than a question and answer method here, if he could explain in narrative what he sees as a meaning of a bad computer leak rate because of the computer deficiencies, as whether or not that really is a bad leak rate.

CHRISTOPHER: Mr. Smith, do you want to lead into that?

SMITH: I guess I don't understand the questions.

MARTIN: Bernie, let me clarify. What would happen that would invalidate one of these leak rates and would allow you to throw away one that you felt was not correct.

SMITH: Since we are looking for such a small amount of leakage, okay, temperature changes and pressure, secondary side and the generator, turbine, you know, can invalidate a leak rate very easy because, you know, one degree change in the primary system is worth, as I remember like, a hundred gallons of water and, you know, the plant really doesn't run that stable to maintain a constant temperature all the time at a constant pressure. That's why we just don't accept every leak rate. You could run a leak rate, you know, and you could get a 45 gallon a minute leak rate, okay, 45 gallon leak rate is very easy to see because it is a closed system, you can see down the makeup tank, you know, so of course we threw away because we knew it wasn't, you know, the computer, the guy had made up to the system or something, you know, it just wasn't real. So at that time, of course, we would run another one.

MARTIN: Okay, I would like to go on with some of Mr. Hartman's statements. In fact, let me now pull one out of his interview with Mr. Ira Rosen, a New York reporter. In there he states, and I've got to find this. Okay, in here he states that he actually tampered with a leak rate

test results. There were certain things we could do to make it less than 1 gallon per minute. The reporter asked him what did you do? And he says "like something simple, like adding hydrogen to the makeup tank." And the reporter subsequently asked him "did you fix the statistics?" Hartman says "I didn't do it very often. I did it only if I was watched very closely and I was told I had to have one by 6:00 in the morning. It was a dire situation and I avoided it." Do you have any comments on this?

SMITH: Well adding hydrogen to the makeup is a normal evolution, in other words, makeup tank pressure has to be within a certain, I don't remember the numbers off the top of my head, but you know, we got a bad operative and if the pressure was low you could add hydrogen to makeup tank which would change the reactor coolant system inventory.

MARTIN: Why would it change the reactor coolant system inventory, since that is a differential device of Bailey BR Differential Meter, there are two LT1, LT2, they are switch selectable, they feed recorders in the control room which Mr. Hartman says never moved. They also feed the computer in parallel. Why, why would just changing the pressure in the makeup tank effect RCS inventory?

SMITH: It presses the water, you know, it looks like it has less water in it, it could change the temperature.

MARTIN: What kind of pressure range are we talking about?

SMITH: I knew you were going to ask that. I think the band is 10-30 pounds, I mean you can't quote me on that. I don't remember.

MARTIN: Okay, but it is certainly less than a hundred pounds.

SMITH: The makeup tank pressure, yea, definitely.

MARTIN: Okay, given that it is that kind of pressure, is water that compressible?

SMITH: Sure, you are only looking for one gallon a minute. You can change anything you do to the primary system, to change the leak rate.

MARTIN: I won't pursue that. Let me go on into some of Mr. Hartman's statements.

KIRTPATRICK: Tim, I would like to comment. If you compress the water in the makeup tank, would that not appear to be an increased leak rate since you reduced the volume?

SMITH: I don't remember the equation, okay, the equation, they probably have it here, okay, you got to look at what the computer looks at, okay, you know, cause it looks at the makeup tank level, pressurizer level, you know, drain tank, temperature, you know, the T hots, T colds, I don't know the equation that well.

MARTIN: Let's go back into. Mr. Hartman has stated that that was one technique that was used, another technique that was used was to add demineralized water, starting the transfer pump and cracking the valve during the running of the test. Another technique that was used was when the RCDT levels were not hard-wired into the computer, apparently there was a requirement to provide the millivolt readings to the computer at the beginning and the end of the test and one of the ways to get a lower leak rate was to overstate the final millivolt value such that you had an indication of higher identified leakage than you really did. He indicates that he did all three at one time or another and that others did it. Were you aware of this?

SMITH: The only way he could have used that is if he was doing hand calculation, okay, cause the computer, the equations already in the computer, you don't have to feed the computer anything to 855 for a leak rate, you just, whatever that code is, you know, it does some calculation to make what he says, you would have to go through the hand calculation.

MARTIN: Okay, I have a copy of the RCS test here, in fact I have copy of the computer printout. There are one, two, three, four, five entries the operator must make. Some of them can be backed up by paper work.

SMITH: He don't make those.

MARTIN: He doesn't make this entry, this entry, that entry, that entry, that entry?

SMITH: (Unintelligible) Boy, it's been so long. Yea, I guess in Unit 2, okay, you do, we was using the digital, you have to, that's true.

MARTIN: Okay, so I have to agree with Mr. Hartman, It is a technique that could be done.

SMITH: That's right. he could

MARTIN: He states he has done it. I am asking you, were you aware that your operators were doing it.

SMITH: No, definitely not.

CHRISTOPHER: Bernie, do you know of any instances where any of the shift foremens or supervisors encouraged any of their personnel to take any actions such as described by Hartman in order to get acceptable readings.

MITH: No I don't.

MARTIN: Was Hartman under pressure to get good leak rates?

SMITH: Mr. Hartman always felt he was under pressure, all right, no matter what it was.

MARTIN: Was his job in jeopardy for not getting the good leak rates?

SMITH: No, that was my responsibility, you know, his job was not in jeopardy.

MARTIN: Do you have any other questions on that area?

KIRKPATRICK: What do you feel was the accuracy of the temperature distribution as measured by the the temperatures during normal operation?

SMITH: As I remember it's plus or minus 2 degrees.

KIRKPATRICK: Okay, so it would be possible to have a couple hundred degrees variation in the amount of water in the reactor just due to the inaccuracy in the temperature measurements.

SMITH: Yes, yea I believe that, yes sir.

KIRKPATRICK: Now the leak rate was measured over an hour period, right?

SMITH: That's true.

KIRKPATRICK: So a 6 degree deficit of water would give you one gallon per minute leak rate.

SMITH: Say that again now.

KIRKPATRICK: It would take a loss of 60 gallons of water over a period of one hour to give you one gallon per minute leak rate.

SMITH: That's true.

KIRKPATRICK: However, the temperature variation could easily give you 200 gallon loss just due to the inaccuracy measuring the temperature.

SMITH: This is true.

KIRKPATRICK: All right, thank you.

CHRISTOPHER: Let it be noted that the last four questions were asked by Mr. Kirkpatrick.

MARTIN: Okay I would like to move on to the next area which is related to the handling of safety concerns expressed by Mr. Hartman. I am going to give you a list here. Mr. Hartman states that he informed his supervision of problems with the primary system leak rate, problems with the conduct of procedures for emergency feedwater, failure to satisfy the approach to criticality requirements on the day that you weren't there, Brian Mehler was actually relieving you, repeated items of noncompliance of operators with procedures and this information was passed to his supervision orally and not in writing. Are you aware of any of these issues?

SMITH: Not at the present time, no. I would have to have more information than that,

MARTIN: If Mr. Hartman had brought to you a concern, how would you have handled it?

SMITH: Well, you know, just depends on what concerned, are you talking about procedures?

MARTIN: Let's say he brought you a concern that had safety substance to it, what would you do with it? Has he ever brought you such concern?

SMITH: Mr. Hartman brought me a lot of concerns. I would have to have some specifics, you know, I, my job is, you know, I would correct them or have them corrected, you know, it just depends on the circumstances, procedures, you know, I would make the proper paper work, the TCN, you know, things like that.

MARTIN: Do you remember an instance where Mr. Hartman brought you a safety concern and that you took some action on it.

SMITH: No I don't.

CHRISTOPHER: You mentioned that Hartman was always coming to you about something. By something, are you talking about everything from safety concerns, operations concerns, personal concerns that you are categorizing him, that he spends a lot of time with you it would seem. What context are you talking about?

SMITH: Everything.

CHRISTOPHER: Everything.

SMITH: Yes, you know, I just felt that, you know, Harold, you know, everything, especially towards the end, everything bothered him, you know, too many, I think really the job was too big for him, yet he was technically competent but under stress, you know, I don't think he performed very well.

CHRISTOPHER: Did he ever give you any indications that whether they were being asked to or not, they were fudging calculations and records to get the, to get acceptable readings on these various problems. Did you ever have any indication that he was not, you know, inputting accurate data into these various programs he has mentioned.

SMITH: No, because I don't think Hal Hartman would do that. In other words, what he is talking about, the numbers, like that, I don't think he would do that. I don't know anybody that would intentionally do it, but Harold I don't think would do it, you know, he just absolutely, if I told him to write down a number that wasn't right, I don't think he would, even though I wouldn't ask a man to do that, you know, we don't operate that way.

MARTIN: All right, another question. Apparently Mr. Hartman surfaced a large number of concerns. Was his job in jeopardy because of the number of concerns or because he was surfacing concerns.

SMITH: No. His job was in jeopardy probably because of his ability to work up there. Not because, you know, he complains, the guy's got a legitimate complaint, you know, that's not, you don't jeopardize your job that way.

CHRISTOPHER: Do you know of any indication where anyone indicated to him, this is prior to his actually leaving, that his job was in jeopardy because of his emotional stability in the control room. Was he aware that this was viewed as a problem from management standpoint?

SMITH: Yes, Mr. Hartman was aware of that.

CHRISTOPHER: How would you say that he was made aware of that.

SMITH: Because we, I had talked to him more than once about his attitude toward the job and things like that. Of course, there was a couple times that I think Brian Mehler was involved, that we actually had his relief brought in because he absolutely refused to do a job. That was part of his job, you know, just part of his job.

CHRISTOPHER: Can you cite us a couple of instances where you actually had to have relief brought in for him under circumstances you described.

SMITH: I only know about them, okay, I wasn't involved in that, okay.

CHRISTOPHER: Could you just give us an overview of what these involved.

SMITH: No, because you quote me on these, you know, I might not really know the full details of them.

CHRISTOPHER: Well let me specifically ask you about one and if you can quote on this. One of his, if you read the transcripts, there is a reference to the fact that he had better shut up or be fired. This is in the Rosen transcript of the TV program and that is stated by Mr. Rosen and not stated by this individual, Hartman. But he relates that incident to a specific occasion involving Brian Mehler. The background is that they, he was in the control room on a panel during startup, that they were having a prolonged problem with continuous nuisance alarms going off, that as a result of that, Hartman asked Brian Mahler to do something about the alarms because he couldn't concentrate and he was apparently dissatisfied with Brian Mehler's response to that and stated that to the best of my recollection, -- if you can't do anything about it, get me a relief. And continuing the response, according to

Hartman by Brian Mahler was -- that if you want a relief, you may as well get your lunch bucket and go home. Does this particular incident come to light in your

SMITH: I'll answer, that's true. And I think it was not going critical, I think we was going from 0 to 3% power, like I say, I don't want to be quoted on that,--

CHRISTOPHER: I understand.

SMITH: And like that's a pretty normal evolution, I mean it's no big thing, okay and of course, big power plants I forget we have 1400 alarms, whatever. We do get a lot of alarms and there was something like you really don't set in the control room all the time, okay, as far as shift supervisors, and I think the order was given and like two hours later when Brian came back, he hadn't done anything but moan and groan, I guess, and I think that is what it is all about. I think it was the increase from 0 to 3% power as I remember.

CHRISTOPHER: Did you get the indication that Brian did tell him or did indicate to him that he could be fired, I'm using my words now, not anyone else's, that indicates that he could be fired or that he should leave the plant if he wasn't going to do the job. Is that how Brian explained the incident to you or did he not go into that kind of detail.

SMITH: Well he didn't go into detail as far as being fired, you know, you normally don't use that term, but as far as being relieved on the job, yea I believe that. In fact I think they did relieve him.

CHRISTOPHER: Along this same line there was another incident during a plant startup. Again this is according to Mr. Hartman, when the reactor went critical below the estimated critical position and as he started, a shutdown which to him was according to procedure, Brian Mehler corrected his action and there was a dispute between them over that. Did Brian discuss that incident with you and whether that led to any type of warning or disciplinary action or anything like that.

SMITH: I read that statement, okay that he has made in his testimony, and I think he's confused, okay, in fact he admits it at the end of it as I recall. But I don't ever remember going critical on Group 5, TMI 2, not ever. And Brian Mehler you know, that's the first I heard it, when I read the testimony, okay, I just don't recall that incident at all.

CHRISTOPHER: You are not aware of any time when Brian Mehler corrected an action he was taking in regard to a plant startup in relation to the critical position.

SMITH: No.

CHRISTOPHER: Okay.

MARTIN: I have no further question. Mr. Kirkpatrick?

KIRKPATRICK: I don't have any more.

CHRISTOPHER: Bernie, we've covered, these various areas related to this man. Again none of us have any questions. Do you have any particular comments that you would like to bring up, we would open the floor to you and to John at this point about this incident or anything else that you want to discuss.

SMITH: Well probably one of the things that bothers me about the whole thing is, I don't know if this is applicable here or what, did the television interview set up by some reporter institute all this, as far as you guys going back through this deposition made to the NRC a year ago or whenever it was.

CHRISOPHER: The depositions made -- a year ago, originally.

MARTIN: The information that is available that was discussed by Mr. Rosen in his TV program largely comes out of the May 22, i.e. investigation transcript, subsequent deposition from a special inquiry group and a tape. Each document supports the other, there's a common thread

that goes through them. The early look at some of his concerns was to my knowledge initiated as a result of Mr. Rosen's inquiry to IE what was being done about the concerns raised by Mr. Hartman. It is my understanding that as NRC gets around to it, all the concerns and all the tapes will be looked at, but I don't know that for a fact.

SMITH: The TV interview brought this to light.

CHRISTOPHER: It would appear that many, there were many areas at some point, may or may not be looked into that were looked into today because they were not related to the initial accident and that I think the scope of the investigation was confined to the problems surrounding the accident and items such as these which weren't related to that were put on a holding pattern until they could be gotten to when this TV program obviously expedited to a certain degree.

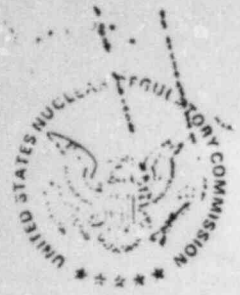
SMITH: It just seems funny to me, you know, you take an irate man, you know, he make a lot of statements to Rosen, I don't see how they justify that, that's all.

CHRISTOPHER: Okay, I don't have any further comments.

MARTIN: John, any comments you would like to make, any further Bernie.

SMITH: No.

MARTIN: Okay, at this time we'll conclude the tape of, again I remind you that I will get you a copy of the tape as soon as we can get it reproduced and get it back to you. We'll conclude, the time is 9:46.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

The purpose of this inquiry by the U.S. Nuclear Regulatory Commission is to investigate the concerns and allegations of a former control room operator from Three Mile Island, Unit #2, regarding safety and operational activities at this unit.

You are asked to provide information in as much detail as you can regarding these allegations and provide any recommendations you feel may be useful.

The U.S. Nuclear Regulatory Commission was given the responsibility and authority by the Congress of the United States in the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended, to licensee nuclear power plants and to see they are operated safely to protect the health and safety of the American Public. It is from this Act and Title 10, Code of Federal Regulations, that the U.S. Nuclear Regulatory Commission's Office of Inspection and Enforcement is conducting this official investigation.

You have the right to refuse to be interviewed. If you consent to an interview, you may have someone of your choice present. To assist in obtaining every comment, exactly as it is given, and to expedite the interview, your permission to tape record this interview is requested. You have the right to refuse to have the interview tape recorded. The U.S. Nuclear Regulatory Commssion investigators will prepare a written record of your statements and request you to sign it. You have the right to refuse to give a signed statement. In the absence of a tape recording or a signed statement, the U.S. Nuclear Regulatory Commission investigators will, to the best of their abilities, write your comments for inclusion in the investigative report. Upon your request you will be given a copy of your tape recording or signed statement.

You have the right to request that your identity be protected and not used in the U.S. Nuclear Regulatory Commission investigation report. However, because of the deep concern over this incident by the American public and government officials, the U.S. Nuclear Regulatory Commission cannot assure you that we will not release your name and interview contents if we receive official requests and requests by the public through the Freedom of Information Act. If specifically requested, all attempts will be made by the investigators to keep from disclosing to Metropolitan Edison or other parties specific information. You must recognize that this is not an absolute guarantee. Federal law prohibits your employer from discharging you or discriminating against you because of your interview with the U.S. Nuclear Regulatory Commission.

Your help and cooperation in providing information to the Nuclear Regulatory Commission will be appreciated.

Questions

1. Do you understand the above? yes [X] no [ ]
2. Do we have your permission to tape the interview? yes [X] no [ ]
3. Do you want a copy of the tape? yes [X] no [ ]

B Y Smith — SIGNATURE
3/27/80 — DATE
0904

WITNESS R K Christopher — SIGNATURE
3-27-80 — DATE
0904

INVESTIGATOR — TITLE

WITNESS [illegible] — SIGNATURE
3/27/80 — DATE
0904

Supv Chief — TITLE

R. Keith Christopher has identified himself to me as an investigator of the Nuclear Regulatory Commission, an agency of the United States, which is performing an investigation authorized by the Atomic Energy Act of 1954, as amended. I understand that any false statement made by me during this investigation may subject me to criminal prosecution under 18 USC 1001.

B Johnson 3/27/80 0904
(interviewee signature)

WITNESS RKChristopher 3/27/80
T Mark 3/27/80

18 USC 1001 Fraud and False Statements

1001. Statements or entries generally

Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or makes any false, fictitious or fraudulent statements or representations, or makes or uses any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

June 25, 1948, c. 645, 62 Stat. 749.

8561

A-11

CRO's

Z	D	Dennis Olson	11-7
*	D	Lynn Wright	3-11
	B	Ted Illjes	7-3
	E	R. Booher	susp.
*	F	E. Itemmila	11-7
	B	J. Kidwell	3-11
*	A	E. Frederick	train
	D	A. miller	"
*	A	C. Faust	3-11
*	C	J. Congdon	7-3
*	C	M Phillippe	7-3
	E	T. Blessing	11-7
	C	M. Cooper	7-3
*	D	M. Coleman	OFF
*	B	C Mell	7-3
*	F	~~L.P. Garner terminated in August, 79~~	LAST KNOWN P.O. Box 215 BATA MTNS
*	F.	McGovern	

Interviews @ trailer #5 555-1012

3/27

3/28 · 1-207-555-121

Z

LP Garner P.O. Box 15 Bath Maine 442-7687 scott 207-442-7282

3 p.m - Kidwell ✓

8 a.m. — Blessing Mon

9 a.m. — Cooper ✓

10 a.m. — Illjes ✓

Bangor

BCP. DOB APRIL 23, 1978

Ordered transcript 0158.

NOT SALT POWER MARGIN

CRO SCREENING

1. Prior to the accident ~ 3/28/79, were you ever under the impression that your management or supervision was not interested in and/or did not want to hear your safety concerns?
   N, N, N,
2. Have you ever raised a safety concern to management attention, which you felt was not adequately addressed by their corrective action?
   N, Y (management), N,
3. Had Hartman stated he fudged RCS dilution calculations because operators were under pressure to get "good boratest." Are you aware of anyone, including yourself, who ~~fudged~~ falsified boratests or other surveillance test calculations.
   N, N, N
   * Are you aware of any pressure to falsify words or not to report unsatisfactory surveillance results.. Not reported
4. Had Hartman stated he was directed to violate procedures by a shift supervisor in being ordered to continue the plant startup when the reactor went critical below an allowable band around the ECP. Are you aware of other instances where you or others were directed by plant management or supervision to violate

5 When an RCS Inventory surveillance test was run and it failed; what was done with the result; what was done with the plant? Are repeated failures within the surveillance interval allowed?

TW, TW, ~~[illegible]~~

RS, RS, RS

72- 72- 72

~~[illegible]~~ ~~[illegible]~~ all

CL CL #213

Seals

6.

