

STATEMENT

I, MICHAEL J. ROSS, hereby make the following voluntary statement to PETER F. BACI who has identified himself to me as an Investigator with the U. S. Nuclear Regulatory Commission. I make this statement freely with no threats or promises of reward having been made to me. Investigator BACI is writing/typing this statement for me at my request.

This statement summarizes the information which is provided to Mr. Baci and to Mr. Ray Smith, another NRC investigator, on 9-18-81 and ~~9-19-81~~ 9/19/81 at the NRC Office at Three Mile Island. I am currently employed as the Manager of Plant Operations, TMI-1, by MHI-EI and am licensed as a senior reactor operator (SRO) by the NRC.

In a recent, arranged along with Sam Newton, the Operations Training Manager, a schedule of people to review the NRC RC/SRO license exams which were given during the period April 21-24, 1981. The purpose of the review was to ensure that the questions were clear and relevant to the TMI-1 plant and that the answers were formulated using up-to-date tech specs, etc. This review is standard procedure and is accomplished by senior independent reviewers and the NRC going over the questions together.

Personally I wrote down all the exams and answers myself. But the April 1981 exams were reviewed in that fashion, including myself, was being taken by both the RC (A) exam on 4/21/81 and the SRO (A) exam on 4/22/81. Since I took the exams on those days, Sam Newton, Ron Toine (Operations, Plant Director TMI-1) and Gibson PARD, a training consultant, reviewed those exams with the NRC reviewer Bruce W. LSCA. They reviewed

the RC(A) and SRC(A) tests only; this was because the NRC ^{didn't want to} ~~wasn't~~ going to go over the answers days until all of the exams of the same type were either completed or in progress. Thus, the answer keys for the RC ^{and SRC} exams were not reviewed until Thursday and Friday (4/23-24/81).

On those days, I met with WILSON, along with Denny BOLTZ and Nelson (Stacy) BROWN, both of whom were for training and had taken the RC/SRC exams with me on 4/21-22/81. On Thursday (4/23/81) we went over the exams and answer keys for the RC(A) and SRC(A) tests; I believe we started the RC(B), which was being taken that day, but did not finish that until Friday, 4/24/81, when we also did the SRC(B) test. The procedure was to go through the exams and answers on a question-by-question basis. We would suggest some changes because the tech specs had changed or the language in the manual was out of date. Whenever we felt something had to be changed, we had to have a consensus of basis for the change.

The changes we recommended were what I would consider minor for exams of this type. The changes, if they were made, were fairly helpful some of the examiners and I think it was a good thing if the changes we recommended were made with close supervision. I don't want to say any own ideas or anyone else's for that matter.

The visitors that about 4 hours on 4/23 and about 3 hours on 4/24/81. I remember that we broke for lunch on Thursday and came back

interesting; on Friday we finished our review before lunch. In my opinion, the reviews, individually, took about the same time as some but ones in the past. The total time spent on the reviews was longer because, as it said earlier, this was an unusual set of circumstances and it required exams and answers to be involved. With SEN the NRC project was with us in BELTZ office for almost all the time. BELTZ's office, where the reviews took place, was adjacent to the classroom in which the exam took place. At that place, of course, there was a window in his office through which he could see the classroom although it can not really see what is going on in the room. He had a pointed view through the glass and I cannot say if anyone was in the exam room when WILSON was with us, or simply don't know.

Mr. Brier noted me if I thought anyone might - i.e. "cheaters" could be used. He believed the only way cheating could occur is by collusion. Because, in my opinion, we cannot have enough information in the room with us - i.e. if the room was closed - to see the test if it didn't follow the materials. It is not possible to have any other way of cheating, even as "cheaters" at the time of our last test. Since we are not really the only thing people put into the exam room is the materials, the "cheaters" - person, paper, exam book, etc. are provided, either by the NRC or METS Training.

Mr. Brier also noted me if thought anyone involved in the review process had been involved.

protracted that process in order to keep the process away from the exam he was covering. I don't think that was the case. I don't recall any conversation in the shift supervisor's office in which I said that I had kept Wilson out of the exam room or that he had been out of the room for a long period of time. I might have discussed the answers and expanded answers with the shift supervisor although I can't remember a specific conversation. I am up in that office regularly and such a talk, if it did occur, would have been general conversation.