CRIOs	HARTMEN	KROWER	CORBETT	ELLIOTT	WRIGHT	McGOWEN	FAUST	PALUMBO	COLEMAN	MEE	HERMAN	OLSON	FREDERICKS	BLESSING	GERMER	CONDON	MINORITY FINDINGS
SAFETY CONCERNS	Y	N	N	N	Y INCREASE SAFETY	N	N	N	N	N AS LONG AS NOT ARMED	N	N	N	N	N		N
CONCERNS WITH LOCKOUT	Y ECP EFWS LR	N	Y FAILURE DURING N OTHER	N	N	SOME TIMES N SLOW	Y FAILURE TO HOLD DURING TEST	Y FAILURE TO HOLD DURING TEST	Y FAILURE TO HOLD N	N	N	N	N	N	N		N
FAILURE TO PARTIAL	Y	-	-	-	N TIME TO LIMIT YES	N	N	N	N DON'T THINK IT HOLD ONE	N	N	N	N	N	N		N
FAILURE TO [illegible]	-	-	-	-	N DON'T HOLD IF ARM IN MIDDLE	N	N	N	N	-	N	N	N	N	N		N
[illegible]	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N		N
[illegible]	-	-	-	-	N	N	N	N	N	-	N	N	N	N	N		N
[illegible]	Y	N	N	N	N	N	Y ON SAFE SYS	N	N	N	N	N	N	N	N		N
[illegible]	TW	TW	TW	TW DON'T KNOW	TW MAY CAUSE SOP	TW	TW	TW	TW	TW	TW	TW	TW	TW	TW		TW LATER HERE
[illegible]	RS	RS	RS	RS	RS LOOK FOR ARM	RS VOTING BASE	RS	RS	RS I DID NOT KNOW IT	RS	RS	RS	RS	RS	RS		RS LOOK FOR ARM
[illegible]	72-1	72-1	72-1	72-1	72-1	72-1	72-1	72-1	BASIC QUESTION 72-1	72-1	72-1	72-1	72-1	72-1	72-1		72-1 TRAIN MORE INTENSE
[illegible]	-	N	3 Y	3+2 N	3+2	3+2	3+2	3	2+3	2+3	-	3	2	2	-		2

CRO's

2 D ~~Dennis Olson~~ ~~Hwy~~

D. OLSON ✓

*D ~~Lynn Wright~~ 3-11 —

A. MILLER ✓

B ~~Pete Illjes~~ 7-3

J. GONGDON - WBD

E R. Booher Susp.

*F ~~E Hamil~~ 11-7

B ~~J. Kidwell~~ 3-11 ✓

*A ~~E Fawcett~~ Hwy

3 D ~~A miller~~ "

*A ~~C Faust~~ 3-11 —

1 *C J. Congdon 7-3 GONGDON WBD.

*C ~~M Phillippe~~ 7-3

E ~~F. Blessing~~ ~~Hwy~~

C ~~M Cooper~~ 7-3

*D ~~M Coleman~~ OFF

*B ~~C Bell~~ 7-3

*F ~~L. Grover~~ ~~D. Kimes~~ ~~terminated in project~~ 79. LAST KNOWN P.O. BOX 215 BATA MINING

✓*F. ~~McConnell~~

Interviews @ trailer #5

3/27

3/28 · 1-207-555-1212

E

~~Gilbert~~

E.P. Gerner P.O. 215 Bath, Maine 442-7687

3 p.m - Kidwell ✓

8 a.m. — Blessing Mon 1000

9 a.m. — Cooper ✓

10 a.m. — Illjes ✓

S-CTI 207-442-7282 - FBS operator 833-3131 FBS TMI 590-3095 Bangor

BCP. DOR APRIL 23, 1975

Cutting Time was 0158.

LAST SHUT DOWN MARKER

3-31-80

[redacted], GERMER, L. B. BOARD P., [redacted] ALT CRO. now employed at Maine Yankee

(1) nuclear safety concerns - no

(2) nuclear concerns re no (LOUSHERS)

(3) FLOCKING RCS CIRCULATIONS - no keep running leak rates until get a good a good one Germer - has no knowledge of leak rates actually being falsified

(4) pressure to falsify - no, Wolstep

(5) he was not to report things that should have been reported - no.

(6) anyone who falsified leak rates and test calculations - no not. ISI was constantly changing reference values to get passing rate.

(7) 77 - he was told 2 to get a ~~good~~ good one.

8 BCP CRITICALITY INCIDENT - heard nothing about it.

CRO SCREENING INTERVIEWS.

RKC

0903 3-28-80

(1) MARTIN COOPER - shift foreman

safety concerns - no - no to all questions by T.M. - response to Isolation problem

10:00

(2) ~~Ted~~ TBD ~~WAS~~ ILLJB - SHIFT FOREMAN
John Wilson - present at interview

(3) LYNN WRIGHT - CRO - nuclear safety items - no - if nuclear safety issue make it 4:30

(4) HUGH MCGOVERN CRO AT TMI - NOW A SHIFT FOREMAN 5:00 PM

(5) CRAIG FAUST 5:30 PM.

(6) MARK PHILLIPPS CRO. 5:45 PM
- only had resigned the day before the interview, had no reason to hold back -

need to confirm this

3-31-80 - JOHN WILSON - HIS RESIGNATION WAS TURNED

11:15. AM.

3-29-80

MARK & COLBRAN / CRO / 939-7550

1. N.

2 nuclear concern not adequately addressed timeliness, a problem, but doesn't appear relates to Procedural Problems

3 forced to Dodge leak rates falsify records

4 Pressure to falsify records - no. wanted them to get accurate records.

Reason not to report LCO failure - NO

CHG FALSIFIED LEAK RATES - NO

5 did add hydrogen to the makeup tanks, to get leakrates down + know of anyone who added water to makeup tank

felt a pressure to keep plant on the line.

CHARLES TROLL CRO - received license in June - received

John Nelson - Mell - left CRO July 1979

CRO SCREENING

3-31-80

~~EARL~~

EARL D. HEMMILA, SHIFT FOREMAN

1. no to responsible.
2. safety concern - no
3. pressure to falsify records - no
4. pressure not to report - no
5. falsify leak rate - no
6. not reporting ESFs - no
7. IBLP - NO
8. RCS INVENTORY - SURVEILLANCE - Thought very bad one and Perch another

10:45 AM

ADAM MILLER - SHIFT FOREMAN AT TIME OF VISIT. CURRENTLY ASSIGNED TO TRAINING.

no unusual answers. on 5 question hydrogen added to makeup tank - unknown but probably is done water to tank - without including in computer - doesn't know of this happening by anyone without telling the computer

on leakrate - feels manipulated was due but no specifics or instances

1130 3-31-80

OLSON, DENNIS - CRO

1 NO. - safety concerns

NO - adversary of incidences

2 NO PRESSURIZER TUBE GOOD

" LEAK RATES, OR NOT TO

" REPORT - ANYONE WHO

" FALSIFIED

3 " ESP CRITICALITY

EDWARD FROEHLICH - CRO NOW IN TRAINING

4 NO

2 NO

3 NO Pressure calibrate never

NO P' not to report

" Falsify leak rates

anyone

4 " (4) suspected of may have been happening

5 NO NOT reporting incidents

6 " CRITICALITY BUILT

3-31-80

JOHN J. BLOSSING CRO - received between Friday 3-28-80

1 ... no complaints on nuclear safety items, some secondary systems
2 NO - safety concerns
3 NO ... fudging leak rates other test calculations
4 NO ... Pressure to falsify records
5 NO ... Pressure not to report things
6 NO ... instance of not reporting problems
7 NO ... ECO circulating inside
8 NO ... violations of nuclear safety procedures
9 known any ... RCS Boronity Further

ways to Fudge leak rate
- add hydrogen to leak rate ~~test~~ after it has been done. . has feeling that hydrogen could be read upright
water to makeup tank - doesn't know

I assisted in interviewing three TMI Unit 2 Control Room Operators (CRO's), Hugh McGovern, Earl Hemmila and Mark Coleman, on April 10, 1980, at the NRC trailers at the site. Also participating in the interview was David H. Gamble of the Office of Inspector and Auditor. As part of the interview, I asked each of the operators a series of questions. The substance of these questions and the operator's answers derived from my memory and sparse notes, are briefly listed in the two attached sheets. Each operator was asked to sign a written statement which Mr. McGovern and Mr. Hemmila did. Mr. Coleman participated in the formulation and editing of a statement, but decided not to sign it. Where the answer to a question appears in the statement it is not included.

Donald C Kirkpatrick

Donald C. Kirkpatrick

Operator - Hugh McGovern

Q What is your understanding of the purpose of the leak rate test?

A To prevent the release or minimize the release of radiation to the environment. To determine leaks from the reactor to adjoining systems. To prevent loss of coolant from the reactor coolant inventory.

Q Have you ever received training on the connection between the unidentified leak rate and a crack in the reactor pressure boundary as discussed in the SAR?

A No.

Q Describe the leak rate test including all of the elements that go into the calculation of the leak rate.

A Gave a knowledgeable discussion of the test including the changes in the RCS density, pressurizer level, makeup tank and RC drain tank. Discussed the addition of water during the test and necessity for entering this in the computer.

Q Did you ever have difficulty getting good leak rate test results, and what were the main reasons for the difficulty?

A Yes and No. The main cause of inaccuracy was the variation in the indicated level in the makeup tank (false level change). This amounted to a inch or so which would cause a variation of about 30 gallons.

Q Were you aware of problems with the leak rate test computer program and the inaccuracies in the program?

A Yes. Did know that there was a change in the computer program between December, 1978 and January, 1979.

Q What was normally done with a computer test record that gave unacceptable results?

A It was discussed.

Q In what ways can the leak rate test results be changed by operator actions?

A See statement.

Q Did you ever use any of these methods to effect the results of a leak rate test?

A See statement.

(Subsequently Mr. McGovern was shown documentation showing that water had been added during the performance of one of his tests without entry into the computer. This is discussed in the statement.)

Q Did you know of any one else who used these methods to effect the leak rate test results?

A See statement.

Q Did any of your superiors ever tell you to do anything to change the results of a leak rate test?

A See statement.

U. S. NUCLEAR REGULATORY COMMISSION

TRANSCRIPT OF STATEMENT

DATE: April 10, 1980

TIME: 8:25 A.M.

I Hugh McGovern do hereby make the following free and voluntary statement to Mr. David H. Gamble, who has identified himself to me as an Investigator for the U. S. Nuclear Regulatory Commission. I understand this statement is being made in connection with an official NRC Investigation and may, if necessary, be used in judicial or administrative action. I make this statement with no threats having been made against me or promises extended to me.

In my capacity as a Control Room Operator at Unit 2 of the Three Mile Island Nuclear Station, I performed a number of leak rate tests from late November 1978 through March 1979.

I knew that addition of water during a test, without accurately reflecting this addition on the computer, would result in an erroneous test. I have never knowingly added water during a test without recording the addition on the computer. I have never knowingly added hydrogen or taken any other action which would cause the leak rate to appear acceptable, when, in fact, it may not have been.

I have reviewed the attached documents concerning a December 24, 1978, leak rate test. The signature of mine on the form indicates that I performed the

test; however, I do not recall this particular test. It has been pointed out to me that the log, signed by Craig Faust, indicates 200 gallons of water were added at 1830 hours; but the computer printout indicates no water was added. I cannot explain this discrepancy. I can say that, if this error did occur as the attachments indicate, there was absolutely no intent on my part to enter data that would cause the computer to indicate the leak rate test was favorable.

I would suggest that this may have occurred through a communication problem between Faust and me. This could have occurred by my asking Faust whether any water was added and Faust having given me zero as the answer. It also could have occurred if Faust misunderstood when I said the leak rate test would be completed. The latter explanation seems logical since the water appears to have been added about seven minutes before completion of the test.

Although there was pressure upon control room operators to get good leak rate tests, no one ever said or implied that we should perform any actions that might result in erroneous test results. I know of no one else performing any actions that would result in erroneous test results.

Test results that were unacceptable were discarded. I turned the results of unacceptable tests in to my shift foreman. The shift foreman discarded the results some of the time; other times I just communicated the information to him and I discarded the results. My shift foreman was usually Fred Scheimann; however other individuals also substituted for him from time-to-time. I was

never informed of a requirement, if any, to retain these records.

I have read the above statement, consisting of four pages and find it true and complete to the best of my knowledge and belief.

/s/ Hugh McGovern

Attachment: 5 pages

Subscribed and sworn to before me this

10th day of April 1980.

/s/ David H. Gamble

U.S. NUCLEAR REGULATORY COMMISSION

DATE April 10, 1980
TIME 8:25 A.M.

I Hugh M° Goverv do hereby make the following free and voluntary statement to Mr. David H. Gamble, who has identified himself to me as an Investigator for the U. S. Nuclear Regulatory Commission. I understand this statement is being made in connection with an official NRC Investigation and may, if necessary, be used in judicial or administrative action. I make this statement with no threats having been made against me or promises extended to me.

In my capacity as a Contrl Room Operator at Unit 2 f Th Three Mile Island Nuclear Station, I performd a number f leak rate tests from late November 1978 through March 1979.

I knew that addition of water during a test, without accurately reflecting this addition on the computer, would result in an erroneous test. I have never knowingly added water during a test without recording the addition on Th computer. I have

never knowingly added hydrogen or taken any other action which would cause the ~~H.m~~ leak rate ~~H.m~~ ~~H.m~~ to appear acceptable, when, in fact, it ~~H.m~~ may not have been.

I have reviewed the attached documents concerning a December 24, 1978, leak rate test. The signature of mine on the form indicates that I performed the test; however, I do not recall this particular test. It has been pointed out to me that the log, signed by Craig Faust, indicates 200 gallons of water were added at 1830 hours; but the computer printout indicates no water was added. I cannot explain this discrepancy. I can say that if this error did occur as the attachments indicate, there was absolutely no intent on my part to enter data that would cause the computer to indicate the leak rate test was favorable.

I would suggest that this may have occurred through a communication problem between Faust and me.

This could have occurred by my asking Faust whether any water was added and Faust having given me zero as the answer. It also could have occurred if Faust misunderstood when I said the leak rate test would be completed. The latter explanation seems logical since the water appears to have been added about seven minutes before completion of the test.

Although there was pressure upon control room operators to get good leak rate tests no one ever said or implied that we should perform any actions that might result in erroneous test results. I know of no one else performing any actions that would result in erroneous test results.

Test results that were unacceptable were ~~discarded~~ discarded. ~~I~~ I turned the results of unacceptable tests in to my shift foreman. The shift foreman ~~discarded~~ discarded the results some of the time; other times I

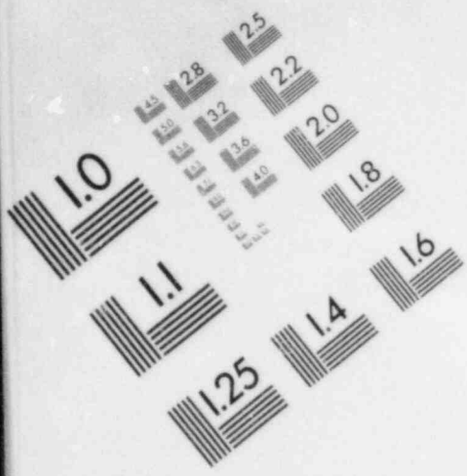
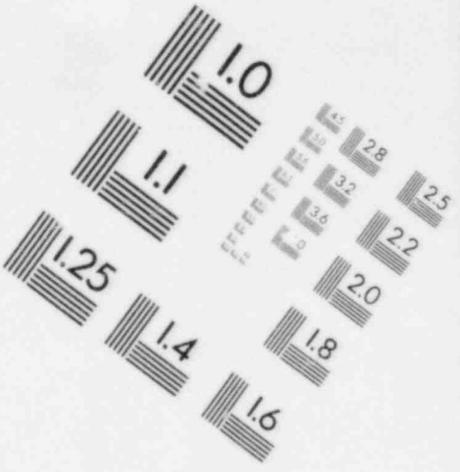
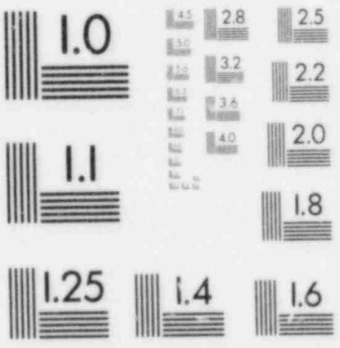
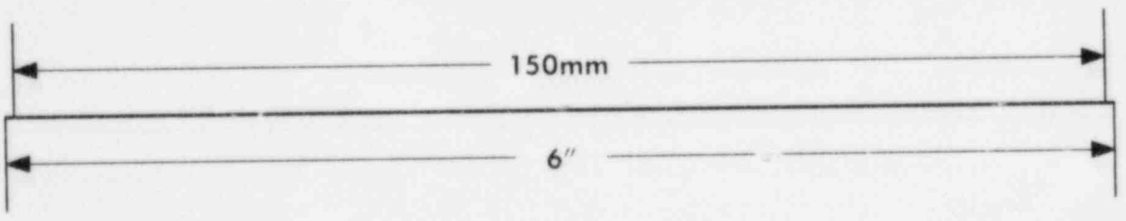
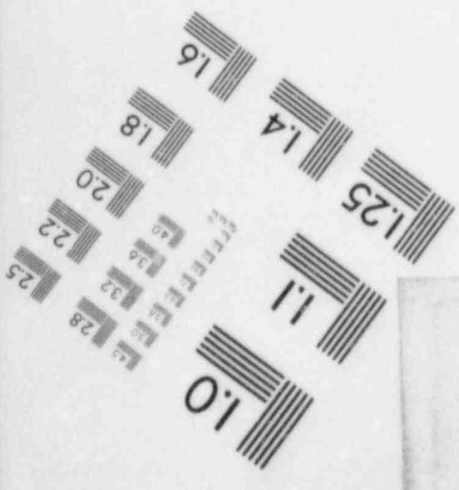


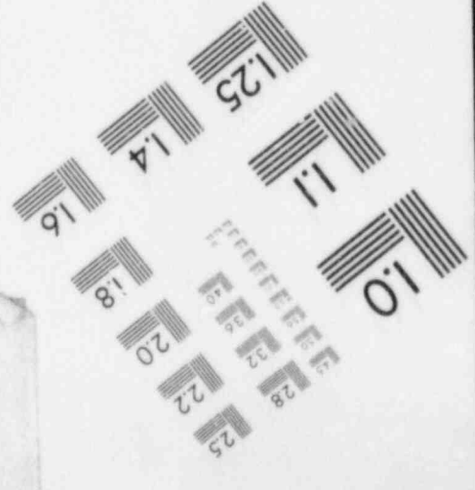
iMAGE EVALUATION TEST TARGET (MT-3)











just communicated the information to him and I discarded ~~deposited~~ the results. My shift foreman was usually Fred Scheimann; however, other individuals also substituted for him from time-to-time. I was never informed of a requirement, if any, to retain these records.

I have read the above statement, consisting of four pages, and find it true and complete to the best of my knowledge and belief.

Hugh M. Govan

Attachments: 5 pages

Subscribed and sworn to before me this 10th day of April 1980.