9/19/81 MJC

On 9/19/81, Mr. Bess advised me that an allegation had been received that I had stated that I had kept Wilson out of the exam room and kept the process out of the exam room for a long time. I don't recall any conversation of this nature, which supposedly took place in the shift supervisor's office on 4/23 & 24/81. However, if it did occur in the answers in the length of time the exam took place, anyone who overheard me and in view of the above misinterpreted me or took my statement out of context. I did not then, nor have I ever, attempted to remove NRC process from Wilson's file, further any changes in Wilson's file may have resulted from the review were made by the NRC.

I have read the foregoing statement consisting of 4 handwritten/~~typed~~ pages. I have made and initialed any necessary corrections and have signed my name in ink in the margin of each page. This statement is the truth to the best of my knowledge and belief. I declare under penalty of perjury that the foregoing is true and correct. Executed on 9/19/81 at 1142.
date time

INTERVIEWEE:

NAME:

Michael J. Rose

Subscribed and sworn to before me this 19th day of Sept, 1981
at Three Mile Island.

INVESTIGATOR:

NAME:

Peter E. Ryan

11:43

WITNESS:

NAME:

Raymond H. Smith

NRC Investigator 11:43

ENCLOSURE 6

Sworn Statement by
1981.

at Three Mile Island on September ~~28~~²²,
~~28~~²².

I, _____, hereby make the following voluntary statement to Mr. R. A. Matakas who has identified himself to me as an investigator with the Nuclear Regulatory Commission. I make this statement with no threats or promises having been made.

I am currently employed at Three Mile Island, Unit 1, as a Shift Technical Advisor (STA). I have been employed by Med Ed since December 1976. As a STA, I spend most of my time in the control room, shift supervisor's office or on tours of the plant.

I did not take either the reactor operator or senior reactor operator tests that were administered by the NRC at TMI on April 21 through 24, 1981. I was probably off Tuesday, April 21, 1981, however, I did work the 7:00 AM to 3:00 PM shift on April 22-24, 1981. I believe that it was sometime after the testing was over that I learned that Mr. Mike Ross had reviewed the RO and SRO tests and keys. On one occasion, around the time period of testing, I was in the shift supervisor's office and Mr. Ross commented about reviewing the tests and answer keys. There were other people present but I do not recall who. It was more of a general comment to the effect that he (Mr. Ross) had reviewed the tests and keys so that they were more correct and he indicated that the review resulted in a broadening of some of the answers so that they were more fair. The impression that I got for example, was that if originally the answer key allowed for just one correct answer when in fact more than one answer was both fair and correct then the key was broadened to include all the correct answers. I did not infer from this comment that he had intentionally attempted to broaden the answer key so as to give an un-

fair advantage to the people taking the test. Nor did I get the impression that he had attempted to intentionally keep the proctor out of the testing room under the pretext of reviewing the test. My impression was that Mr. Ross made the statement in a reassuring manner, more-or-less directing his comments at those present who had taken the test, that the tests and answer keys had been reviewed for fairness. Furthermore, I have not heard any conversation by any Med Ed/GPU person that would indicate that the proctors had been intentionally kept from the testing rooms.

I have read over this two page statement and discussed its contents with Mr. Matakas who had it typed for me. I have acknowledged its contents with my initials, have had the opportunity to make corrections and this statement is the truth to the best of my knowledge and belief.

Signed: _____

Date/Time: 10/2/01 10.57 A.M.

SUBSCRIBED AND SWORN TO BEFORE ME

THIS 2ND DAY OF OCT 01

AT T M I, D A.

Richard Matakas
INVESTIGATION SPECIALIST, USNRC

ENCLOSURE 7

SWORN STATEMENT BY

AT THREE MILE ISLAND ON SEP. 23, 1981.

I, _____, HEREBY MAKE THE FOLLOWING VOLUNTARY STATEMENT TO MR. R. A. YATAKAS WHO HAS IDENTIFIED HIMSELF TO ME AS AN INVESTIGATOR WITH THE NUCLEAR REGULATORY COMMISSION. I MAKE THIS STATEMENT WITH NO THREATS OR PROMISES HAVING BEEN MADE.