David H. Gall

(3)

rcs1

DATE: 12/24/78 — REACTOR COOLANT LEAKAGE TEST
TIME: 17:36:36 SP 2301-3D1

NOTE: IF OPERATOR ACTION DECREASES RCS VOLUME THE DATA ENTRY FOR THAT AC
...YOU MUST ENTER DEC. PT. WITH LEAKAGE VALUES...*

DESIRED INTERVAL (1-8 HOURS)
1
ENTER OPERATOR CAUSED CHANGES TO THE RCDT FROM DS 4 (2301-3D1)
0
ENTER OPERATOR CAUSED CHANGES FROM DS 4 (2301-3D1)
0
ENTER IDENTIFIED LEAKAGE FROM DS 3 (2301-3D1) (GPM)
0
ENTER PRIMARY TO SECONDARY OTSG TUBE LEAK (GPM)
0

TIME	TCA (F)	THA (F)	TCB (F)	THB (F)	TAVE (F)	PRZR LVL (IN)	MUTK LVL (IN)
17:36:59:	557.070	606.305	558.117	606.038	582.102	298.703	73.695
18:36:59:	557.141	605.711	558.148	606.336	581.828	298.469	72.670

GROSS LEAK RATE (<30 GPM): 0.3877 GPM

TOTAL IDENTIFIED RCS LEAK RATE (<10 GPM): 0.2055 GPM

NET UNIDENTIFIED LEAK RATE (<1 GPM): 0.1822 GPM

OPERATOR: Hugh M° Lam ←

APPROVED: C. Guthrie ←

WATER ADDITION

12/24 78

0000 Continued the shift. Rx at 90% pwr, RCS boron 1109 ppm
GP 1-5 at 100%, GP 6-7 at 90% GP 8 24%
NP-R-227 005, 3 cond pumps, 2 condensate, 2 FPs on
Hugh McGowan

0040 STARTED NK-P-1A AND NK-P-1C, STOPPED
NK-P-1B AND NK-P-1D

0044 PLACED "A" LPS in MANUAL BYPASS

0045 STOPPED CO-P-1C

0049 OUT OF MANUAL BYPASS CH "A", in BYPASS CH "B"

0055 OUT OF MANUAL BYPASS CH "B"

0135 ADDED 300 gal DEMIN H_2O TO MU-T-1

0155 OPENED CV-4

0220 ADDED 300 gal TO MU-T-1 DEMIN H_2O — ?? MUT level doesn't show it

0245 ADDED 300 gal TO MU-T-1 DEMIN H_2O

0305 Rx pwr at 95%
Hugh McGowan

0315 Relieved the shift Conditions as noted

0540 Add 300 gal to MU-T-1 Demin H_2O

0545 Raised pwr to 96.5% F (947 MWE pt 182)

0715 Test H_2/core monitor for Generator

0840 Added 280 gals of DI water to MU-T-1

0843 Placed A RPS in Bypass to check Pwr Flux/imb Trip
set points - 101.6 0 imb

0855 A RPS Returned to normal

0856 Placed B RPS to man Bypass P/F/imb
Trip set point check

0900 B RPS Returned to normal

0905 Placed C RPS To man Bypass for P/F/imb by
Trip set point check

0910 C RPS Returned to normal

0911 Placed D RPS to man Bypass For P/F/imb
Trip set point check

0912 D RPS Returned to normal

0913 Raised H_2 pressure to 75# in Generator

1100 Relieved the SHIFT, Conditions as before

1210 Added 200 gallons of demin water to MU-T-1

1225 Added 125 gallons of demin water to MU-T-1 — TIME REPORTS OFF

317 Commenced TP 800/22

1345 Red tagged Shut As-V-23

1437 Added 200 Gallons to MU-T-1 From A RCBT

1450 Added 200 Gallons to MU-T-1 From A RCBT

1455 Completed TP 800/22

Carl D Flemmke

1500 Relieved The Shift, Condition as before. Plant

1830 Added 200 gals of Demin Water To MUT.

1900 Added 200 gals of Demin Water To MUT.

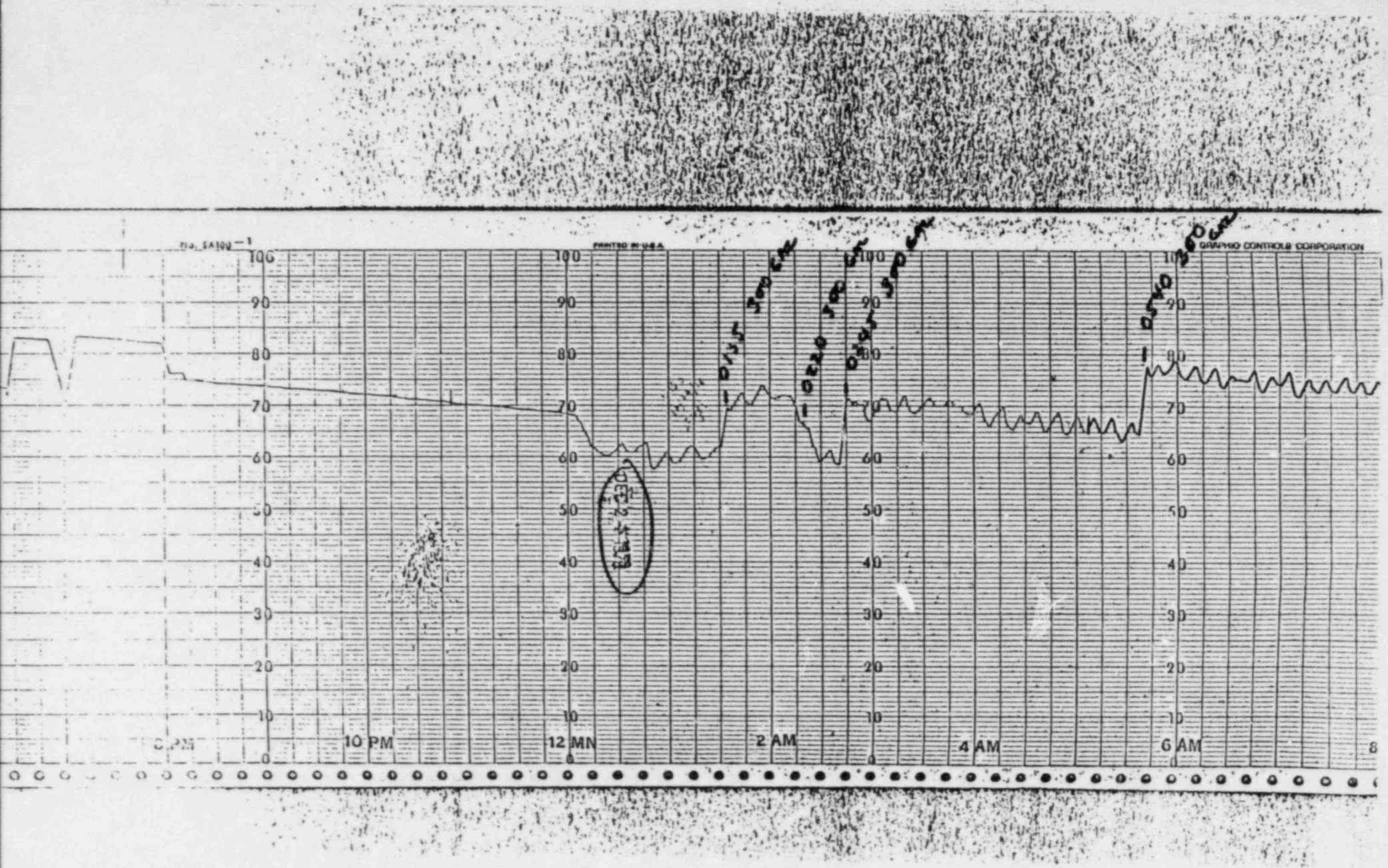
1520 Dumping ACOT C.

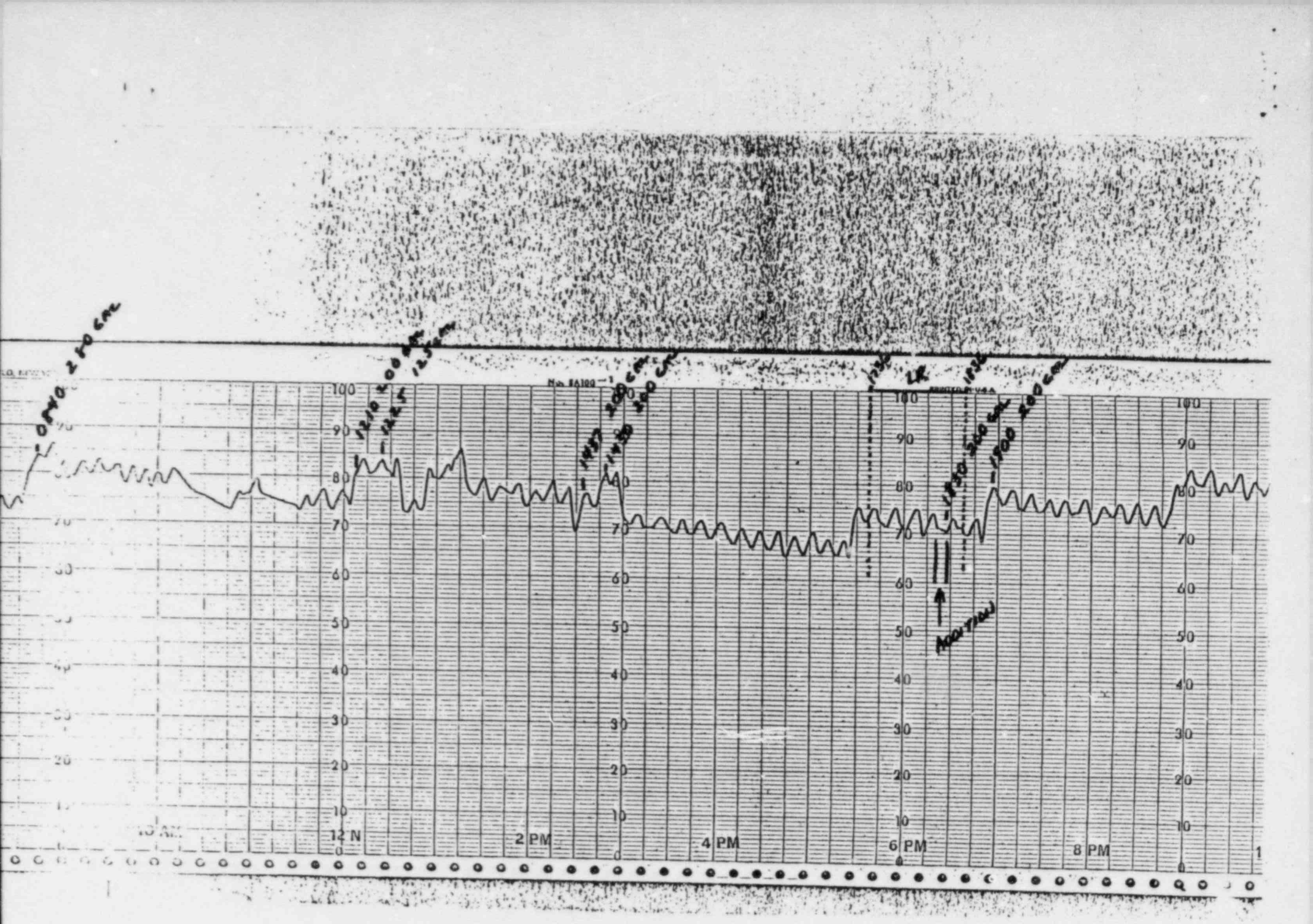
2200 Raised Storage (Cond.) TK Lvls To 20' From 14'.

2201 Lined up vacuum Degassifier To 50K.

2230 Completed Leak check on RB Door (Passed)

Gary C Faust


GRAPHIC CONTROLS CORPORATION
100
90
80
70
60
50
40
30
20
10
0
10 PM
12 MN
2 AM
4 AM
6 AM


12 N
2 PM
4 PM
6 PM
8 PM

I assisted in interviewing three TMI Unit 2 Control Room Operators (CRO's), Hugh McGovern, Earl Hemmila and Mark Coleman, on April 10, 1980, at the NRC trailers at the site. Also participating in the interview was David H. Gamble of the Office of Inspector and Auditor. As part of the interview, I asked each of the operators a series of questions. The substance of these questions and the operator's answers derived from my memory and sparse notes, are briefly listed in the two attached sheets. Each operator was asked to sign a written statement which Mr. McGovern and Mr. Hemmila did. Mr. Coleman participated in the formulation and editing of a statement, but decided not to sign it. Where the answer to a question appears in the statement it is not included.

Donald C Kirkpatrick

Donald C. Kirkpatrick

Operator Earl Hemmila

Q What is your understanding of the purpose of the leak rate test?

A To prevent the release or minimize the release of radiation to the environment. Also, if the leak rate is high it could get bigger.

Q Have you ever received training on the connection between the unidentified leak rate and a crack in the reactor pressure boundary as discussed in the SAR?

A No.

Q Describe the leak rate test including all of the elements that go into the calculation of the leak rate.

A Gave a knowledgeable discussion of the test including the changes in the RCS density, pressurizer level, makeup tank and RC drain tank. Discussed the addition of water during the test and necessity for entering this in the computer.

Q Did you ever have difficulty getting good leak rate test results, and what were the main reasons for the difficulty?

A Yes. Didn't know why, but said that a lot of things could happen, for instance, temperature changes.

Q Were you aware of problems with the leak rate test computer program and the inaccuracies in the program?

A Yes.

Q What was normally done with a computer test record that gave unacceptable results?

A See statement.

Q In what ways can the leak rate test results be changed by operator actions?

A See statement.

Q Did you ever use any of these methods to effect the results of a leak rate test?

A See statement.

(Subsequently Mr. Hemmila was presented with records showing that hydrogen had been added during the performance of one of his leak rate tests. This is also discussed in the statement and copies of the material are attached to the statement.

Q Did you know of any one else who used these methods to effect the leak rate test results?

A See statement.

Q Did any of your superiors ever tell you to do anything to change the results of a leak rate test?

A See statement.

U. S. NUCLEAR REGULATORY COMMISSION

TRANSCRIPT OF STATEMENT

DATE: April 10, 1980

TIME: 10:00 A.M.

I Earl D. Hemmila do hereby make the following free and voluntary statement to Mr. David H. Gamble, who has identified himself to me as an Investigator for the U. S. Nuclear Regulatory Commission. I understand this statement is being made in connection with an official NRC Investigation and may, if necessary, be used in judicial or administrative action. I make this statement with no threats having been made against me or promises extended to me.

In my capacity as a control room operator at Unit #2 of the Three Mile Island Nuclear Station, I performed leak rate tests from approximately June 1978 through March 1979.

During any leak rate test I performed, if water had to be added, the tests were generally discarded. These tests were discarded by me after mentioning it to Hugh McGovern, because of the possibility of the water adversely affecting the test result.

In this type of situation, we typically did not enter the amount of water added to the computer since we would have already decided to scrap the test and discard the results. A new test would then be initiated when the plant was in a stable condition.

Until informed recently by NRC officials, I was not aware that the addition of hydrogen during a leak rate test could affect the results of the test. It was entirely possible that I did add hydrogen during a test (as indicated on the attached documents concerning a March 21, 1979 test). Hydrogen levels were checked each morning by Unit 2 superintendent Logan, so control room operators were sensitive to maintaining the required hydrogen levels. Any hydrogen I may have added certainly was not an attempt to obtain good test results.

I know of no other individuals who added water or hydrogen or performed any other activities in order to obtain a good leak rate test result when it would not otherwise have been good.

I never felt pressured to get good leak rate test results by anyone. The reaction of my supervisors when I informed them of an unacceptable leak rate test result (either one that was scrapped because we had to add water or a test that just did not pass) was merely to perform another test. Since there was no requirement to retain unacceptable test results, such results were merely discarded.

Although I was aware that there were some difficulties with the computer program, until informed today by NRC officials, I was not aware that the program reflected water being added to the system at about 5 pounds per gallon, when the water was actually at about 8 pounds per gallon.

I have read the above statement, consisting of four pages, and find it true and complete to the best of my knowledge and belief.

/s/ Earl D. Hemmila

Attachments: 10 pages

Subscribed and sworn to before me this
10th day of April 1980.

/s/ David H. Gamble

U.S. NUCLEAR REGULATORY COMMISSION

DATE April 10, 1980
TIME 10:00 A.M.

I EARL D. Hemmila do hereby make the following free and voluntary statement to Mr. David H. Gamble, who has identified himself to me as an Investigator for the U. S. Nuclear Regulatory Commission. I understand this statement is being made in connection with an official NRC Investigation and may, if necessary, be used in judicial or administrative action. I make this statement with no threats having been made against me or promises extended to me.

In my capacity as a control room operator at Unit #2 of the Three Mile Island Nuclear Station, I performed leak rate tests from approximately June 1978 through March 1979.

During any leak rate test I performed, if water had to be added, the tests were ~~most~~ generally discarded. These tests were discarded by me after mentioning it to Hugh McGovern, because of the possibility of the water adversely affecting the test result.

In this type of situation, we typically did not enter the amount of water added to the computer since we would have already decided to scrap the test and discard the results. A new test would then be initiated when the plant was in a stable condition. Until informed recently by NRC officials, I was not aware that [redacted] the addition of hydrogen during a leak rate test could affect the results of the test. It was entirely possible that I did add hydrogen during a test (as [redacted] indicated on the attached documents concerning a March 21, 1979 test). Hydrogen levels were checked each morning by Unit 2 superintendent Logan, so control room operators were sensitive to maintaining the required hydrogen levels. Any hydrogen I may have added certainly was not an attempt to obtain good test results.

I know of no other individuals who added water or hydrogen or performed any other activities in order to obtain a good leak rate test result when

D...o, f 4 504

it would not otherwise have been good.

I never felt pressured to get good leak rate test results by anyone. The reaction of my supervisors when I informed them of an unacceptable leak rate test result (either one that was scrapped because we had to add water or a test that just did not pass) was merely to perform another test. Since there was no requirement to retain unacceptable test results, such results were merely discarded.

Although I was aware that there were some difficulties with the computer program, until informed today by NRC officials, I was not aware that the program reflected water being added to the system at about 5 pounds per gallon, when the water was actually at about 8 pounds per gallon.

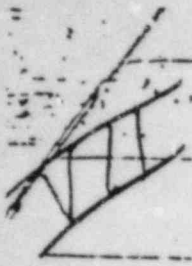
I have read the above statement, consisting of four pages, and find it true and complete to the best of my knowledge and belief.

Earl D. Hennis

Attachments: 10 pages

Subscribed and sworn to before me this 10th day of April 1980.

Dan P. Hall



calculated H_2

rcs1

DATE: 3/21/79
TIME: 1:14:33

REACTOR COOLANT LEAKAGE TEST
SP 2301-3D1

NOTE: IF OPERATOR ACTION DECREASES RCS VOLUME THE DATA ENTRY FOR THAT ACTION MUSTBE NEGAT
...YOU MUST ENTER DEC. PT. WITH LEAKAGE VALUE ...

DESIRED INTERVAL (1-9 HOURS)
1

ENTER OPERATOR CHOSEN CHANGE TO THE RCDT FROM DG 4 (2301-3D1)
0

ENTER OPERATOR CHOSEN CHANGES FROM DG 4 (2301-3D1)
207.

ENTER IDENTIFIED LEAKAGE FROM DG 3 (2301-3D1) (GPM)
2

ENTER PRIMARY TO SECONDARY TOTAL TUBE LEAK (GPM)
0

TIME	TCA (F)	THA (F)	TCB (F)	THB (F)	TAVE (F)	PRZR LVL (IN)	RCDT LVL (IN)	RCDT LVL (INCHES)
1:14:56:	556.036	605.700	557.041	605.727	581.402	225.301	75.736	76.005
2:14:56:	556.041	605.555	557.430	605.516	581.201	225.108	71.462	79.448

GROSS LEAK RATE (<30 GPM): 6.0513 GPM

TOTAL IDENTIFIED RCS LEAK RATE (<1 GPM): 4.1033 GPM

NET UNIDENTIFIED LEAK RATE (<1 GPM): 1.8980 GPM

OPERATOR: Earl D. Hemmila E.D. HEMMILA
APPROVED: C L Guthrie C.L. GUTHRIE

Corrected — .22 GPM

EOH

March 20, 1979

1030 De-activated Cable Room Halon System - set fire watch
1048 HP-R-215 back in service
1105 Added 250 Gal DW to MU-T-1
1135 Tested DF-X-1A, started in 9.0 sec, added 300 Gal from ABlead [to MU-T-1
1145 Added H2 to T-G to 76 psig
1213 [illegible] and Tagged out DF-X-1B for Maintenance - added 250 gal to
1213 Relieved the night.
1220 added 300 gal DW to Res.
1230 H2.
1730 Assumed shift duties as before [illegible]
1301 Increased Generator MVARS to 200 in - they lost several big units on down the pike and they want us to help out
1313 Opened Aux Bldg Shield door
1315 Cable room halon syst back to normal
1330 Aux Bldg Shield door closed added 250 Gal DW to MU-T-1
1340 Stopped Z-2 fan on MDCT
1425 Backwashed 3CCCW Coolers
1438 Added 400 Gal DW to MU-T-1
[illegible]
1500 Relieved the shift [illegible] Frederick, Rx power = 98%, 2155#, 582°F, GP 6/7 @ 96%, GP 8 @ 27%, 912 MWe, 2724 MWt
1545 ADDED 252 gal DW TO MU-T-1
1622 ADDED 100 gal DW TO MU-T-1
1623 ADDED 400 gal from RCDT-A to MU-T-1
1800 tested SB-LCCW HEADERS - SAT.
1805 ADDED 400 gal from RCDT-A TO MU-T-1
1735 STARTED RELEASE OF SEC WASTE TANK.
1815 STARTED MDCT FANS A/B IN FAST
1855 ADDED 100 Gal DW TO MU-T-1
1900 ADDED 300 GAL FROM RCDT A TO MUT 1
2014 added 252 gal from [illegible] DW TO MUT-1
2138 ADDED 252 gal from RCDT-A
2345 TERMINATED SEC WASTE TANK RELEASE.
2210 ADDED 252 gal from RCDT A
2238 Conducted test of DF-X-1B (Train B) SAT.
2252 ADDED 252 gal DW to MU-T-1

3/21/79

2300 Assumed the shift 98% Power RCS Boron 1035 Boron Sta 5 100%. Delta 77%. Xe & 277%. Sending Aux Steam to Unit I. & receiving condensate in return. Burst Tube Leak Det. Pri to spray & 2 BK of Ht in normal Heaters.