I AM CURRENTLY EMPLOYED AT THREE MILE ISLAND, UNIT 1, AS A SHIFT TECHNICAL ADVISOR (STA). I HAVE BEEN EMPLOYED BY MED ED SINCE JUNE OF 1977. AS A STA, I SPEND MOST OF MY TIME IN THE CONTROL ROOM, SHIFT SUPERVISOR'S OFFICE OR ON TOURS OF THE PLANT.

I DID NOT TAKE EITHER THE REACTOR OPERATOR OR SENIOR REACTOR OPERATOR TESTS THAT WERE ADMINISTERED BY THE NRC AT TMI ON APRIL 21 THROUGH 24, 1981. I WORKED ON ~~TUESDAY~~ ^{MONDAY} APRIL 20, 1981, ~~HAD WEDNESDAY OFF~~ ^{TUESDAY AND} AND THEN WORKED THE 3:00 PM TO 11:00 PM SHIFT ON THURSDAY, FRIDAY, SATURDAY AND SUNDAY, APRIL 23-26. AT NO TIME

DO I RECALL BEING A PART OF OR OVERHEARING ANY CONVERSATION BY MR. MIKE ROSS RELATING TO A REVIEW OF THE TESTS ADMINISTERED BY THE NRC AROUND THE TIME OF THE EXAMINATIONS, I DID HEAR COMMENTS (CAN NOT RECALL EXACT) THAT THE PROCTORS WERE ABSENT FROM THE EXAM ROOM FOR LONG PERIODS OF TIME BUT I DID NOT HEAR THAT THEY WERE INTENTIONALLY KEPT FROM THE ROOM OR THEY WERE KEPT FROM THE ROOM BY SOME DEVISIOUS MEANS. I FURTHER DID NOT HEAR ANY COMMENTS OR DISCUSSION RELATING TO A TEST REVIEWER, OR ANYONE ELSE, ATTEMPTING TO GET THE NRC TO EXPAND THE ANSWERS TO THE TESTS SO AS TO GIVE UNFAIR ADVANTAGE TO ANY ONE TAKING THE TESTS. AT NO TIME HAS ANYONE TOLD ME THAT THEY CHEATED ON THE NRC TESTS NOR HAS ANYONE PROVIDED ME WITH THE NAME OF ANY INDIVIDUAL WHO MAY HAVE CHEATED, SINCE THE TESTS WERE FIRST GIVEN ON APRIL 21, 1981, I HAVE HEARD ONE RUMOR THAT MAY OR MAY NOT BE RELATED TO CHEATING ON THE EXAMS. WHILE IN THE AREA OF THE CONTROL ROOM, AROUND TEST TIME OR SHORTLY THEREAFTER, I HEARD SEVERAL PEOPLE SITTING AROUND TALKING ABOUT THE TESTS AND TEST QUESTIONS. ONE OF THE INDIVIDUALS SAID SOMETHING TO THE EFFECT, THAT QUESTION WAS NOT ON MY SHEET. FROM THE CONTEXT OF THE CONVERSATION, I ~~THOUGHT~~ ^{OVERHEARD} I THINK THE INDIVIDUAL WAS REFERRING TO A "CRIB" SHEET AND NOT A HOME STUDY SHEET BUT I'M NOT REALLY SURE. AT THE TIME I DID NOT THINK

WHICH WOULD INDICATE THAT MR. ROSS DID ANYTHING IMPROPER.

WITH THE EXCEPTION OF THE TWO INDIVIDUALS IDENTIFIED BY THE NRC.

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CONTINUATION OF SWORN STATEMENT BY

ON SEP. 23-24, '81.

ANYTHING ABOUT THE COMMENT AND DO NOT KNOW IF THERE IS ANY SUBSTANCE TO IT OR NOT. BECAUSE IT WAS A PASSING COMMENT AND I HEARD IT ABOUT FIVE MONTHS AGO, I DO NOT RECALL WHO MADE THE COMMENT OR WHO ELSE OVERHEARD IT.

I HAVE READ OVER THIS TWO PAGE STATEMENT AND HAVE DISCUSSED ITS CONTENTS WITH MR. MATAKAS WHO TYPED IT FOR ME. I HAVE ACKNOWLEDGED ITS CONTENTS WITH MY INITIALS, HAVE HAD THE OPPORTUNITY TO CORRECT ERRORS AND MAKE ANY CHANGES AND THIS STATEMENT IS THE TRUTH TO THE BEST OF MY KNOWLEDGE AND BELIEF.

SIGNED:

DATE/TIME: 9/27/81 1114

SUBSCRIBED AND SWORN TO BEFORE ME THIS 24TH DAY OF SEPTEMBER 1981, AT THREE MILE ISLAND NUCLEAR POWER STATION.

Richard A. Matakas
RICHARD A. MATAKAS, INVESTIGATOR, USNRC

ENCLOSURE 8

TRANSCRIPT OF TAPED INTERVIEW WITH
UNIT 1, SHIFT TECHNICAL ADVISOR, CONDUCTED BY NRC REGION I INVESTIGATOR
RICHARD A. MATAKAS ON SEPTEMBER 23, 1981. THREE MILE ISLAND,

I, _____, HEREBY ACKNOWLEDGE THE CONTENTS OF THE FOLLOWING THIRTEEN
PAGE TRANSCRIPT AS AN ACCURATE AND TRUTHFUL ACCOUNT OF AN INTERVIEW CONDUCTED
BY NRC REGION I INVESTIGATOR, R. A. MATAKAS, WITH ME ON SEPTEMBER 23, 1981,
AT THREE MILE ISLAND. I PROVIDED THE INFORMATION WITH NO THREATS OR PROMISES
HAVING BEEN MADE. I HAVE ACKNOWLEDGED ITS CONTENTS WITH MY INITIALS, HAVE HAD
THE OPPORTUNITY TO MAKE CORRECTIONS AND THE INFORMATION SET FORTH IN THIS TRANSCRIPT
IS THE TRUTH TO THE BEST OF MY KNOWLEDGE AND BELIEF.

SIGNED: _____

DATE/TIME: 10/2/81 11:55 A.M.

SUBSCRIBED AND SWORN TO BEFORE ME

THIS 2nd DAY OF OCT 81

AT TMI, PA

Richard A. Matakas
INVESTIGATION SPECIALIST, USNRC

Matakas: This is Investigator Richard Matakas, from Region I, Nuclear Regulatory Commission. The date is September 23, 1981. Present during this interview are:

Matakas: And what is your position here?

Shift Technical Advisor, Three Mile Island, Unit 1.

Matakas: And Mr.

Wilson: John F. Wilson, Esquire, Attorney with inaudible and Liberman.

Matakas: Basically what I would like to do, is yesterday we talked about the exams that were administered by the NRC at TMI on April 21-24 and we got to a point where I wanted to ask you if you had any direct information that indicated that any cheating may have been going on during those tests that were administered between 21 and 24 April? Also before going farther I'd like to state that Mr. Wilson is here at my request and he is not representing inaudible as your attorney. Is that correct?

That's right. He's here at my request but he's not my personal attorney. Well to finish up from yesterday's discussion, it seems to me that I remember that the discussion fell into two broad categories. The first portion of the discussion involved specific questions about Mike Ross and whether or not he kept people out of the room or attempted to unfairly broaden the answer sheet. And the answer is that I gave to those questions I felt and still do feel good about them are inaudible true. The second thing that we talked about yesterday was about repeating rumors that I may or may not have heard. And I didn't then feel as though it was appropriate or correct to repeat to repeat rumors. I guess I still feel that way but I have been talking to a number of people, including Mr. Wilson, and believe that the greater good may be accomplished or the lesser evil may be accomplished if I do discuss rumors that I may have heard. So, could you repeat the question that you just asked me please?

Matakas: Ok. Specifically, what I would like to know, Mr. Wilson has talked to me about your conversation, and from our conversation, I understand that you may have some direct information regarding the possibility or that indicate the possibility of cheating on the exams administered by the NRC and I would like for you to discuss those that you have previously related to Mr. Wilson.

Ok. What I know in the way of first hand knowledge is that on, I believe it was a Thursday that the tests were given.

Matakas: Ok, would that have been, the test was given beginning the 21st, which was Tuesday, so Thursday would be 23 April 1981?

I believe it was the Thursday and that would have been April 23.

Matakas: The time is 0935 we have a telephone call. I will turn the tape off at this time. The time is 0936 the telephone conversation is finished going on with the interview.