2305 Added 400 gal Dem H_2O.

0020 Added 200 gal from RCBT "A"

0027 Adj Vars to 170.

0100 Added 400 gal Dem H_2O.

0115 Started 2322-R3. Placed HPR-219 in defeat.

0126 Added 200 gal Dem H_2O

0205 Added H_2 to VCT.

0256 Added 100 gal H_2O from RCBT "A"

0329 Added 200 gal H_2O from RCBT A

2405 Added 200 gal Dem H_2O

L.E. 0332 Started to add H_2 to turbine Gen.

0415 Secured adding H_2 To turbine Gen.

0417 added 100 gal Dem H_2O.

0455 Added 200 gal Dem H_2O.

0557 Started A Diesel Gen to test operation prior to tagging B Diesel out. Tested Sat. In ES Standby.

0602 B Diesel Gen tagged out.

0605 Added 200 Gal from RCBT A. & 50 Gal Dem H_2O. Heaters

7-3 Joseph R Colyer ←

0645 Relieved the shift, Conditions as Before.

0735 Heat Bal Cal 2302-31. Sat.

L.E. 0715 Added 250 gal from RCBT "A" To VCT-T-1

0802 Added 260 gal of DI H_2O to VCT-T-1

0826 Connected 2303-146 on Ch "B" RPS Cab.

0846 Placed "B" RPS Cab in Mtn. Bypass 2303-146

0850 Added 250 gal DI H_2O to VCT-T-1

0900 Conducted Retest of 2302-1435 and 2C M/S Iso DC-V103 E, Sat.

0950 Added 260 gal Batch to RCS.

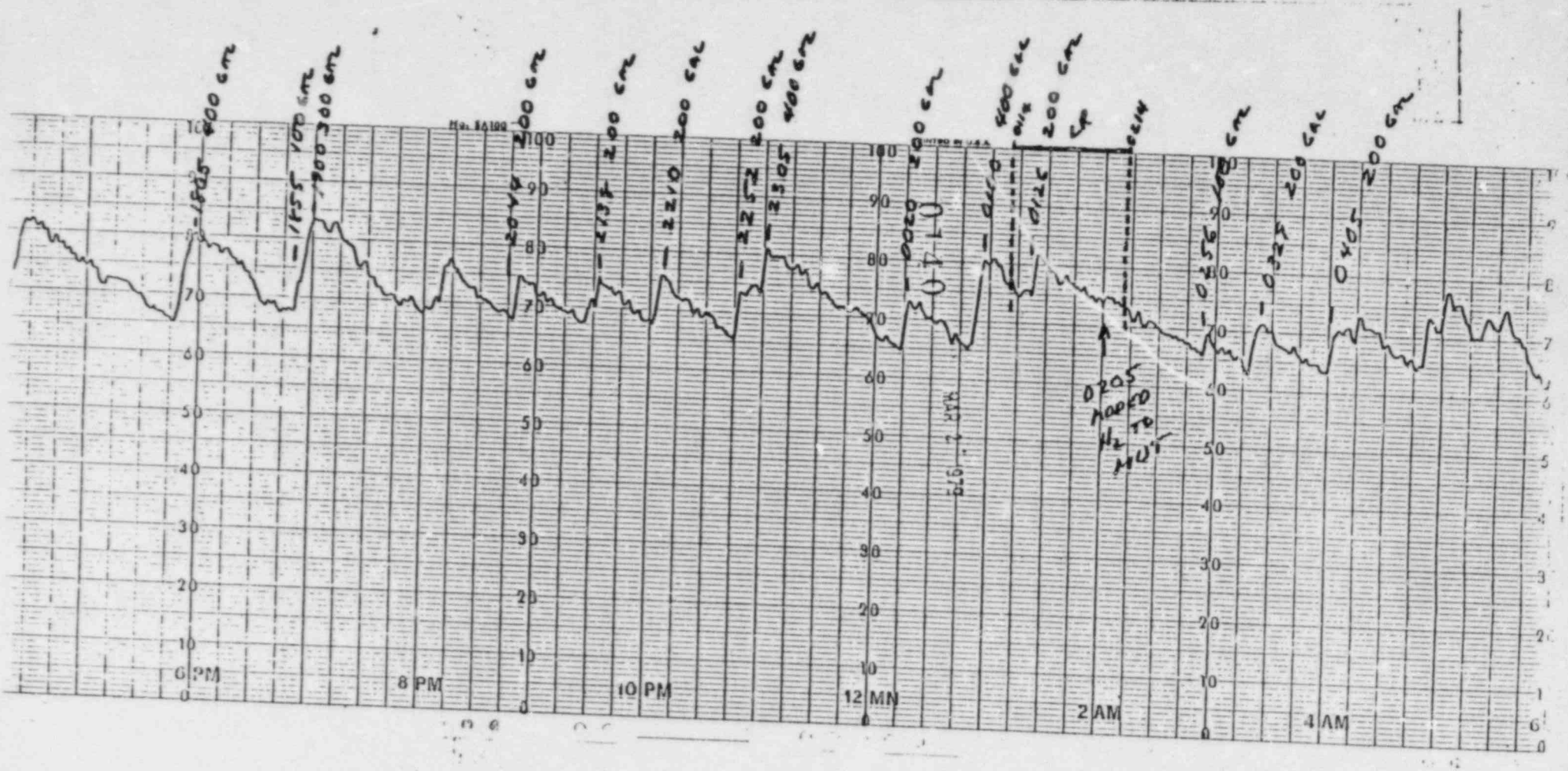
L.E. 0955 Switched L/O from "A" RCBT to "B" RCBT

1010 Added 350 gal DI, 150 gal "A" RCBT to RCS.

1065 CRD to Manual (2303-146) (Bkr trip test)

1101 CRD to Auto

EOH


6 PM
8 PM
10 PM
12 MN
2 AM
4 AM
0205 noted H2 to MW
400 CAL
200 CAL

GENERATION MAINTENANCE SYSTEM
MANUAL PERFORMANCE FORM

DATE ISSUED

SCHED. DATE _____

REFERENCE MANUAL _____

PROCEDURE NO. 2301-3D1

DEPT RESP - _____

TASK NO. - _____

WORK ORDER NO. - _____

ACCOUNT NO. - _____

GC CODE - _____

COMPONENT NO. - _____

COMPONENT DESC - _____

PLANT CONDITION (MODE) SU(2) OP(1) HD(4) CD(5) RF(6) HS(3) LR(1)

FREQUENCY _____ COMPONENT STATUS _____

SPECIFIC DAY _____ INTERFERENCE _____

PRIORITY _____

COMP. LOCATION - BDG _____ LVL _____ GRID _____

PART NO	QUAN	SPEC EQUIPMENT

DEPENDENT TASKS

ASSIST DEPT

SHIFT FOREMAN APPROVAL TO COMMENCE WORK — SIGNATURE _____ DATE _____ RWP NO _____ TAG NO _____

QC NOTIFIED BEFORE STARTING WORK (IF APPLICABLE ONLY) — SIGNATURE _____ DATE _____

COMPONENT RETURNED TO SERVICE (SHIFT FOREMAN) — SIGNATURE _____ DATE _____

TXN. CD. (1-2)	ACT. (3)	COMPONENT NUMBER: SYS. (4-7)	COMP. TYPE (8-11)	COMP. ID. (12-15)	LP (16)	LOCATION/UNIT (17-22)	TYPE TASK (23-24)	TASK IDENTIFICATION (25-32)	SCHEDULE NUMBER (33-38)
40	A	TMI	2301	3D-1		036002	TS	2391-3D1	79 E810 M

RESULTS (51) COMPLETE THIS SECTION (401A)

DATE PERFORMED (39) MONTH 03 DAY 21 YEAR 79

CHECK ONE ONLY

(X)	1	PERFORMED OK
( )	2	EXCEPTIONS
( )	3	DEFICIENCIES
( )	4	BOTH E S AND D S
( )	5	NOT PERFORMED

ACTUAL MANHOURS (45) 000001.51

ACTION TAKEN CODE (52)

REASON NOT PERFORMED (54)

PERFORMED BY EMPLOYEE NUMBER (60) 061404 SIGNATURE - _____

APPROVED BY EMPLOYEE NUMBER (65) 054551 SIGNATURE - _____

WITNESSED BY EMPLOYEE NUMBER (70) _____ SIGNATURE - _____

CORRECTIVE MAINTENANCE JOB TICKET NUMBER (75) _____

403A (1) DUPLICATE AS ABOVE (5-38)

402 (1) DUPLICATE AS ABOVE (5-38)

RESULTS DESCRIPTION

(39) _____

(61) _____

ASSISTING DEPARTMENTS

CODE (39) _____

HOURS(44) _____

CODE (50) _____

HOURS(55) _____

404A (1) DUPLICATE AS ABOVE (5-38)

(39) _____

(61) _____

EDL

TMI-105 12-78

rcs1

DATE: 3/21/79 REACTOR COOLANT LEAKAGE TEST
TIME: 1:14:33 SP 2301-3D1

NOTE: IF OPERATOR ACTION DECREASED RCS VOLUME THE DATA ENTRY FOR THAT VOLUME MUST BE NE
...YOU MUST ENTER DEC. PT. WITH LEAKAGE VALUE ...

DESIRED INTERVAL (1-8 HOURS)
1
ENTER OPERATOR CAUSED CHANGE TO THE RCDT FROM DG 4 (2301-3D1)
0
ENTER OPERATOR CAUSED CHANGE FROM DG 4 (2301-3D1)
207.
ENTER IDENTIFIED LEAKAGE FROM DG 3 (2301-3D1) (GPM)
0
ENTER PRIMARY TO SECONDARY OTSG TUBE LEAK (GPM)
0

TIME	TCA (F)	THA (F)	TCB (F)	THB (F)	TAVE (F)	PRZR LVL (IN)	RCDT LVL (IN)	RCDT LVL (INCHES)
1:14:56:	556.036	605.700	557.041	605.727	581.402	215.301	75.738	76.000
2:14:56:	556.041	605.555	557.430	605.510	581.201	225.100	71.482	79.441

GROSS LEAK RATE (<30 GPM): 0.0519 GPM

TOTAL IDENTIFIED RCS LEAK RATE (<10 GPM): 4.1838 GPM

NET UNIDENTIFIED LEAK RATE (<1 GPM): 1.8680 GPM

OPERATOR: Earl O. Hemmas
APPROVED: C Arthur

Corrected — .22 GPM

STOP 0

EOH

"EVALUATION"

1021

1001-4

Three Mile Island Nuclear Station

SIDE 2

Nuclear Safety/Environmental Impact Evaluation

1 Procedure 2301-3D1 (No) RCS Inventory (Title) Temporary Change Notice No

2 Nuclear Safety Evaluation

Does the attached procedure change:

*(a) increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety? . . . . . yes ☐ no ☒

*(b) create the possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report? . . . . . yes ☐ no ☒

*(c) reduce the margin of safety as defined in the basis for any technical specification? . . . . . yes ☐ no ☒

Details of Evaluation (Explain why answers to above questions are "no". Attach additional pages if required.)

Change more accurately takes into account RC leakage, which is cooled in the RCDT. Change does not affect any operating conditions, and has no effect on margin of safety

Evaluation By T E Mock Date 3/11/87

3 Environmental Impact Evaluation

Does the attached procedure change:

(a) possibly involve a significant environmental impact? . . . . . yes ☐ no ☐
(if 3(a) is "yes", answer questions (b) and (c) and fill in "Details of Evaluation" below. If "no", state why by filling in the "Details of Evaluation" below) . . . . . yes ☐ no ☐

*(b) have a significant adverse effect on the environment? . . . . . yes ☐ no ☐

*(c) involve a significant environmental matter or question not previously reviewed and evaluated by the N.R.C. . . . . yes ☐ no ☐

Details of Evaluation (Attach additional pages if required)

Evaluation By _____ Date _____

4 Unit Superintendent requests PORC review ☐ Check if YES.

5 Approval

Evaluation Accompanying PCR

[signature] (Unit Superintendent) 3/11/87 (Date)

Evaluation Accompanying TCN

Approval _____ (SRO Licensee) _____ (Date)

Reviewed _____ (Member of Plant Staff) _____ (Date)

Approval _____ (Unit Superintendent) _____ (Date)

* The Evaluation "Accompanying a PCR" evaluation and approval chain may be followed at anytime.

EDH

AP 1001

Form 1001 - 5

Three Mile Island Nuclear Station
Temporary Change Notice (TCN)

SIDE 1

NOTE Instructions and guidelines in AP 1001 must be followed when completing this form.

TCN NO. 2 77 (From TCN Log)

Unit No. 2

Date 3/16/79

1 Procedure 2301-3A1 (No) RCS Inventor (Title)

2 Change (Include page numbers, paragraph numbers, and exact wording of change.)

see attached.

3. Reason for Change:

To more accurately account for RCS leakage collected in the drain tank.

4 Recommended by J E Mecke 3/16/79 (Date) 5. J E Mecke (Supervisor's Signature) 3/16/79 (Date)

6 Duration of TCN - No longer than ninety days from effective date of TCN or as in (a) or (b) below whichever occurs first.

(a) TCN will be cancelled by a procedure revision issued as a result of a Procedure Change Request to be submitted by MORCK (Supervisor Submitting TCN) (Submit PCR as soon as possible) ☒

(b) TCN is not valid after _____ (fill in circumstances which will result in TCN being cancelled) ☐

7. (a) Is the procedure on the Nuclear Safety Related Procedure List? (Sec. AP 1001 – Appendix B) If "Yes", complete Nuclear Safety Evaluation. (Side 2 of this Form) Yes ☒ No ☐

(b) Is the procedure on the Environmental Impact Procedure List? (Sec. AP 1001 – Appendix B) If "Yes", complete Environmental Evaluation. (Side 2 of this Form) Yes ☐ No ☒

(c) Does the change effect the intent of the original procedure? Yes ☒ No ☐

NOTE: If all answers are "no" the change may be approved by the Shift Supervisor. If question (c) is answered "yes", the change must be reviewed by the PORC and approval by the Station/Unit Superintendent prior to implementation. If the answer to question (c) is "no" the change may be approved by two members of the plant management staff at least one of whom holds a senior reactor operators license on the unit affected in accordance with paragraph 3.6.4.2 of AP 1001.

8. Review and Approval

Block (c) "yes"

Approved _____ (Shift Supervisor/Foreman) 3/16/79 (Date)

Reviewed J E Mecke 3/16/79

_____ 3/16/79

Members _____ 3/16/79

Of PORC R W Borsum 3/16/79

Contacted _____ (PORC Members) 3/16/79 (Date)

Approved _____ (Unit Superintendent) _____ (Date)

Block (c) "no"

Approved _____ (SRO License) _____ (Date)

_____ (Member Plant Mng. St.) _____ (Date)

Reviewed _____ (Chairman of PORC) _____ (Date)

Approved _____ (Unit Superintendent) _____ (Date)

NOTE The block (c) "Yes" review and approval chain may be followed at anytime.

9 Approval

Manager, Generation Quality Assurance _____ Date _____

NOTE M.G.Q.A. approval required only on certain Administrative Procedures listed in Enclosure 7 of AP 1001

10. TCN is Cancelled _____ (Shift Supervisor/Shift Foreman) _____ (Date)

TMI-56 Rev. 8

Eat

Attachment 11

Note: This attachment is not valid if operator caused RCDT level changes occurred

RCDT temperature (from computer pt 1033) L

(B) Calculate density (in $\frac{lb}{ft^3}$) of water in RCDT. Use line A, an assumed pressure of 15 psia, and Table 1. Interpolate

	0 psia	500 psia
50°F	.016024	.015198
100°F	.016130	.016106

(Density $[\frac{lb}{ft^3}]$ = $\frac{1}{v}$ $[\frac{1}{ft^3/lb}]$.) Density = 62.1

(C) Calculate density of RC. Use average Tave and Figure 1.

Density = 44.57

(D) Convert identified leak rate, collected in RC drain tank, to equivalent RC gallons.

Ident Leak Rate (from printout) 4.1939 × $\frac{\text{Density of RCDT (line B)}}{\text{Density of RCS (line C)}}$ $\frac{62.1}{44.57}$

RC equivalent Identified Leak Rate = 5.8294 gpm

(E) Subtract Equivalent Identified Leak Rate from Total Leak Rate to get Unidentified.

EOI

Attachment III ... cont.

Total Leak Rate 6.619 gpm 3.93
− Equivalent Leak Rate 5.494 gpm 2.813
= Unidentified Leak Rate .225 gpm. 1.116

Accept Criteria

Total Leak Rate must be < 30 gpm.
Total Identified Leak Rate must be < 10 gpm.
Net Unidentified Leak Rate must be < 1 gpm.

EOA

I assisted in interviewing three TMI Unit 2 Control Room Operators (CRO's), Hugh McGovern, Earl Hemmila and Mark Coleman, on April 10, 1980, at the NRC trailers at the site. Also participating in the interview was David H. Gamble of the Office of Inspector and Auditor. As part of the interview, I asked each of the operators a series of questions. The substance of these questions and the operator's answers derived from my memory and sparse notes, are briefly listed in the two attached sheets. Each operator was asked to sign a written statement which Mr. McGovern and Mr. Hemmila did. Mr. Coleman participated in the formulation and editing of a statement, but decided not to sign it. Where the answer to a question appears in the statement it is not included.

Donald C Kirkpatrick

Donald C. Kirkpatrick

Operator Earl Hemmila

Q What is your understanding of the purpose of the leak rate test?

A To prevent the release or minimize the release of radiation to the environment. Also, if the leak rate is high it could get bigger.

Q Have you ever received training on the connection between the unidentified leak rate and a crack in the reactor pressure boundary as discussed in the SAR?

A No.

Q Describe the leak rate test including all of the elements that go into the calculation of the leak rate.

A Gave a knowledgeable discussion of the test including the changes in the RCS density, pressurizer level, makeup tank and RC drain tank. Discussed the addition of water during the test and necessity for entering this in the computer.

Q Did you ever have difficulty getting good leak rate test results, and what were the main reasons for the difficulty?

A Yes. Didn't know why, but said that a lot of things could happen, for instance, temperature changes.

Q Were you aware of problems with the leak rate test computer program and the inaccuracies in the program?

A Yes.

Q What was normally done with a computer test record that gave unacceptable results?

A See statement.

Q In what ways can the leak rate test results be changed by operator actions?

A See statement.

Q Did you ever use any of these methods to effect the results of a leak rate test?

A See statement.

(Subsequently Mr. Hemmila was presented with records showing that hydrogen had been added during the performance of one of his leak rate tests. This is also discussed in the statement and copies of the material are attached to the statement.

Q Did you know of any one else who used these methods to effect the leak rate test results?

A See statement.

Q Did any of your superiors ever tell you to do anything to change the results of a leak rate test?

A See statement.

U. S. NUCLEAR REGULATORY COMMISSION

TRANSCRIPT OF STATEMENT

DATE: April 10, 1980

TIME: 10:00 A.M.

I Earl D. Hemmila do hereby make the following free and voluntary statement to Mr. David H. Gamble, who has identified himself to me as an Investigator for the U. S. Nuclear Regulatory Commission. I understand this statement is being made in connection with an official NRC Investigation and may, if necessary, be used in judicial or administrative action. I make this statement with no threats having been made against me or promises extended to me.

In my capacity as a control room operator at Unit #2 of the Three Mile Island Nuclear Station, I performed leak rate tests from approximately June 1978 through March 1979.

During any leak rate test I performed, if water had to be added, the tests were generally discarded. These tests were discarded by me after mentioning it to Hugh McGovern, because of the possibility of the water adversely affecting the test result.

In this type of situation, we typically did not enter the amount of water added to the computer since we would have already decided to scrap the test and discard the results. A new test would then be initiated when the plant was in a stable condition.

Until informed recently by NRC officials, I was not aware that the addition of hydrogen during a leak rate test could affect the results of the test. It was entirely possible that I did add hydrogen during a test (as indicated on the attached documents concerning a March 21, 1979 test). Hydrogen levels were checked each morning by Unit 2 superintendent Logan, so control room operators were sensitive to maintaining the required hydrogen levels. Any hydrogen I may have added certainly was not an attempt to obtain good test results.