Ok what I started to say was that I'm pretty sure it was on Thursday that the week of the tests were given and that would have been April 23 you say, right?

Matakas: That's correct.

Sometime in the morning, I can't really pin it down, but it seems to me it was about in the middle of the morning, a phone call came from the Shift Supervisor's office and they asked to talk to me. So when I got on the phone the person on the other end identified themselves to me

Matakas: Excuse me one moment did you answer the phone

No I didn't.

Matakas: Who did answer the phone?

I don't remember who answered the phone. It didn't ring as I recall, it didn't ring in the Shift Supervisor's office it rang in the control room and whoever was on duty out there answered it, and let me know that it was for me and so I picked it up. Anyway, the person who called identified themselves to me and asked me a question that I suspected was the type of question one might find on the NRC exam. So I asked that person, are you taking your NRC exam? He said no. I'm helping another person take their NRC exam. And I said well, I can't tell you the answer to that question right now. And they said, why not. And I said, I don't think it would be a right thing to do.

Matakas: Ok

So they said ok and that was the end of the conversation. They hung up and I hung up.

Matakas: Ok, before we go any farther. The caller identified himself to you. What did he, what name did he give?

He said, this is

Matakas: How long have you known

Well, I've known who he was since I started to work as the Shift Technical Advisor which would have been September of 79. I have never known him very well and I don't know him very well even today.

Matakas: But have known him professionally.

Right.

Matakas: Since when again?

Beg pardon?

Matakas: Since when September

Since September of 79. I started working as an STA in September of 79 and that put me in the control room or near the control room and he was a CRO or a CRO trainee. I'm not sure which at time, so I knew who he was.

Matakas: Ok. Did you work near a speaker phone?

Ya there was a speaker. The phone to answer on in the Shift Supervisor's office is a speaker, has the ability to be used as a speaker phone.

Matakas: Do you use the speaker phone?

It's my recollection that I did, ya.

Matakas: Who was present during this time?

Besides me in the room you mean?

Matakas: That's correct.

It's my recollection that another STA was present.

Matakas: And who was that?

His name is

Matakas:

Matakas: Did you recognize the voice as voice?

At the time that I took the call, I didn't question who it was that was calling in my mind. It was a man's voice. I don't know that I knew well enough to recognize his voice on the phone but he didn't

Matakas: Ok at the time of call, did not question identity of caller. Did you have any reason to believe that was not

At the time of the call or later?

Matakas: Well, at the time of the call or later.

At the time of the call I didn't question who it was but when I thought about it, and when I talked with another individual later I did question whether it was or someone just saying that they were que oned that in my own mind.

Matakas: At the time of the call did not question the identity of the caller. Ok, we will get the subject of what was said for just a little bit. You said later on you did question the identity.

That's right.

Matakas: How did that come about?

The way that came about is the caller told me that he was and the caller also told me that he was helping another individual take the NRC test. What I did was I talked to the person he identified as being helped in taking the NRC test. Now that person told me that he didn't ask for any help and didn't attempt to obtain any help and so I reasoned in my mind that if the caller misrepresented what he wanted the information for it was also possible that he would misrepresent his own identity on the phone. I suppose as I thought about it further it seemed to me that under the circumstances a person might be inclined to misrepresent their identity on the phone.

Matakas: So we're talking about of course as the person that identified as he was helping and denied ever asking or requesting any help from Is that correct?

That's correct. I'm surprised how you know that it was

Matakas: Pardon me?

I said that, you surmised correctly that, the person who called said he was helping take the test. I don't know how you know that.

Matakas: Ok, the voice itself, did you have any reason, in other words, did it appear that someone was disguising their voice or not disguising their voice. On the voice itself did you have did you have then or do you have now any reason to believe that it was not.

Based solely on the voice?

Matakas: Right.

Not based on any conversation I had with or any suspicions of my own just based on my recollection of that voice?

Matakas: That's right. In other words, looking back at it I mean maybe you can't comment on it at all, I'm not trying to put words in your mouth, what I'm getting at is looking back at it, you know, I don't know how long, we never got into how long it was before you talked to after the phone call, but at that time you know you may have rang something in your head that maybe the person was disguising their voice. I don't know and that's why I'm asking you.

At the time I didn't question in my mind whether this person was disguising their voice or was someone else. Just the question itself never entered my mind. It wasn't until after I talked with that the question entered my mind. Now thinking back and trying to remember the voice and whether I can remember that voice I don't think I can remember how that voice sounded. I can remember what he said but I can't remember the sound of that voice, the tone or.

Matakas: Ok, the caller identified himself and said this is We will go from there as far the conversation of the way that he first, he said this is and then he asked.

Well he said This is I got a question for you, or words to that effect. I said ok. Or words to that effect and he asked me a question and I don't recall entirely but it seems to me that it was a question that was along the lines of what happens to fuel pin temperature over core life if an oxidizing layer builds up on a cladding surface. Now that may not be the exact question but it was a question dealing with those kinds of things.

Matakas: And what did that indicate to you?

Well, I questioned in my mind why a person would want to know the answer to that question at that particular point in time.

Matakas: You knew the test was going on.

I knew the tests were going on.

Matakas: Did you question his reason for wanting to know?

So I said words to the effect, are you taking your NRC test right now?

Matakas: And.

He said no, I'm helping, he said words to the effect of, no I'm helping take his.

Matakas: Did he say or did he say

My recollection is he didn't use a last name.

Matakas: And then?

Beg pardon?

Matakas: And then what what did you tell him in answer to that.

I said I can't tell the answer to that now. He asked me why I couldn't and I told him, didn't think it would be fair. And then I told him, well, he said ok, first he said ok, and then I told him if either he or I was interested in knowing the answer to that question, that I'd be happy to tell them after the tests were over. For their own information.

Matakas: What did he say to that?

He said ok, and then he said good-bye and that was the end of the conversation.

Matakas: You said I believe.

Yeah.

Matakas: Did I have any comment?

and I talked about it for a little bit.

Matakas: Do you remember what?

I think it was pretty short and I said basically words to the effect of, I hope those guys can understand.

Matakas: Did have any comment on that?

said words to the effect of, you did what you have to do.

Matakas: Ok up until, up to this time of this telephone call, had you heard that anything like this was going to be taking place? People getting answers from people or or anything to this effect anything in this area, up to this time?

Could you tell me what, I'm trying to figure out, you're saying up until this time had I heard that this was going to take place that they were going to be

Matakas: Alright what I'm getting at is, if this did in fact take place was it a preplanned thing where possibly this person was getting answers for more than one person.

That I don't know. I don't remember of hearing that this or anything like this was being planned or was planned to take place for those tests, ok. I was surprised when I got the phone call.

Matakas: At this time the time is 0952 and I would just like to take a short break just to make sure that the recorder is picking up what we are talking about. I will turn it off. Ok the time is 0955 and our break was extended a short time due to a Unit 1 fire drill. Ok, after this time, after you received the phone call, you mentioned before that you talked to whom identified as the person that he was or whom you assumed he was identifying due to and I take it that first name is

first name is and he was and was the only that I knew of taking the test. I guess that I'd like to point out that I don't know that I don't know that it was who identified as the person that was the person being helped. I just know that the caller identified as the person the caller also identified himself as I'm making that distinction.

Matakas: Ok would you tell me approximate time period and the setting if anybody else was present when you talked to The time is 0956 a telephone call a short break please. Ok the time is 1002 Mr. Wilson is going to have to leave to make a telephone call, we'll have to stop the interview until he returns at that time. Thank you. Ok the time is 1018, Mr. Wilson has returned to the interview room.

Matakas: Mr. Wilson.

Wilson: This is John Wilson. I proceeded to my office to make a phone call to Mr. Clark. When I arrived at my office Mr. Arnold was already on the phone to the office and the discussion ensued as to the propriety of my being present in the interview room. I came back and discussed it with [redacted] as to the purpose of why I was originally here which was twofold. One, to ensure the demeanor of the interviewer as being equitable to [redacted] and two, to try to take notes in the meeting so that whatever [redacted] said would be accurately recorded in context by the NRC. The second reason for being here is not a controlling reason since the interview is being recorded and at this point has a comfort level as to the demeanor of the interviewer such that he no longer feels my presence is necessary. Therefore, I'm going to be excusing myself from the interview.