I know of no other individuals who added water or hydrogen or performed any other activities in order to obtain a good leak rate test result when it would not otherwise have been good.

I never felt pressured to get good leak rate test results by anyone. The reaction of my supervisors when I informed them of an unacceptable leak rate test result (either one that was scrapped because we had to add water or a test that just did not pass) was merely to perform another test. Since there was no requirement to retain unacceptable test results, such results were merely discarded.

Although I was aware that there were some difficulties with the computer program, until informed today by NRC officials, I was not aware that the program reflected water being added to the system at about 5 pounds per gallon, when the water was actually at about 8 pounds per gallon.

I have read the above statement, consisting of four pages, and find it true and complete to the best of my knowledge and belief.

/s/ Earl D. Hemmila

Attachments: 10 pages

Subscribed and sworn to before me this
10th day of April 1980.

/s/ David H. Gamble

U.S. NUCLEAR REGULATORY COMMISSION

DATE April 10, 1980
TIME 10:00 A.M.

I EARL D. Hemmila do hereby make the following free and voluntary statement to Mr. David H. Gamble, who has identified himself to me as an Investigator for the U. S. Nuclear Regulatory Commission. I understand this statement is being made in connection with an official NRC Investigation and may, if necessary, be used in judicial or administrative action. I make this statement with no threats having been made against me or promises extended to me.

In my capacity as a control room operator at Unit #2 of the Three Mile Island Nuclear Station, I performed leak rate tests from approximately June 1978 through March 1979.

During any leak rate test I performed, if water had to be added, the tests were ~~most~~ generally discarded. These tests were discarded by me after mentioning it to EDH EDH EDH Hugh McGovern, because of the possibility of the water adversely affecting the test result.

In this type of situation, we typically did not enter the amount of water added to the computer since we would have already decided to scrap the test and discard the results. A new test would then be initiated when the plant was in a stable condition. Until informed recently by NRC officials, I was not aware that [redacted] the addition of hydrogen during a leak rate test could affect the results of the test. It was entirely possible that I did add hydrogen during a test (as [redacted] indicated on the attached documents concerning a March 21, 1979 test). Hydrogen levels were checked each morning by Unit 2 superintendent Logan so control room operators were sensitive to maintaining the required hydrogen levels. Any hydrogen I may have added certainly was not an attempt to obtain good test results.

I know of no other individuals who added water or hydrogen or performed any other activities in order to obtain a good leak rate test result when

it would not otherwise have been good.

I never felt pressured to get good leak rate test results by anyone. The reaction of my supervisors when I informed them of an unacceptable leak rate test result (either one that was scrapped because we had to add water or a test that just did not pass) was merely to perform another test. Since there was no requirement to retain unacceptable test results, such results were merely discarded.

Although I was awayre that there were some difficulties with the computer program, until informed today by NRC officials, I was not aware that the program reflected water being added to the system at about 5 pounds per gallon, when the water was actually at about 8 pounds per gallon.

I have read the above statement, consisting of four pages, and find it true and complete to the best of my knowledge and belief.

Earl D. Hennies

Attachments: 10 pages

Subscribed and sworn to before me this 10th day of April 1980

Dan P. Hall

collected H2

rcs1

DATE: 3/21/79
TIME: 1:14:33

REACTOR COOLANT LEAKAGE TEST
SP 2301-3D1

NOTE: IF OPERATOR ACTION DECREASED RCS VOLUME THE DATA ENTRY FOR THAT ACTION MUSTBE NEGAT
...YOU MUST ENTER DEC. PT. WITH LEAKAGE VALUE ...

DESIRED INTERVAL (1-8 HOURS)
1

ENTER OPERATOR CAUSED CHANGE TO THE RCDT FROM DG 4 (2301-3D1)
0

ENTER OPERATOR CAUSED CHANGES FROM DG 4 (2301-3D1)
207.

ENTER IDENTIFIED LEAKAGE FROM DG 3 (2301-3D1) (GPM)
7

ENTER PRIMARY TO SECONDARY OTSG TUBE LEAK (GPM)
0

TIME	TCA (F)	THA (F)	TCB (F)	THB (F)	TAVE (F)	PRZR LVL (IN)	MUTK LVL (IN)	RCDT LVL (INCHES)
1:14:56:	556.836	605.780	557.041	605.727	581.402	225.301	75.736	76.005
2:14:56:	556.041	605.555	557.430	605.516	581.201	225.108	71.462	79.448

GROSS LEAK RATE (<30 GPM): 6.0519 GPM

TOTAL IDENTIFIED RCS LEAK RATE (<10 GPM): 4.1033 GPM

UNIDENTIFIED LEAK RATE (<1 GPM): 1.8980 GPM

OPERATOR: Earl O. Hemmila E.O. HEMMILA

APPROVED: C Guthrie C.L. GUTHRIE

Collected — .22 gpm

EOH

March 20, 1979

1030 De-activated Cable Room Halon System - set fire watch
1048 HP-R-215 back in service
1105 Added 250 Gal DW to MU-T-1
1135 Tested DF-X-1A, started in 9.0 sec, added 500 Gal from AB bed to MU-T-1
1145 Added H2 to T-G to 76 psig
1213 ~~Relieved~~ and Tagged out DF-X-1B for Maintenance - added 250 gal DW
1213 Relieved the shift.
1220 added 300 gal DW to Res.
1230 ~~RP~~
1730 Assumed shift duties as before ~~Relieved~~
1301 Increased Generator MVARS to 200 in - they lost several big units on down the pike and they want us to help out
1313 Opened Aux Bldg Shield door
1315 Cable room halon syst back to normal
1330 Aux Bldg Shield door closed added 250 Gal DW to MU-T-1
1340 Stopped Z-2 fan on MDCT
1425 Backwashed 3CCCW Coolers
1438 Added 400 Gal DW to MU-T-1
~~Relieved~~
1500 Relieved the shift ~~RP~~ Fredericks, Rx Power = 98%, 2755#, 582°F, GP 6/7 @ 96%, GP 8 @ 27%, 912 MWe, 224 MWt
1545 ADDED 252 gal DW TO MU-T-1
1622 ADDED 100 gal DW TO MU-T-1
1623 ADDED 400 gal from RCDT-A to MU-T-1
1800 Asked SB-LCCH HEADSETS - SAT.
1805 ADDED 400 gal from RCDT-A TO MU-T-1
1835 STARTED RELEASE OF SEC WASTE TANK.
1845 STARTED MDCT FANS A/B IN FAST
1855 ADDED 100 Gal DW TO MU T-1
1900 ADDED 300 GAL FROM RCDT A TO MUT 1
2014 ADDED 200 gal FROM ~~RCDT~~ EP DW TO MUT-1
2138 ADDED 200 gal from RCDT-A
2345 TERMINATED SEC WASTE TANK RELEASE.
2210 ADDED 200 gal from RCDT A
2238 Conducted Shift Turnover (1930 Relief) SAT.
2252 ADDED 200 gal DW to MU-T-1

3/21/79

2300 Assumed the shift. 98% Power RCS Boron 1035 Rods Gr.5 100% Dc/p 777 R. 8 2770. Sending Aux steam to Unit I. & receiving condensate in return. Burst Tube Leak th. Pzr htrs. spray & 2 BK. of Lt in manual. Gener.

2305 Added 400 gal Dem H_2O.

0020 Added 200 gal from RCBT "A"

0027 Adj Vars to 170.

0100 Added 400 gal Dem H_2O.

0115 Started 2322-R3. Placed HP-R-219 in defeat.

0126 Added 200 gal Dem H_2O

0205 Added H_2 to MUT.

0236 Added 100 gal H_2O from RCBT "A"

0329 Added 200 gal H_2O from RCBT A

0405 Added 200 gal Dem H_2O

L.E. 0332 Started to add H_2 to turbine Gen.

0415 Secured adding H_2 To turbine Gen.

0417 added 100 gal Dem H_2O.

0455 Added 200 gal Dem H_2O.

0557 Started A Diesel Gen to test operation prior to tagging B Diesel o.o.s. Tested Sat. for ES Standby.

0602 B Diesel Gen tagged o.o.s.

0605 Added 200 Gal from RCBT A. & 50 Gal Dem H_2O. Gener

7-3 Joseph R Colyer ←

0645 Received the shift, Conditions as Before.

0735 Heat Bal Cal 2302-31, Sat.

L.E. 0715 Added 250 gal from RCBT "A" To MU-T-1

0802 Added 250 gal of DI H_2O to MU-T-1

0826 Connected 2303-MC on Ch "B" RPS Cab.

0845 Placed "B" RPS Cab in Man. Bypass 2303-MC

0850 Added 250 gal DI H_2O to MU-T-1

0900 Conducted Retest of 2303-M35 and 2C-A/B for DC-V103 E, Sat.

0930 Added 250 gal Batch to RCS.

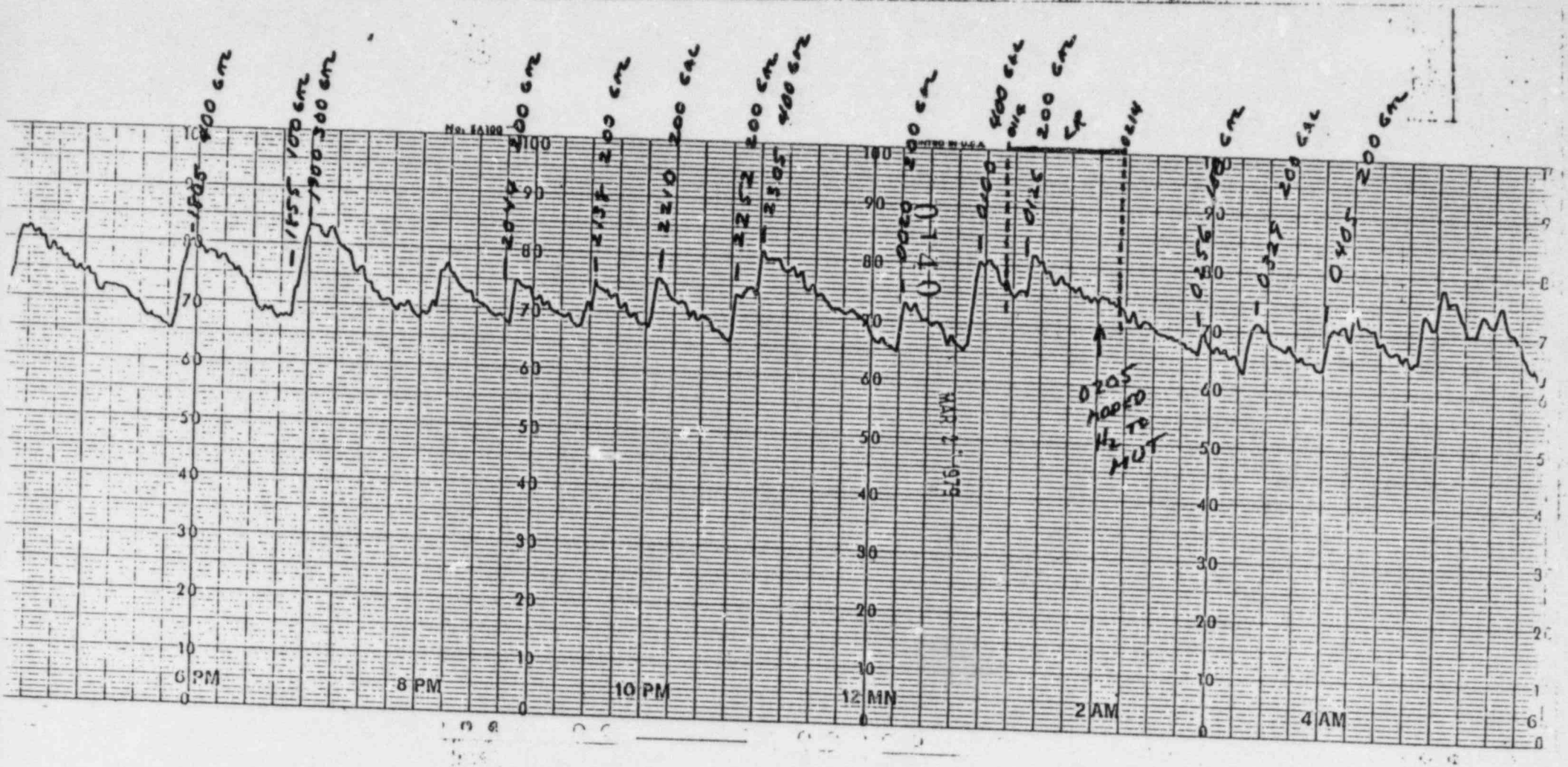
L.E. 0945 Switched L/O from "A" RCBT to "B" RCBT

1010 Added 350 gal DI; 150 gal "A" RCBT to RCS.

1055 CRD to Manual (2303-MC) (Blk trip test)

1101 CRD to Auto

904


6 PM
8 PM
10 PM
12 MN
2 AM
4 AM
MAR 1 1979
0205 MARKED H2 TO MUT

GENERATION MAINTENANCE SYSTEM
MANUAL PERFORMANCE FORM

SCHED. DATE _____

DATE ISSUED

REFERENCE MANUAL _____

PROCEDURE NO. 2301-3D1

DEPT RESP - _____

TASK NO.- _____

WORK ORDER NO. - _____

ACCOUNT NO. - _____

GC CODE - _____

COMPONENT NO. - _____

COMPONENT DESC - _____

PLANT CONDITION (MODE) SU(2) OP(1) HD(4) CD(5) RF(6) HS(3) LR(1)

FREQUENCY _____ COMPONENT STATUS _____

SPECIFIC DAY _____ INTERFERENCE _____

PRIORITY _____

COMP. LOCATION - BDG _____ LVL _____ GRID _____

PART NO	QUAN	SPEC EQUIPMENT

DEPENDENT TASKS	ASSIST DEPT

SHIFT FOREMAN APPROVAL TO COMMENCE WORK _____ SIGNATURE _____ DATE _____ RWP NO _____ TAG NO _____

QC NOTIFIED BEFORE STARTING WORK (IF APPLICABLE ONLY) _____ SIGNATURE _____ DATE

COMPONENT RETURNED TO SERVICE (SHIFT FOREMAN) _____ SIGNATURE _____ DATE

TXN. CD. (1-3)	ACT. (4)	COMPONENT NUMBER: SYS. (5-8)	COMP. TYPE	COMP. ID.	LP (16)	LOCATION/UNIT (17-22)	TYPE TASK (23-24)	TASK IDENTIFICATION (25-32)	SCHEDULE NUMBER (33-38)
400	A	TMI	2301	3D-1		036002	TS	2301-3D1	790810M

RESULTS (51) COMPLETE THIS SECTION (401A)

DATE PERFORMED (39) 03 MONTH | 21 DAY | 79 YEAR

CHECK ONE ONLY

- (X) 1 PERFORMED OK
- ( ) 2 EXCEPTIONS
- ( ) 3 DEFICIENCIES
- ( ) 4 BOTH E S AND D S
- ( ) 5 NOT PERFORMED

ACTUAL MANHOURS (45) 00001.5

ACTION TAKEN CODE (52)

REASON NOT PERFORMED (54)

PERFORMED BY EMPLOYEE NUMBER (60) 06464

APPROVED BY EMPLOYEE NUMBER (65) 05451

WITNESSED BY EMPLOYEE NUMBER (70)

SIGNATURE - _____

SIGNATURE - _____

SIGNATURE - _____

CORRECTIVE MAINTENANCE JOB TICKET NUMBER (75)

403A (1) DUPLICATE AS ABOVE (5-38)

402 (1) DUPLICATE AS ABOVE (5-38)

RESULTS DESCRIPTION

(39)

(61)

ASSISTING DEPARTMENTS

CODE (39)

HOURS(44)

CODE (50)

HOURS(55)

404A (1) DUPLICATE AS ABOVE (5-38)

(39)

(61)

EAL

TMI-105 12-78

rcs1

DATE: 3/21/79 REACTOR COOLANT LEAKAGE TEST
TIME: 1:14:33 SP 2301-3D1

NOTE: IF OPERATOR ACTION DEGRADES RCS VOLUME THE DATA ENTRY FOR THAT ACTION MUST BE
...YOU MUST ENTER DEC. PT. WITH LEAKAGE VALUE ...

DESIRED INTERVAL (1-8 HOURS)
1
ENTER OPERATOR CAUSED CHANGES TO THE RCDT FROM DS 4 (2301-3D1)
0
ENTER OPERATOR CAUSED CHANGES FROM DS 4 (2301-3D1)
207.
ENTER IDENTIFIED LEAKAGE FROM DS 3 (2301-3D1) (GPM)
0
ENTER PRIMARY TO SECONDARY OTSG TUBE LEAK (GPM)
0

TIME	TCA (F)	THA (F)	TCB (F)	THB (F)	TAVE (F)	PRZR LVL (IN)	RCDT LVL (INCHES)	RCDT LVL (INCHES)
1:14:56:	556.036	605.700	557.041	605.727	581.402	215.301	75.736	76.003
2:14:56:	556.041	605.555	557.430	605.510	581.201	225.108	71.462	79.441

GROSS LEAK RATE (<30 GPM): 6.0519 GPM

TOTAL IDENTIFIED RCS LEAK RATE (<10 GPM): 4.1833 GPM

NET UNIDENTIFIED LEAK RATE (<1 GPM): 1.8680 GPM

OPERATOR: Earl O. Hemmat

APPROVED: C Guthrie

Corrected — .22 GPM

EOH

STOP 0

"EVALUATION"

1001

1001-4

Three Mile Island Nuclear Station

SIDE 2

Nuclear Safety/Environmental Impact Evaluation

1. Procedure 2301-3D1 (No) RCS Inventory (Title) Temporary Change Notice No

2. Nuclear Safety Evaluation

Does the attached procedure change:

*(a) increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety? . . . . . yes ☐ no ☑

*(b) create the possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report? . . . . . yes ☐ no ☑

*(c) reduce the margin of safety as defined in the basis for any technical specification? . . . . . yes ☐ no ☑

Details of Evaluation (Explain why answers to above questions are "no". Attach additional pages if required.)

Change more accurately takes into account RC leakage, cable, and coolant in the RCDT. Change does not affect any operating conditions, and has no effect on nuclear safety.

Evaluation By J E Mouck Date 3/16/7

3. Environmental Impact Evaluation

Does the attached procedure change:

(a) possibly involve a significant environmental impact? . . . . . yes ☐ no ☐
(if 3(a) is "yes", answer questions (b) and (c) and fill in "Details of Evaluation" below.
If "no", state why by filling in the "Details of Evaluation" below) . . . . . yes ☐ no ☐

* (b) have a significant adverse effect on the environment? . . . . . yes ☐ no ☐

* (c) involve a significant environmental matter or question not previously reviewed and evaluated by the N.R.C. . . . . yes ☐ no ☐

Details of Evaluation (Attach additional pages if required)

Evaluation By _____ Date _____

4. Unit Superintendent requests PORC review ☐ Check if YES.

5. Approval

Evaluation Accompanying PCR

[signature] (Unit Superintendent) 3/16/7 (Date)

Evaluation Accompanying TCN

Approval _____ (SRO Licensee) _____ (Date)

Reviewed _____ (Member of Plant Staff) _____ (Date)

Approval _____ (Unit Superintendent) _____ (Date)

* The Evaluation "Accompanying a PCR" evaluation and approval chain may be followed at anytime.

EDH

AP 1001

Figure 1001 - 5

Three Mile Island Nuclear Station
Temporary Change Notice (TCN)

SIDE 1

NOTE Instructions and guidelines in AP 1001 must be followed when completing this form.

TCN NO. 2 77 (From TCN Log)

Unit No. 2

Date 3/16/79

1 Procedure 2301-3A1 (No) RCS Inventory (Title)

2. Change (include page numbers, paragraph numbers, and exact wording of change.)

see attached.

3. Reason for Change:

To more accurately account for RCS leakage collected in the drain tank.

4 Recommended by JE Marck 3/16/79 (Date) 5. JE Marck (Supervisor's Signature) 3/16/79 (Date)

6 Duration of TCN - No longer than ninety days from effective date of TCN or as in (a) or (b) below whichever occurs first.

(a) TCN will be cancelled by a procedure revision issued as a result of a Procedure Change Request to be submitted by MORCK (Supervisor Submitting TCN) (Submit PCR as soon as possible) ☒

(b) TCN is not valid after _____ (fill in circumstances which will result in TCN being cancelled) ☐

7. (a) Is the procedure on the Nuclear Safety Related Procedure List? (Sec. AP 1001 – Appendix B) If "Yes", complete Nuclear Safety Evaluation. (Side 2 of this Form) Yes ☒ No ☐

(b) Is the procedure on the Environmental Impact Procedure List? (Sec. AP 1001 – Appendix B) If "Yes", complete Environmental Evaluation. (Side 2 of this Form) Yes ☐ No ☒

(c) Does the change effect the intent of the original procedure? Yes ☒ No ☐

NOTE: If all answers are "no" the change may be approved by the Shift Supervisor. If question (c) is answered "yes", the change must be reviewed by the PORC and approval by the Station/Unit Superintendent prior to implementation. If the answer to question (c) is "no" the change may be approved by two members of the plant management staff at least one of whom holds a senior reactor operators license on the unit affected in accordance with paragraph 3.6.4.2 of AP 1001.

8. Review and Approval

Block (c) "yes"

Approved _____ (Shift Supervisor/Foreman) 3/16/79 (Date)

Reviewed JE Marck 3/16/79

Members _____ 3/16/79

Of PORC RW Bevan 3/16/79

Contacted _____ (PORC Members) 3/16/79 (Date)

Approved _____ (Unit Superintendent) _____ (Date)

Block (c) "no"

Approved _____ (SRO License) _____ (Date)

_____ (Member Plant Mng. Staff) _____ (Date)

Reviewed _____ (Chairman of PORC) _____ (Date)

Approved _____ (Unit Superintendent) _____ (Date)

NOTE The block (c) "Yes" review and approval chain may be followed at anytime.

9 Approval

Manager, Generation Quality Assurance _____ Date _____

NOTE M.G.Q.A. approval required only on certain Administrative Procedures listed in Enclosure 7 of AP 1001

10. TCN is Cancelled _____ (Shift Supervisor/Shift Foreman) _____ (Date)

TMI-56 Rev 8

Encl

Attachment 1A

Note: This attachment is not valid if operator caused RCDT level changes occurred

RCDT Temperature (from computer pt 1032) 1.5

(B) Calculate density ($\frac{lb}{ft^3}$) of water in RCDT. Use line A, an assumed pressure of 15 psia, and Table 1. Interpolate

	0 psia	500 psia
50°F	.016024	.015198
100°F	.016130	.016106

(Density $\left[\frac{lb}{ft^3}\right] = \frac{1}{v}\left[\frac{L}{ft^3/lb}\right]$.) Density = 62.1

(C) Calculate density of RC. Use average Tave and Figure 1.

Density = 44.57

(D) Convert identified leak rate, collected in RC drain tank, to equivalent RC gallons.

Ident Leak Rate (from print-out) 4.1839 $\times$ $\frac{\text{Density of RCDT line B}}{\text{Density of RCS line C}}$ $\frac{62.1}{44.57}$

RC equivalent Identified Leak Rate = 5.8294 gpm

(E) Subtract Equivalent Identified Leak Rate from Total Leak Rate to get Unidentified.

EOA

Attachment 11 ... cont.

Total Leak Rate 6.6519 gpm 3.939

− Equivalent Leak Rate 5.1194 gpm 2.813

= Unidentified Leak Rate .1325 gpm. 1.116

Accept Criteria

Total Leak Rate must be < 30 gpm.
Total Identified Leak Rate must be < 10 gpm.
Net Unidentified Leak Rate must be < 1 gpm.

EDH

I assisted in interviewing three TMI Unit 2 Control Room Operators (CRO's), Hugh McGovern, Earl Hemmila and Mark Coleman, on April 10, 1980, at the NRC trailers at the site. Also participating in the interview was David H. Gamble of the Office of Inspector and Auditor. As part of the interview, I asked each of the operators a series of questions. The substance of these questions and the operator's answers derived from my memory and sparse notes, are briefly listed in the two attached sheets. Each operator was asked to sign a written statement which Mr. McGovern and Mr. Hemmila did. Mr. Coleman participated in the formulation and editing of a statement, but decided not to sign it. Where the answer to a question appears in the statement it is not included.

Donald C Kirkpatrick

Donald C. Kirkpatrick

Operator Earl Hemmila

Q What is your understanding of the purpose of the leak rate test?

A To prevent the release or minimize the release of radiation to the environment. Also, if the leak rate is high it could get bigger.

Q Have you ever received training on the connection between the unidentified leak rate and a crack in the reactor pressure boundary as discussed in the SAR?

A No.

Q Describe the leak rate test including all of the elements that go into the calculation of the leak rate.

A Gave a knowledgeable discussion of the test including the changes in the RCS density, pressurizer level, makeup tank and RC drain tank. Discussed the addition of water during the test and necessity for entering this in the computer.

Q Did you ever have difficulty getting good leak rate test results, and what were the main reasons for the difficulty?

A Yes. Didn't know why, but said that a lot of things could happen, for instance, temperature changes.

Q Were you aware of problems with the leak rate test computer program and the inaccuracies in the program?

A Yes.

Q What was normally done with a computer test record that gave unacceptable results?

A See statement.

Q In what ways can the leak rate test results be changed by operator actions?

A See statement.

Q Did you ever use any of these methods to effect the results of a leak rate test?

A See statement.

(Subsequently Mr. Hemmila was presented with records showing that hydrogen had been added during the performance of one of his leak rate tests. This is also discussed in the statement and copies of the material are attached to the statement.

Q Did you know of any one else who used these methods to effect the leak rate test results?

A See statement.

Q Did any of your superiors ever tell you to do anything to change the results of a leak rate test?

A See statement.

U. S. NUCLEAR REGULATORY COMMISSION

TRANSCRIPT OF STATEMENT

DATE: April 10, 1980

TIME: 10:00 A.M.

I Earl D. Hemmila do hereby make the following free and voluntary statement to Mr. David H. Gamble, who has identified himself to me as an Investigator for the U. S. Nuclear Regulatory Commission. I understand this statement is being made in connection with an official NRC Investigation and may, if necessary, be used in judicial or administrative action. I make this statement with no threats having been made against me or promises extended to me.

In my capacity as a control room operator at Unit #2 of the Three Mile Island Nuclear Station, I performed leak rate tests from approximately June 1978 through March 1979.

During any leak rate test I performed, if water had to be added, the tests were generally discarded. These tests were discarded by me after mentioning it to Hugh McGovern, because of the possibility of the water adversely affecting the test result.

In this type of situation, we typically did not enter the amount of water added to the computer since we would have already decided to scrap the test and discard the results. A new test would then be initiated when the plant was in a stable condition.

Until informed recently by NRC officials, I was not aware that the addition of hydrogen during a leak rate test could affect the results of the test. It was entirely possible that I did add hydrogen during a test (as indicated on the attached documents concerning a March 21, 1979 test). Hydrogen levels were checked each morning by Unit 2 superintendent Logan, so control room operators were sensitive to maintaining the required hydrogen levels. Any hydrogen I may have added certainly was not an attempt to obtain good test results.

I know of no other individuals who added water or hydrogen or performed any other activities in order to obtain a good leak rate test result when it would not otherwise have been good.

I never felt pressured to get good leak rate test results by anyone. The reaction of my supervisors when I informed them of an unacceptable leak rate test result (either one that was scrapped because we had to add water or a test that just did not pass) was merely to perform another test. Since there was no requirement to retain unacceptable test results, such results were merely discarded.

Although I was aware that there were some difficulties with the computer program, until informed today by NRC officials, I was not aware that the program reflected water being added to the system at about 5 pounds per gallon, when the water was actually at about 8 pounds per gallon.

I have read the above statement, consisting of four pages, and find it true and complete to the best of my knowledge and belief.

/s/ Earl D. Hemmila

Attachments: 10 pages

Subscribed and sworn to before me this
10th day of April 1980.

/s/ David H. Gamble

U.S. NUCLEAR REGULATORY COMMISSION

DATE April 10, 1980
TIME 10:00 A.M.

I EARL O. Hemmila do hereby make the following free and voluntary statement to Mr. David H. Gamble, who has identified himself to me as an Investigator for the U. S. Nuclear Regulatory Commission. I understand this statement is being made in connection with an official NRC Investigation and may, if necessary, be used in judicial or administrative action. I make this statement with no threats having been made against me or promises extended to me.

In my capacity as a control room operator at Unit #2 of the Three Mile Island Nuclear Station, I performed leak rate tests from approximately June 1978 through March 1979.

During any leak rate test I performed, if water had to be added, the tests were generally ~~discarded~~ EDH discarded. These tests were discarded by me after mentioning it to EDH ~~[illegible]~~ EDH EDH Hugh McGovern, because of the possibility of the water adversely affecting the test result.

In this type of situation, we typically did not enter the amount of water added to the computer since we would have already decided to scrap the test and discard the results. A new test would then be initiated when the plant was in a stable condition. Until informed recently by NRC officials, I was not aware that [redacted] the addition of hydrogen during a leak rate test could affect the results of the test. It was entirely possible that I did add hydrogen during a test (as [redacted] indicated on the attached documents concerning a March 21, 1979 test). Hydrogen levels were checked each morning by Unit 2 superintendent Logan, so control room operators were sensitive to maintaining the required hydrogen levels. Any hydrogen I may have added certainly was not an attempt to obtain good test results.

I know of no other individuals who added water or hydrogen or performed any other activities in order to obtain a good leak rate test result when

it would not otherwise have been good.

I never felt pressured to get good leak rate test results by anyone. The reaction of my supervisors when I informed them of an unacceptable leak rate test result (either one that was scrapped because we had to add water or a test that just did not pass) was merely to perform another test. Since there was no requirement to retain unacceptable test results, such results were merely discarded.

Although I was awayre that there were some difficulties with the computer program, until informed today by NRC officials, I was not aware that the program reflected water being added to the system at about 5 pounds per gallon, when the water was actually at about 8 pounds per gallon.

D. 3 of 4 90H

I have read the above statement, consisting of four pages, and find it true and complete to the best of my knowledge and belief.

Earl D. Hemmis

Attachments: 10 pages

Subscribed and sworn to before me this 10th day of April 1980

Dan P. Hall

calculated H_2

rcs1

DATE: 3/21/79
TIME: 1:14:33

REACTOR COOLANT LEAKAGE TEST
SP 2301-3D1

NOTE: IF OPERATOR ACTION DECREASES RCS VOLUME THE DATA ENTRY FOR THAT ACTION MUSTBE NEGAT
...YOU MUST ENTER DEC. PT. WITH LEAKAGE VALUE ...

DESIRED INTERVAL (1-8 HOURS)
1

ENTER OPERATOR CAUSED CHANGES TO THE RCDT FROM DG 4 (2301-3D1)
0

ENTER OPERATOR CAUSED CHANGES FROM DG 4 (2301-3D1)
207.

ENTER IDENTIFIED LEAKAGE FROM DG 3 (2301-3D1) (GPM)
9

ENTER PRIMARY TO SECONDARY OTSG TUBE LEAK (GPM)
0

TIME	TCA (F)	THA (F)	TCB (F)	THB (F)	TAVE (F)	PRZR LVL (IN)	MUTK LVL (IN)	RCDT LVL (INCHES)
1:14:56:	556.036	605.780	557.041	605.727	581.402	225.301	75.736	76.005
2:14:56:	556.041	605.555	557.430	605.516	581.201	225.108	71.462	79.448

GROSS LEAK RATE (<30 GPM): 6.0519 GPM

TOTAL IDENTIFIED RCS LEAK RATE (<10 GPM): 4.1033 GPM

NET UNIDENTIFIED LEAK RATE (<1 GPM): 1.8880 GPM

OPERATOR: Earl D. Hemmila E.D. HEMMILA

APPROVED: C Guthrie C.L. GUTHRIE

CORRECTED — .22 GPM

EOH

March 20, 1979

1030 De-activated Cable Room Halon System - set fire watch
1048 HP-R-215 back in service
1105 Added 250 Gal DW to MU-T-1
1135 Tested DF-X-1A, started in 9.0 sec, added 500 Gal from AB load [to MU-T-1
1145 Add 1 Hz to T-G to 76 psig
1213 [illegible] and Tagged out DF-X-1B for Maintenance - added 250 gal DW
1213 Relieved the shift.
1220 added 300 gal DW to Res.
1230 RZ.
1730 Assumed shift duties as before [illegible]
1301 Increased Generator MVARS to 200 in - they lost several big units on down the pike and they want us to help out
1313 Opened Aux Bldg Shield door
1315 Cable room halon syst back to normal
1330 Aux Bldg Shield door closed added 250 Gal DW to MU-T-1
1340 Stopped 2-2 fan on MDCT
1425 Backwashed SCCCW Coolers
1438 Added 400 Gal DW to MU-T-1
[illegible]
1500 Relieved the shift [illegible], Rx Power = 98%, 2155#, 582°F, GP 6/7 @ 96%, GP 8 @ 27%, 912 MWe, 2274 MWt.
1545 ADDED 252 gal DW TO MU-T-1
1622 ADDED 100 gal DW TO MU-T-1
1623 ADDED 400 gal from RCST-A to MU-T-1
1800 RELIEVED SB-LCCW HEADSETS - SAT.
1805 ADDED 400 gal from RCST-A TO MU-T-1
1835 STARTED RELEASE OF SEC NON-ESS.
1815 STARTED MVCT FANS A/B IN FAST
1855 ADDED 100 Gal DW TO MU T-1
1900 ADDED 300 GAL FROM RCST A TO MU T-1
2014 ADDED 252 gal from [illegible] DW TO MU T-1
2138 ADDED 252 gal from RCST-A
2345 TERMINATED SEC NON-ESS RELEASE.
2210 ADDED 252 gal from RCST A
2238 conducted shift [illegible] MF-X-1B (Train Disch) SAT.
2252 ADDED 252 gal DW to MU T-1

3/21/79

2300 Assumed the shift. 98% Power RCS Boron 1035 Rods Gr. 5 100%. Dgly 77%. Z. & 277°. Sending Aux steam to unit I. & receiving condensate in return. Burst Tech Spec tkr. Prz ~~temp~~ spray & 2 BK. of ht in manual. Gener.

2305 Added 400 gal Dem H_2O.

0020 Added 200 gal from RCBT "A"

0027 Adj Vars to 170.

0100 Added 400 gal Dem H_2O.

0115 ~~Started~~ 2322-R3. Placed HPR-219 in defeat.

0126 Added 200 gal Dem H_2O

0205 Added H_2 to MUT.

0236 Added 100 gal H_2O from RCBT "A"

0329 Added 200 gal H_2O from RCBT A

2405 Added 200 gal Dem H_2O

L.E. 0332 ~~Started~~ to add H_2 to turbine Gen.

0415 Secured adding H_2 To turbine Gen.

0417 added 100 gal Dem H_2O.

0455 Added 200 gal Dem H_2O.

0557 ~~Started~~ A Diesel Gen to test operation prior to tagging B Diesel OOS. Tested Sat. In ES Standby.

0602 B Diesel Gen tagged O.O.S.

0605 Added 200 Gal from RCBT A. & 50 Gal Dem H_2O. Gener

7-3 Joseph R Colyer ←

0645 Relieved the shift, Conditions as Before.

0735 Heat Bal Cal 2302-31. Sat.

L.E. 0715 Added 250 gal from RCBT "A" To MU-T-1

0802 Added 250 gal of DI H_2O to MU-T-1

0826 Connected 2303-MC on Ch "B" RPS Cab.

0846 Placed "B" RPS Cab in Man. Bypass 2303-MC

0850 Added 250 gal DI H_2O to MU-T-1

0900 Conducted Retest of 2302-MC35 and 2C A/B for DC-V103 E, Sat.

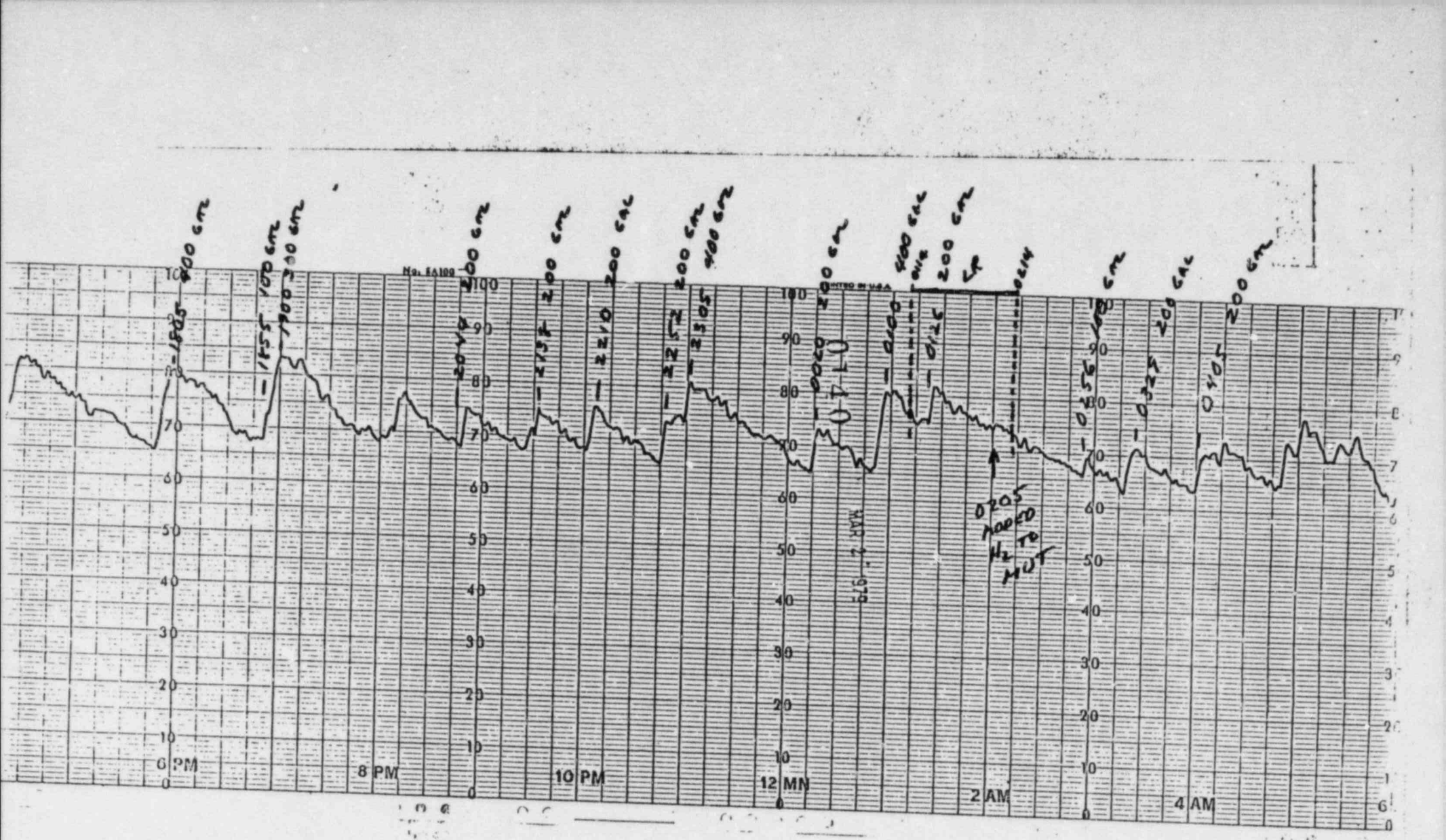
0930 Added 250 gal Batch to RCS.