This is [redacted] and I'd like to say that I feel comfortable with the way the interview is gone up to this point in time and it is on that basis that I feel comfortable with Mr. Wilson's leaving.

Matakas: This is Rich Matakas. The time is 1020. Mr. Wilson will depart the interview. If [redacted] has any questions or any problems he will be allowed to immediately contact Mr. Wilson for any questions that may arise. As you can hear we have another telephone call. We will take a break at this time. The time is 1023. Mr. Wilson has excused himself and present here at the interview still is myself, Richard Matakas, and [redacted]. When we left off the previous portion of the interview regarding [redacted] contacting [redacted] regarding the conversation he allegedly had with the person who identified himself as [redacted]. If we are a little repetitive I'm sorry we've had some interruptions but we'll go on at this point. [redacted] if you would, again I think the last question I asked you was would you go over the approximate time period and the situation was anybody present you know when you talked to [redacted] on the first time.

Ok, well, [redacted] was taking the test Thursday and Friday, as I remember and it was the first opportunity I got after that when I was with him alone. I can't remember what day of the week that was, if it was Saturday or if it wasn't until the following Monday. It was at some point in time when he and I were alone and I told him what had happened that I had gotten a phone call and that the guy who called said he was helping [redacted] take an NRC test. I specifically asked if it was true cause I was surprised would have been surprised had it been true. Knowing [redacted] the way I do and he said, no, it wasn't true that he hadn't asked for or sought in any other way to get help on his exam. And I believe him.

Matakas: This conversation I take it was before the NRC investigation which has identified [redacted] and one other individual as suspecting of having cheated on their NRC test. Is that correct?

Ya that's correct. It was well before that. I would be confident in saying that no more than a week at the most transpired from the time I got the phone call until I talked to [redacted] about it and that's a conservative estimate. Probably on the order of several days at the most.

Matakas: While we are still on this subject, after the NRC investigation and after I believe it was [redacted] resignation?

Right.

Matakas: Did you have a conversation about what had happened with [redacted]

Ya I talked to [redacted] about it one other time and that was as you say after [redacted] no longer worked for GPU. Again I asked him if there was any involvement on his part. Again he told me, no. And again I believed him.

Matakas: Did you have any other conversation with [redacted] after the first time you confronted him about the telephone call?

I never confronted him, [redacted] about the telephone call.

Matakas: Oh I'm sorry I, in between all the interruptions that we have I somewhere thought that you had mentioned that you had talked to [redacted] if he in fact was the person that called.

I never talked to [redacted] about the phone call.

Matakas: Ok did you talk to anyone else besides [redacted] and myself and Mr. Wilson at this time regarding that telephone call? That you recall?

I talked to my wife about it.

Matakas: Anybody in Met Ed or GPU management or any other people that were taking the test?

No nobody in Met Ed or GPU management or anybody else taking the test. I talked with my wife and my parents about it.

Matakas: Did, has requested a break at this time. Is that correct
 The time is 1028 and we'll shut off the recorder. Ok the
 time is now 1033 we are starting the interview the last question that
 I asked was had he had any conversation about this telephone
 call with anybody from Met Ed, GPU and right before you know he answered
 that question he wanted to take a break he regrouped his thoughts and
 again I would like to present that question to him. after
 receiving the phone call, I know you've already told me that you
 talked with about it you talked to about it,
 you talked to myself and Mr. Wilson about it, and you also mentioned
 your wife. Is there anybody in Met Ed or GPU management or anybody
 else that had took the test that you discussed the telephone call that
 you got?

I don't I don't believe so. It's possible that it there is another
 person that I discussed it with. Ok. I just realized I talked with
 Ron Toole about it yesterday morning.

Matakas: Ok and was it basically the same thing that we talked about here?

Ya I recounted for Mr. Toole the sequence of events in the same way
 that I did just here today.

Matakas: Did Mr. Toole give you any information that may shed light on any of
 this?

He didn't well like he didn't say anything that could shed light on
 any of this he didn't I'm not even sure that he that he you know knew
 about it or until I told him. I don't know about what he could have
 said.

Matakas: Did you have or have you heard any other information that may relate
 to any individual sitting outside the classroom and in order that he
 could provide information to people that were taking the test?

What are you asking?