L.E. 0945 Switched L/O from "C" RCBT to "B" RCBT

1010 Added 350 gal DI & 150 gal "A" RCBT to RCS.

1055 CRD to Manual (2303-MC) (Blk temp test)

1101 CRD to Auto


6 PM
8 PM
10 PM
12 MN
2 AM
4 AM
MAR 2 - 1975
0.205 MOLES H2 TO MIX

GENERATION MAINTENANCE SYSTEM
MANUAL PERFORMANCE FORM

DATE ISSUED

SCHED. DATE _____

REFERENCE MANUAL _____

PROCEDURE NO. 2301-3D1

DEPT RESP - _____

TASK NO.- _____

WORK ORDER NO. - _____

ACCOUNT NO. - _____

GC CODE - _____

COMPONENT NO. - _____

COMPONENT DESC - _____

PLANT CONDITION (MODE) SU(2) OP(1) HD(4) CD(5) RF(6) HS(3) LR(1)

FREQUENCY _____ COMPONENT STATUS _____

SPECIFIC DAY _____ INTERFERENCE _____

PRIORITY _____

COMP. LOCATION - BDG _____ LVL _____ GRID _____

PART NO	QUAN	SPEC EQUIPMENT

DEPENDENT TASKS	ASSIST DEPT

SHIFT FOREMAN APPROVAL TO COMMENCE WORK _____ SIGNATURE _____ DATE _____ RWP NO _____ TAG NO _____

QC NOTIFIED BEFORE STARTING WORK (IF APPLICABLE ONLY) _____ SIGNATURE _____ DATE _____

COMPONENT RETURNED TO SERVICE (SHIFT FOREMAN) _____ SIGNATURE _____ DATE _____

TXN. CD. (1-3)	ACT. (4)	COMPONENT NUMBER: SYS. (5)	COMP. TYPE	COMP. ID.	LP (16)	LOCATION/UNIT (17-22)	TYPE TASK (23-24)	TASK IDENTIFICATION (25-32)	SCHEDULE NUMBER (33-38)	
400	A	T	MI	2301	3D	1	036002	TS	2301-3D1	790810 N

RESULTS (51) COMPLETE THIS SECTION (401A)

DATE PERFORMED (39) 03 MONTH / 21 DAY / 79 YEAR

CHECK ONE ONLY
- (X) 1 PERFORMED OK
- ( ) 2 EXCEPTIONS
- ( ) 3 DEFICIENCIES
- ( ) 4 BOTH E S AND D S
- ( ) 5 NOT PERFORMED

ACTUAL MANHOURS (45) 00900010.5

ACTION TAKEN CODE (52)

REASON NOT PERFORMED (54)

PERFORMED BY EMPLOYEE NUMBER (60) 06470441 SIGNATURE - _____

APPROVED BY EMPLOYEE NUMBER (65) 05454551 SIGNATURE - _____

WITNESSED BY EMPLOYEE NUMBER (70) SIGNATURE - _____

CORRECTIVE MAINTENANCE JOB TICKET NUMBER (75)

403A (1) DUPLICATE AS ABOVE (5-38)

402 (1) DUPLICATE AS ABOVE (5-38)

RESULTS DESCRIPTION

01 (39)

(61)

ASSISTING DEPARTMENTS

CODE (39)

HOURS(44)

CODE (50)

HOURS(55)

404A (1) DUPLICATE AS ABOVE (5-38)

01 (39)

(61)

EDR

TMI-105 12-78

rcs1

DATE: 3/21/79 REACTOR COOLANT LEAKAGE TEST
TIME: 1:14:33 SP 2301-301

NOTE: IF OPERATOR ACTION DECREASES RCS VOLUME THE DATA ENTRY FOR THAT ACTION MUST BE ...YOU MUST ENTER DEC. PT. WITH LEAKAGE VALUE ...

DESIRED INTERVAL (1-8 HOURS)
1
ENTER OPERATOR CAUSED CHANGES TO THE RCDT FROM DS 4 (2301-301)
0
ENTER OPERATOR CAUSED CHANGES FROM DS 4 (2301-301)
207.
ENTER IDENTIFIED LEAKAGE FROM DS 3 (2301-301) (GPM)
0
ENTER PRIMARY TO SECONDARY OTSG TUBE LEAK (GPM)
0

TIME	TCA (F)	THA (F)	TCB (F)	THB (F)	TAVE (F)	PRZR LVL (IN)	RCDT LVL (INCHES)	RCDT LVL (INCHES)
1:14:56:	556.036	605.700	557.041	605.727	581.402	225.301	75.736	76.000
2:14:56:	556.041	605.555	557.430	605.510	581.201	225.100	71.462	79.441

GROSS LEAK RATE (<30 GPM): 0.0519 GPM

TOTAL IDENTIFIED RCS LEAK RATE (<10 GPM): 4.1833 GPM

NET UNIDENTIFIED LEAK RATE (<1 GPM): 1.8580 GPM

OPERATOR: Earl O. Hemmes
APPROVED: C Guthrie

Corrected — .22 GPM

EOH

STOP 0

"EVALUATION"

1001

1001-4

Three Mile Island Nuclear Station

SIDE 2

Nuclear Safety/Environmental Impact Evaluation

1. Procedure 2301-3D1 (No) RCS Inventory (Title) (Temporary Change Notice No)

2. Nuclear Safety Evaluation

Does the attached procedure change:

*(a) increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety? . . . . . yes ☐ no ☒

*(b) create the possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report? . . . . . yes ☐ no ☒

*(c) reduce the margin of safety as defined in the basis for any technical specification? . . . . . yes ☐ no ☒

Details of Evaluation (Explain why answers to above questions are "no". Attach additional pages if required.)

Change more accurately takes into account RC leakage collected in the RCDT. Change does not affect any operating conditions, and has no effect on nuclear safety.

Evaluation By J E Mauck Date 3/16/7

3. Environmental Impact Evaluation

Does the attached procedure change:

(a) possibly involve a significant environmental impact? . . . . . yes ☐ no ☐
(if 3(a) is "yes", answer questions (b) and (c) and fill in "Details of Evaluation" below.
If "no", state why by filling in the "Details of Evaluation" below) . . . . . yes ☐ no ☐

*(b) have a significant adverse effect on the environment? . . . . . yes ☐ no ☐

*(c) involve a significant environmental matter or question not previously reviewed and evaluated by the N.R.C. . . . . yes ☐ no ☐

Details of Evaluation (Attach additional pages if required)

Evaluation By _____ Date _____

4. Unit Superintendent requests PORC review ☐ Check if YES.

5. Approval

Evaluation Accompanying PCR

_____ (Unit Superintendent) 3/16/7 (Date)

Evaluation Accompanying TCN

Approval _____ (SRO Licensee) _____ (Date)

Reviewed _____ (Member of Plant Staff) _____ (Date)

Approval _____ (Unit Superintendent) _____ (Date)

*(1) The Evaluation "Accompanying a PCR" evaluation and approval chain may be followed at anytime.

EDH

AP 1001

Figure 1001 - 5

Three Mile Island Nuclear Station
Temporary Change Notice (TCN)

SIDE 1

NOTE Instructions and guidelines in AP 1001 must be followed when completing this form.

TCN NO. 2 77 (From TCN Log)

Unit No. 2

Date 3/16/79

1 Procedure 2301-3A1 (No) RCS Inventory (Title)

2. Change (Include page numbers, paragraph numbers, and exact wording of change.)

see attached.

3. Reason for Change:

To more accurately account for RCS leakage collected in the drain tank.

4 Recommended by JE Marck 3/16/79 (Date) 5. JE Marck (Supervisor's Signature) 3/16/79 (Date)

6 Duration of TCN - No longer than ninety days from effective date of TCN or as in (a) or (b) below whichever occurs first.

(a) TCN will be cancelled by a procedure revision issued as a result of a Procedure Change Request to be submitted by MORCK (Supervisor Submitting TCN) (Submit PCR as soon as possible) ☒

(b) TCN is not valid after _____ (fill in circumstances which will result in TCN being cancelled) ☐

7. (a) Is the procedure on the Nuclear Safety Related Procedure List? (Sec. AP 1001 – Appendix B) If "Yes", complete Nuclear Safety Evaluation. (Side 2 of this Form) Yes ☒ No ☐

(b) Is the procedure on the Environmental Impact Procedure List? (Sec. AP 1001 – Appendix B) If "Yes", complete Environmental Evaluation. (Side 2 of this Form) Yes ☐ No ☒

(c) Does the change effect the intent of the original procedure? Yes ☒ No ☐

NOTE: If all answers are "no" the change may be approved by the Shift Supervisor. If question (c) is answered "yes", the change must be reviewed by the PORC and approval by the Station/Unit Superintendent prior to implementation. If the answer to question (c) is "no" the change may be approved by two members of the plant management staff at least one of whom holds a senior reactor operators license on the unit affected in accordance with paragraph 3.6.4.2 of AP 1001.

8. Review and Approval

Block (c) "yes"

Approved _____ (Shift Supervisor/Foreman) 3/16/79 (Date)

Reviewed JE Marck 3/16/79

Members Of PORC _____ 3/16/79

_____ 3/16/79

Contacted _____ (PORC Members) 3/16/79 (Date)

Approved _____ (Unit Superintendent) _____ (Date)

Block (c) "no"

Approved _____ (SRO License) _____ (Date)

_____ (Member Plant Mng. Staff) _____ (Date)

Reviewed _____ (Chairman of PORC) _____ (Date)

Approved _____ (Unit Superintendent) _____ (Date)

NOTE The block (c) "Yes" review and approval chain may be followed at anytime.

9 Approval

Manager, Generation Quality Assurance _____ Date _____

NOTE M.G.Q.A. approval required only on certain Administrative Procedures listed in Enclosure 1 of AP 1001

10. TCN is Cancelled _____ (Shift Supervisor/Shift Foreman) _____ (Date)

TMI-56 Rev 8

EDT

1-Attachment 1H

Note: This attachment is not valid if operator caused RCDT level changes occurred

RCDT temperature (from computer pt 1032) 1

(B) Calculate density ($\frac{lb}{ft^3}$) of water in RCDT. Use line A, an assumed pressure of 15 psia, and the Table 1. Interpolate

	0 psia	500 psia
50°F	.016024	.015198
100°F	.016130	.016106

(Density $\left[\frac{lb}{ft^3}\right] = \frac{1}{v}\left[\frac{ft^3}{lb_m}\right]$.) Density = 62.1

(C) Calculate density of RC. Use average Tave and Figure 1.

Density = 44.57

(D) Convert identified leak rate, collected in RC drain tank, to equivalent RC gallons.

Ident Leak Rate (from print out) 4.1939 × (Density of RCDT line B 62.1 / Density of RCS line C 44.57)

RC equivalent Identified Leak Rate = 5.8294 gpm

(E) Subtract Equivalent Identified Leak Rate from Total Leak Rate to get Unidentified.

EOA

Attachment 1A ... cont.

Total Leak Rate 6.659 gpm 3.993

− Equivalent Leak Rate 5.544 gpm 2.813

= Unidentified Leak Rate .1225 gpm. 1.116

Accept Criteria

Total Leak Rate must be < 30 gpm.

Total Identified Leak Rate must be < 10 gpm.

Net Unidentified Leak Rate must be < 1 gpm.

EOH

JOE CONGDON

✓ 1. DID KNOW H_2 ADDITION WOULD EFFECT LR

✓ 2. TW ONLY IF COULD LOGICALLY INVALIDATE RESULTS

✓ 3. WAS NOT FORCED NOR DID EVER PURPOSELY FALSIFY LR RESULTS.

✓ 4. SF WOULD NOT TW RECORDS, TO WATCH FOR ADVERSE TREND, UNTIL GOT GOOD LR; THEN WOULD TW BAD RECORDS.

✓ 5. NOT HIS HAND-WRITING ON CHART

✓ 6. DID ADD H_2 TO EFFECT LR

✓ 7. COMPANY HAD FAILED TO RESPOND TO QP CONCERN TO FIX PROGRAM SO COULD CALCULATE LR PROPERLY AND QP WOULD NOT HAVE TO GO THROUGH THESE GYRATIONS.

BILL FEZS
CHUCK ADAMS
[illegible]

✓ 8.

On April 10, 1980, Joseph Raymond Congdon, Control Room Operator, Unit 2, Three Mile Island Nuclear Power Facility was interviewed at the Three Mile Island site concerning his knowledge of "leak rate tests" pertaining to the reactor coolant system inventory surveillance test. The interview was conducted by Tim Martin, Office of Inspection and Enforcement, Region I, NRC; James J. Cummings and John Sinclair, Office of Inspector and Auditor, Headquarters, NRC. Also present during the interview was Mr. John Wilson, Corporate Attorney, General Public Utilities, attending with the approval of Mr.Congdon. Congdon began by explaining that he would not agree that the addition of hydrogen to the make-up tank (MUT) would effect the leak rate test results, but he was aware that the addition of hydrogen did effect the level of the make-up tank. He added that the addition of hydrogen to the MUT was not something that one "would necessarily want to do." In contradiction to the above, Congdon stated that the MUT level was one of the critical parameters in the leak rate calculations and if hydrogen was added during the test it would have an effect on the leak rate. Congdon said that although he could not recall specific conversations with other operators or supervisors, on the subject of the effect of hydrogen addition, he believed that both Mr. Cooper and Mr. Adams had the "depth of knowledge" to know that hydrogen would have an effect.

When questioned about the discarding of leak rate test data which did not meet the technical specifications Congdon replied that it was "common practice to throw away bad leak rate tests" (i.e. test results which did not meet technical specifications). Congdon explained that procedurally he would show the test results to the shift foreman if they were acceptable. He continued by explaining that if he (Congdon) believed he had made a procedural error, or there was a logical reason for invalidating the results, he would personally make the decision to throw the test results away and rerun the test. Congdon stated, however, that he never threw one away that was done properly, and did not recall if he had run any tests, excluding mistakes, that were not acceptable.

According to Congdon his shift ran the tests at least once a shift to comply with the 72 hour requirement. Congdon stated that he did not recall how many tests were run per shift and then conceded that there may have been as many as two or three tests conducted per shift. After additional queries, Congdon also stated that there may have been one entire shift completed where operators did not get an acceptable leak rate. In response to a question about whether there was a policy or established practice to discard bad leak rates Congdon replied that the only requirement was that they "were required to take a test every 72 hours".

Congdon continued by stating that if there was a situation where they got two "bad" (unacceptable) tests then someone would have had to go and identify the problem. In the event that an "Action Statement" was required, Congdon stated that initiation of Action Statements "was not on his shoulders". Congdon added that he believed that "we had discussions about the leak rate and it was an area getting proper attention".

Congdon replied to a question about difficulty in obtaining acceptable leak rates, as time progressed toward the accident date (March 28, 1979), by stating that they had a lot of leakages in the drain tank but did not recall any specific problems with leak rate tests. Congdon then stated that there was pressure as "we got into a position that you had to go into an Action Statement" "company knows you have to shut down so general feeling was do what was necessary" within interpretations. Congdon stated that generally, "yes there was pressure to obtain a "good" leak rate". The supervisors would say "we need a good leak rate, we're approaching 72 hours". The pressure was to keep running the tests as often as necessary until you got a good leak rate test. Congdon did state, however, that nobody directed him to falsify records.

Following questions about whether he (Congdon) either intentionally altered leak rates or was instructed to falsify leak rate tests, Congdon stated that he never intentionally altered a leak rate test or received directions to falsify leak rate tests. Congdon stated that when a leak rate test was conducted properly and still exceeded limits it would be kept to watch for adverse trends until they got a good one and then the old test was discarded. Congdon also stated that he believed that in instances where leak rates appeared to be procedurally correct, but were still outside the limits (technical specifications) the results were forwarded to supervisors.

Congdon was shown leak rate test records for the dates November 5, 1978, November 9, 1978, and February 15, 1979, containing information implying hydrogen was added during a leak rate test conducted on Congdon's shift ("C" shift). Congdon observed the stipulated documents and confirmed that they disclosed the addition of hydrogen during the test procedures. Congdon then replied to a question regarding what effect the addition of hydrogen would have on the leak rate test by stating "it would look like less leakage".

In addition, Congdon was provided the opportunity to review a Makeup Tank Level Chart for the leak rate test on February 15, 1979. Specifically, he was questioned on a notation on the chart "Pressurized MUT" during the period of the leak rate test. He stated it was not his handwriting and he didn't recognize it.

Congdon was apprised that a record review of leak rate tests for the period of April 1978 through March 1979 disclosed that hydrogen was added during the performance of 8 tests, 7 were attributed to "C" shift. Congdon responded that he had no explanation of why the majority of these tests identified his shift. When asked if it was the intent to alter leak rate tests Congdon stated that he did not know what his intent was, however, he was not trying to cover up unsafe conditions or cover up leakage. Congdon, added, he probably was attempting to "get a good leak rate". Congdon reiterated that it "was not done to hide a safety issue but was done to comply with administrative requirements. According to Congdon the addition of hydrogen "probably was to satisfy the surveillance requirement and not jeopardize the safety of the plant". He then stated that he would not have done it if it was to jeopardize the safety of the plant.

Congdon subsequently admitted that hydrogen was added for the purpose of effecting the leak rate calculation. According to Congdon the entire shift, himself, Cooper, and Adams (shift foreman) knew the hydrogen effected the leak rate and that it was his belief it was a group decision to satisfy surveillance requirements. Congdon then stated that there was no intention to falsify records.

One reason that hydrogen additions were utilized, according to Congdon, was that the operators did not have faith in the leak rate test program. As Congdon continued he explained that they did not believe that they should be going through problems to satisfy a surveillance. Congdon further explained that the nature of the problems were brought up to supervisors, but CRO's were not getting information or responses to correct the problem. As Congdon recalls the problem was brought to the attention of Bill Fells in Programming, Brian Mehler, Shift Supervisor and Chuck Adams, Shift Foreman. The extent that each individual was informed of the leak rate problem, Congdon could not be certain. Congdon explained that a possible program deficiency was brought to Fells' attention but he could not say if Fell was aware that hydrogen additions were made to attempt to obtain acceptable leak rates.

Congdon concluded by stating that he had no personal knowledge of water being added to the make up tank during test procedures.

T. T. Martin 4/29/80

T. T. Martin

J. J. Cummings

J. R. Sinclair

JOHN BLESSING

O'D. Cummings

- TW policy came from many (2 forman talking over bad word laying out)
- Did all He in attempt to get good LR
- 9R/10 did not work — didn't want record laying out where NRC would see it and would ask why not 5/10
- was not forbidden practice
- common knowledge of CRO & SF
- bad LR disregarded based on crappy listing
  - FRS Boss
  - SHIFT Foreman
  - OIC
- Computer program errors make it more difficult with time to get acceptable LR
- Can not remember time Hope Cal. calc didn't get an acceptable one
- Another shift CRO (unnamed) did add He
- Pressure - a sense of duty to keep plant on line
- Key LR was error

RKC
0810
4-10-80

JOHN BLOSSING CRO B-SHIFT
advise attorney can be in room
People Present
CUMMINGS MARTIN
CHRIS GLASSDIBBINS ATTORNEY

FALSIFICATION OF LEAK RATES

(1) doesn't know of falsification of records

(2) By additives - knew some people did.

Techniques for falsifying.

(1) adding water

(2) By - falsification should not be done by

(3)

THROWING AWAY BAD leak rates

(A) yes

(B) Always threw away any bad leak rates

(C) Knows of an instance when a leak rate was left out - and its subsequent came down to throw away leak rate

"would come down to throw away bad leak rates. - Quality management

BLESSING.

leak rate throwaways - something
cleaned on shift. feels
everyone complained about ~~took tank~~
the throwaways.

Blessing states he has added H_2 to
makeup tanks - says eddy. H_2
was something he would try to do
to get good leak rates.

Picked up the suggestion to add
H_2 from other operators,

- says it was no secret
that H_2 was being added to the
makeup tank - it was a common
practice. it was not a secret
he assumes the supervisors knew
about it.

9 out of 10 times eddy H_2 did not
work.

Knowledge was at least at Foreman
level - DICK HOYT - feels everyone on the list
of Foremen should know - He was positive
all of these men knew - It wasn't a secret
SHIFT SUPERVISORS - doesn't know if they knew
about the practice / possible that
the level may not know about it

B&W 55/HC

72 hr window - what was his understanding of tech Specs.

Set was on S.O.P

- felt the computer was inaccurate because the samp pump would not come on so that could be that mechanistic

also handed hand calculations and got better ones. He and Hal did go to on few leak rate calculations

Management S.O.P. would not to expand Tech Spec C18 Pull)

APPROACH TO ACCIDENT - more difficulty to get leak rate - increasing pressure to get good leak rate.

- Blessing

Felt computer was not picking up increased leakage in the valve leading to the RC drain tank.

leak rate test would fail 4-5 times per shift on an average - had one reactor thrown away.

Reason for - throw away. Bro had one reactor would 't buy want for use to sell them and maybe get shut down and heads

Blessey
they were not needed anyway,
feels - Booher and Barton both
added H_2 as a last resort
Blessey has personal knowledge that
~~Booher~~ Barton put H_2 in the tank.
can't say if Booher did or not

Pressure to get rate

-1. envy of day. not direct
management pressure
2 feels addy H_2 is not policy
because it doesn't work
3 did addy H_2 suspected
concentration it would be
used

---

4 H_2O ADDITION would not
knowingly add water
without fully complete
But could happen - guy could forget
to add it.
The man doing the leak rate
is responsible for adding
water additions to the computer.
LOG ENTRIES on 2-2-79 - Ray Booher
made the log entry - says he felt

He didn't know of. Key added to
water to the ~~bo~~ tank
normally -. You would tell the
panel operator not to add
water when the leak rate
was zero
- Water addition was not common
knowledge.
1-13-79. H₂O additions
says Hartman never talked to him
about pressure Problems
feels the happened because of
operator error.
Common Practice was to add
~~water~~ water to ~~bo~~ makeup tank
Prior to test - because you didn't
want to add water during the
test
seven statements.
Break at 0915 Galanger meeting
at 0945 - declined to give a statement

REPORT OF INTERVIEW WITH JOHN BLESSING
AS RECORDED BY R. KEITH CHRISTOPHER, INVESTIGATOR
U.S. NUCLEAR REGULATORY COMMISSION

On 4/10/80, Mr. John Blessing, a Control Room Operator with the Metropolitan Edison Company was interviewed commencing at 0810. The interview was conducted at the Nuclear Regulatory Commission Office at the Three Mile Island Nuclear Power Station by Keith Christopher and Thomas T. Martin from NRC Region I and Mr. James J. Cummings, of the Office of Inspector and Auditor, NRC Headquarters. Also present was a representative for Metropolitan Edison Company, Attorney at Law, Harry Glasspiegel. When asked if the aforementioned Attorney was present at his request, Mr. Blessing indicated the presence of Mr. Glasspiegel was desired.

Blessing was questioned regarding the falsification of leak rate records in the Reactor Coolant Inventory Surveillance Test for TMI #2. Blessing denied knowing of any specific instances in which the leak rate records were intentionally falsified. He acknowledged that it was common practice by a large portion of the control room operators to add hydrogen to the makeup tank while running the leak rate surveillance test in order to assist in getting good leak rate results (i.e. results that met technical specification requirements). At this time, Blessing did not specifically identify individuals who had actually added hydrogen to the makeup tank, but reiterated that it was common practice and well known to personnel at least up to the shift foreman level of management. Blessing was also asked to relate ways that he was personally aware of for falsifying leak rate test results. He responded by stating that in addition to adding hydrogen, an operator could add water to the makeup tank without telling the computer. This addition would result in an incorrect computer calculation showing less leakage in the reactor coolant inventory which could cause the leak rate to fall within the technical specification requirements. Blessing said he was not aware of any instance where water was intentionally added to the makeup tank without telling the computer for purposes of falsifying leak rate test results. He continued with the statement that he did not feel the addition of hydrogen was a falsification of the leak rate records because it "didn't do anything to the makeup tank level." He did acknowledge that on numerous occasions he had in fact added hydrogen to the makeup tank while running the leak rate surveillance test. He indicated this was because other operators, who he said he could not identify, had told him that adding hydrogen would affect the leak rate test calculations. He emphasized that on 9 out of 10 occasions the addition of hydrogen to the makeup tank did not work and there was no management indication that it was a forbidden practice to add hydrogen to the makeup tank while the reactor coolant inventory surveillance test was being run.

The second area of questioning concerned the destruction of the reactor coolant inventory surveillance test records that failed to meet the technical specification requirements of 1 gallon per minute (GPM) for unidentified leakage. During questioning, Blessing acknowledge that he routinely destroyed leak rate test records which were "bad" (i.e. did not meet technical specification requirements) and acknowledged this was a common practice among the control room operators. Blessing was asked if he was directed to destroy the bad leak rate calculations and he responsed by stating that the practice of throwing away of bad leak rate test calculations was "filtered down from the management people by shift foremen." Blessing said he was unable to specifically identify any one foreman or supervisor who told him to destroy the bad leak rate calculations, and reiterated that it was more or less passed down through the ranks. He cited what he thought was the origination of this policy when on one occasion (date unknown) a bad leak rate calculation was left lying out in the control room. Blessing said shortly after that incident he overheard two foremen (whom he could not/would not identify) talking in the control room. He said, to the best of his recollection, he heard them say that they (the foremen) didn't want the bad leak rate records laying out where the NRC could see them and then ask why they (the plant) were not shutdown. He again stated that he could not specifically identify any one particular management individual who directed him to throw away the leak rate test calculations, stating that it was just something he learned on the shift.

At this time, Blessing was questioned regarding the addition of hydrogen to the makeup tank in order to get good leak rate results for the surveillance test. He again stated that he has in the past added hydrogen to the makeup tank and stated that adding this was something he would do as a last resort to get a good leak rate. He again stated he picked up this suggestion to add hydrogen from other operators but could not specify any particular individual. He indicated that he knew at least one other operator, name forgotten, who added hydrogen during a leak rate test. He emphasized that it was no secret that hydrogen was being added to the makeup tank during the running of the reactor coolant surveillance test and it was a totally common practice. He said it was his opinion supervisors and foremen were well aware of this practice. He again reiterated that 9 out of 10 times the hydrogen addition did not work and therefore was not pertinent to this issue. When specifically asked what foreman were aware of the hydrogen additions, he stated he was confident that Dick Hoyt, his Shift Foreman was well aware of the hydrogen addition during the leak rate test. When asked about the other shift foreman and supervisors in the plant he stated it was his opinion, that because it was such common knowledge, all of the foremen should have known about the practice. In referring to an operations department personnel roster he identified F. Scheiman, W. T. Conaway, C. D. Adams, A. W. Miller and C. L. Guthrie who are the Unit 2 Shift Foremen. Blessing did not provide any supportive information as a basis for this assertion.

Blessing was then questioned about his understanding of the technical specifications that gave him 3 days (72 hours) in which to get a good leak rate calculation for the reactor coolant inventory surveillance test. He stated that it was his understanding that he only had to have a good leak rate result once every 72 hours, irregardless of the fact that he might get subsequent unexplained "bad ones" during the period before getting the next satisfactory leak rate result. He said the bad leak rate calculations were largely disregarded because he and the other operators felt the computer was not accurate. He said, particularly in the latter stages, just prior to the accident, it became harder and harder to get good leak rates, because the computer program errors made it difficult to get acceptable leak rates. Blessing said these computer problems were relayed to Mr. Fells for correction, but no immediate corrective action was taken. He also stated that he felt that the computer program was wrong because the computer would show a large amount of leakage in the reactor coolant inventory and yet the sump pump which collects the leakage from the various reactor coolant system mechanisms would not come on, so that it was his opinion that there was no way that much water could be leaking from the reactor coolant system. He said these were the primary reasons why they, as operators, disregarded the bad leak rate data. He also stated that along with the computer calculated leak rates, he did many hand calculations and that he got "better ones" than the computer. He also stated that he and Hal Hartman had made quite a few of these hand calculated leak rates. He stated he could not remember a time when the hand calculation was not a good one. He continued that as the approach to the accident drew nearer it was more difficult to get good leak rates and there was increasing pressure to get them (good leak rates), although he did not specify management personnel areas or ways pressure was exerted. He said he felt the computer was not picking up the increased leakage in the valves leading to the reactor coolant drain tank and for this reason it was causing bad calculations. He said it was also his opinion that leak rate tests would fail on an average of 4 to 5 times per shift and that all of those results would have to be thrown away.

Blessing also related at this time that it was his personal knowledge that Hal Hartman had in fact added hydrogen to the makeup tanks to get good leak rates during the reactor coolant inventory surveillance test. When questioned regarding the other operator on his shift, Ray Booher, he stated that he could not say for a fact whether or not Booher had in fact added hydrogen or water or in any other way falsified the leak rate.

Blessing was then questioned regarding management pressure that was being exerted in order to get good leak rates. He stated that he did not feel there was any direct upper management pressure but there was a strong desire to keep the plant on the line and that no one wanted to be the shift responsible for the plant coming down. He indicated the pressure resulted from his personal since of duty to keep the plant on the line. Again he stated that he did not feel the addition of hydrogen was a falsification of

leak rates because it did not work most of the time. At this time he acknowledged that adding water to the tank would be a falsification, but stated that he would not normally add water without telling the computer. He did indicate that this could happen for several reasons; for (1), the operator would just forget to add it to the computer. He also explained that the operator doing the leak rate test was not responsible for inputting any water additions to the reactor and that in the dialogue between the two, it very well could happen that the operator running the computer program did not know the water was added. At this time Mr. Martin showed John Blessing a leak rate calculation for 2-2-79, which reflected that during the period of time of the leak rate test, water was added to the makeup tank. It was noted by Blessing that the log entry was made by Ray Bocher. He also acknowledged that he had in fact signed the computer calculations for the leak rate tests. He denied intentionally adding water to the makeup tank without telling the computer in order to get a good leak rate. He stated that he probably did not know that Ray Booher had added water and for that reason he punched zero (0) into the computer calculation for operator induced change. He said that normally he would tell the panel operator not to add water when the leak rate test would be run, but then on some occasions it would be forgotten. He said in all probability it was his own error that resulted in water being added without the computer being told. He again denied that he intentionally neglected to record the water addition in order to falsify the leak rate calculations. At this time Blessing was shown another leak rate calculation dated 1/13/79, which also indicated an addition of water during the leak rate test. He again stated that his only explanation for the water addition without telling the computer was operator error. He concluded by denying the he intentionally falsified any leak rate calculations by the addition of water or by any other means. Blessing was then asked to provide a sworn statement regarding the details of this interview; however, Blessing declined to provide a sworn statement and the interview was terminated at 0945.

R. K. Christopher

T. T. Martin

MARTY COOPER

✓ 1. SF & SS TOLD TO TW, CAN'T REMEMBER SPECIFIC INSTANCE

2. H_L ADDITION WILL EFFECT RESULTS OF LR INCONSISTENTLY (DISCUSSED BY OP)

✓ 3. LOGAN DIRECTION TO OP NOT TO MAINTAIN WITHIN A BAND.

✓ 4. ADDED H_L TO KEEP WITHIN BAND, NOT TO EFFECT LR

✓ 5. ~~FOREMAN~~ ADAMS DID HAVE KNOWLEDGE OF INCONSISTENT EFFECT, SINCE PART OF DISCUSSION.

REPORT OF INTERVIEW OF MARTY VINCENT COOPER
AS RECORDED BY JOHN R. SINCLAIR, INVESTIGATOR
U.S. NUCLEAR REGULATORY COMMISSION

On April 10, 1980, Marty Vincent Cooper, Control Room Operator, Unit 2, Three Mile Island nuclear power facility, was interviewed at the Three Mile Island site by NRC personnel regarding his knowledge of "leak rate tests" as they related to the reactor coolant system surveillance test. The interview was conducted by Tim Martin, Office of Inspection and Enforcement, Region I, NRC; James J. Cummings and John Sinclair, Office of Inspector and Auditor, Headquarters, NRC. Also present during the interview was Mr. John Wilson, Corporate Attorney, General Public Utilities, attending with the approval of Mr. Cooper. Cooper stated that he had personal knowledge that leak rate tests which were considered unacceptable or bad (i.e. indicated a leak rate greater than technical specifications) were routinely thrown away. Cooper explained that the discarding of bad test data was a "common practice" and does not recall ever receiving instructions from his immediate supervisors, or others in management, to retain these tests. Cooper also explained that he did not know how the practice started. According to Cooper, there were occasions when he informed his shift foreman, Chuck Adams, or his shift supervisor, Brian Mehler, of unacceptable leak rate test results.

During the same period, Cooper stated that some of the leak rate tests were "not off by much" but the practice would be to do it again (rerun the test) until they got a "good" leak rate. Cooper continued by explaining that obtaining "acceptable" leak rates was "not consistent" and sometimes the control room operators (CRO) would run whole shifts without getting an acceptable leak rate and then, on another shift they might get an acceptable leak rate on their first test.

When queried as to whether unacceptable leak rates had ever been provided to the shift foreman, Cooper replied "yes" and stated that he (Adams) threw it away. Cooper added that he also told the shift supervisor on one occasion that they had run a test and obtained an unacceptable leak rate at which time the supervisor (Mehler) had told him to throw it away. Cooper also stated that the "plant parameters did not change enough" to lead him to believe that the plant had a leakage problem.

Cooper explained that he did not perceive any pressure to get a "good leak rate" and stated that there was nothing that they could do to make him get a good leak rate.

Cooper was provided a copy of test documents dated November 9, 1978, and questioned about an addition of hydrogen during a leak rate test. Cooper stated that he was aware that adding hydrogen had an "inconsistent effect on the leak rate" and in some instances seemed to effect the leak rate and provide acceptable data. When questioned as to why hydrogen would be added duirng a test if they believed it might effect the calculations, Cooper responded because "we needed hydrogen". Cooper stated that he did not know of anyone adding hydrogen to effect the leak rate and denied adding hydrogen to intentionally effect the leak rate.

One reason that hydrogen was added to the system, according to Cooper, was that the Unit Superintendent, Joe Logan, issued instructions that the hydrogen must be "maintained within a band". Cooper was provided copies of seven leak rate test records which indicated that hydrogen had been added during the leak rate test. Cooper explained that he had already stated that they were aware that "it did have an effect" on the leak rate, but that was not the purpose of the hydrogen additions. When questioned as to why other shifts did not appear to require the addition of hydrogen during tests, Cooper responded that he did not know why the other shifts did not have to do those things. This was stated to reiterate that hydrogen had to be continually added to remain "within the bands". Cooper repeated that they did not make additions with intent to effect the leak rate.

Cooper later explained that there had been operator discussions, about unacceptable leak rates and the effects of hydrogen additions on leak rate calculations, which included Chuck Adams.

Concerning knowledge of the addition of water to the make up tank, without entering the data in the computer, Cooper advised that he had no knowledge of that ever being done. Cooper concluded by stating that his shift never "got close" to the 72 hour limit when running the leak rate test.

T. T. Martin 4/29/80

T. T. Martin

J. J. Cummings 4/23/80

J. J. Cummings

J. R. Sinclair 23 APR 80

J. R. Sinclair

REPORT OF INTERVIEW WITH RAYMOND BOOHER
AS RECORDED BY R. KEITH CHRISTOPHER, INVESTIGATOR
U.S. NUCLEAR REGULATORY COMMISSION

On 4/10/80 Mr. Raymond Booher, a control room operator for the Metropolitan Edison Company was interviewed commencing at 0715. The interview was conducted at the Nuclear Regulatory Commission office at the Three Mile Island Nuclear Power Station by R. Keith Christopher and Thomas T. Martin from NRC Region I and Mr. James Cummings of the Office of Inspector and Auditor, NRC Headquarters. Also present at the request of Booher was Mr. John Cody, his union representative from the International Brotherhood of Electrical Workers and Mr. Harry Glasspiegel an attorney representing Metropolitan Edison Company. When interviewed Booher related essentially the following information.

Booher was asked to relate any information he had regarding an allegation made by Harold Hartman in that during a Unit 2 startup the reactor went critical below the allowable band around the calculated "estimated critical position" (ECP), the reactor was not shutdown as required by procedure for the event and that a new ECP was fudged. Booher acknowledged that he worked the same shift with Harold Hartman and recalled that on several occasions he worked on a shift in which Brian Mehler was the shift supervisor. Booher stated that he could not remember the incident in question and did not recall being asked to recalculate an ECP after the startup. He stated that he was never instructed by any supervisor to fudge an ECP calculation. He also noted that Harold Hartman and Mehler had a personality conflict that impaired their ability to work on the same shift. In conclusion, Booher said he was unable to confirm or deny that this incident had taken place.

Booher was then questioned with regard to the REACTOR COOLANT INVENTORY SURVEILLANCE TESTS and he confirmed that there had been problems in getting good leak rate results (i.e. results that met Technical Specification requirements). He indicated that on some days they would get good leak rate results right away while on other days they (the operators) could not get an acceptable one. Booher was asked how leak rates could be falsified. He indicated that the test could very easily be fudged. Booher said the operators used to take a number off the reactor coolant drain tank gauges, and all the operator had to do was enter a wrong reading. Booher said he had no personal knowledge of any individual doing this and denied he ever did it. He said since the inception of this investigation he had heard that the addition of hydrogen to the makeup tank during the surveillance test was a way of getting good leak rates. He said he wasn't aware of this fact until recently and that he did not understand how hydrogen addition could cause a rise in the makeup tank. Booher was then questioned regarding the disposition of leak rate test results which had failed. Booher stated that he was not sure and could not remember what the policy was and could not remember if he threw away bad leak rate tests or if they were kept.

Booher was then questioned as to his understanding of the Technical Specification requirements for the taking of leak rates in the Reactor Coolant Surveillance test. He said that it was his understanding that once they got an acceptable leak rate it was 72 hours before they needed to get another good one. He said it was his interpretation that if they had subsequent unacceptable leak rates, after a good one, it did not matter as long as it was within the 72 hour time period. He stated his interpretation was drawn from his observation of everyone else doing the same thing. This interpretation was never related specifically to him in training or by any supervisor. He did state that the Technical Specifications would normally be interpreted by the Shift Supervisor, who would have been Bernie Smith, had there been any questions. Booher said he could not recall this particular area being discussed by anyone. Mr. Cody, union representative, then requested a private meeting with Booher. They subsequently returned and the interviewed continued. At this time Booher reiterated that he did not remember what was done with a bad leak rate test record. When questioned regarding the getting of good leak rates, he said that supervisors, foreman, and other operators would, in general tell each other to get good leak rates, but that he did not feel that it was direct management pressure. He also stated that he did not remember any specific incident where either his supervisor Dick Hoyt or Bernie Smith specifically ordered him to get a leak rate at any cost. Booher said that the standing routine was that if you could not get a good leak rate, you kept running it hourly until you got one. At this time Mr. Martin showed a leak rate calculation dated 10/20/78, which according to the control room operator's log indicated hydrogen had been added to the makeup tank during the leak rate test. Booher was at a loss to explain the hydrogen addition, or its effect, and denied that he had any intention to falsify the records.

Booher was also shown a leak rate calculation dated 1/13/79 in which water was added to the makeup tank and not entered into the computer. Booher reviewed the leak rate calculation and the copy of the control room log sheet pertaining to this incident. He confirmed that it was his handwriting in the log recording the entry, but had no explanation for the water addition not being added to the computer. At this time, Booher again stated that it was not his intention that leak rates be falsified and that he felt no management pressure to do these type of things to get good leak rates. Booher acknowledged being a good friend of Harold Hartman and stated that he could not recall if Harold Hartman had ever asked him to specifically help him fudge leak rates. He specifically stated that he could neither confirm nor deny if Hartman ever asked him to fudge the leak rates by adding water. Booher was again shown another leak rate calculation dated 2/23/79 which reflected that water was again added to the makeup tank during the time of the leak rate test. Booher reviewed the leak rate record and the operator's log and confirmed that it was his handwriting entering the water into the system. Booher

continued to explain that on the panel he doesn't necessarily know if someone else is commencing a leak rate test during this time and he may not necessarily know that he should not add water if there was no dialogue between the operators. He denied intentionally falsifying the records and again stated that he was at a loss to explain how the water was added and not recorded except for operator error. He concluded by stating he had no feeling of pressure from management level to get good leak rates. He stated that everyone wanted to keep the plant on the line if possible. At this time Booher added nothing further to the interview and it was terminated at 0806.

R. K. Christopher 4/28/80
R. K. Christopher
Investigator

Thomas T. Martin 4/28/80
Thomas T. Martin

8:10 PM. - 9:1[illegible]

3-22-80

HAROLD HARTMAN -

(1) BCP STARTUP CRITICALITY - P. 4 C on branch
(A) lack spec requirement for BCP - doesn't recall any such spec requirements PROCEDURES ON BCP
(B) BCP has to be calculated for center Reed and + or minus 5 to reactivity with a period of time to ensure that reactor is doing what it is supposed to do. - Recorder is "APPROACH TO CRITICALITY" - recalls BCP was off in Boron concentration = thinks mode occurred NOV. 1978 instead of April May 78

2- (A) EMERGENCY FEEDWATER PUMP TEST P. 55 did manage to get them to judge results - no reference value change - who explain change - at A. it was explained but he doesn't recall who it was DIANE SAMMONS Tallgent and other guy - 151 inspectors - unaware of any other gripe documented the problem

A-19 page 2

3 LEAK RATES - P. 14

would leak rate calculation pursuant ~~to~~ to ~~Generic~~. ANSWER YES
- same corp. - . using makeup tank
instance where supervisor told him to
get a good leak rate
I open up makeup valve tank
says he actually cranks up computer
rads.

4 Valve - ISI EXEMPTIONS - P. ~~23~~ 29

5 LOSS OF 11. Reason injection Pumps
damage type problems - caused by
operator error by not opening suction valves

says he has no direct knowledge but
left the plant pursuant.
working beyond what is in the best
of the plant