Matakas: Well what I mean is had you heard anybody else make any mention of
 this situation from our discussion it appears that possibly if that
 person who identified themselves did in fact identify themselves correctly
 as that maybe was outside of the classroom
 providing assistance to possibly at least What I'm asking
 is had you heard any other rumors or any other statements which would
 indicate that someone was outside the classroom providing information
 to anyone else that took the test.

As we have mentioned earlier, and discussed earlier, repeating rumors is something that I find difficult to do, more on principal than anything else. However, in this case, I think that I have to overcome my objections to say that ya I heard a rumor that rumor I heard at some time following the investigation that involved

I don't recall where I heard it or who I heard it from it may have been heard I may have heard it several times from different people but the rumor went to the effect that a person was in the vicinity of the room that the test was given in and that his purpose for being there was to help people who were taking the test with answers that they with questions that they didn't know the answers to.

Matakas: Was this any specific test or the information you heard was just general in nature as you have stated it?

The information in the rumor that I heard was general in nature as I stated. It didn't say which day, which test, who, where, as to regards to which room or anything like that.

Matakas: Was there any indication, again I know this is rumor I know it's difficult for you to talk about it, but was there any indication that anybody in a management level was aware that this was going on?

Another rumor that I had heard at another point in time was that this person was performing his duty so to speak with at least the knowledge of someone higher up in the company. I find this rumor hard to relate because I don't know what's meant by higher up in the company. I don't know what department this person might have been in, if there was such a person, and I surely don't know who it was.

Matakas: Ok when you say that this, you said that this person was there with management knowledge are you talking about the person outside the classroom?

When I said that the person was there with the knowledge of someone higher up in the company, I was talking about the person outside the classroom who was providing the help. What I don't know is whether higher up in the company means management level or what level.

Matakas: Was there prior to the test being administered did you have any information or did you hear anything first hand or hear any rumors about any conspiracy to cheat on the test by any individuals who had to take the test?

No, I didn't hear first hand or by any other means of any conspiracy before hand to cheat on the test.

You might say I didn't hear any rumors of a conspiracy, or at least what I would call a conspiracy, to cheat after the test. The only thing I've heard is the two rumors I just related. And I guess if you put those two things together, a person might think of it as a potential conspiracy.

Matakas: Did you have any information or did you hear any comments regarding getting together with any other individual and talk about cheating on the test?

Well, there was a recent investigation done, as I understand it, I don't know it first hand, it's another rumor, at least to my knowledge, that an investigation was done that involved and another individual because they had been talking about cheating on the test, not they themselves cheating but cheating have taken place on the test at some common gathering.

Matakas: In other words what you are saying is that an individual related to you that they overheard and by we're talking about,

That's right.

Matakas: And by we're talking about

Matakas:

Right.

Matakas: That someone overheard those two individuals talking in general about cheating on the test.

No, not that specifically. What I heard was that had to talk to company officials because they'd been overheard discussing cheating on the exam at a friends and family at TMI meeting is what I heard. Whether that's true or not I can't say.

Matakas: Do you know who they had to talk to?

The impression that I got, I can't recall exactly, but I was definitely under the impression that they were talking to Mr. Arnold.

Matakas: Do you recall who gave you that information?

No, I don't remember where I heard that.

Matakas: I'd like to give you a piece of paper that we talked about yesterday regarding the test itself and the administering of the test. I typed up what I information that I got out of our conversation, I'd like you to look it over and make any changes that you wish and let me know if you feel that it is an accurate account of what we talked about yesterday.

Should I tell you what to do?

Matakas: No, just make any corrections. All corrections on there just go ahead and put initials where anythings been crossed out or where anything has been added.

Ok, I've looked at it and made a couple of changes and I believe it's a fair and accurate representation of what I said.

Matakas: We also have a tape that made from yesterday regarding this information which he will make available to us to copy. I'd like to ask you just a couple more questions Did you personally cheat on any of the tests that you took?

No sir.

Matakas: Other than what we've discussed on this tape and what we previously discussed yesterday and that has been recorded, do you have any other information at all regarding cheating or any information that you haven't told me on the last tape regarding any action by any Met Ed employee or GPU employee which would indicate that they had tampered with the test or the testing procedures in any way such as attempting to keep the proctors out of the room or by devious means attempting to expand the answers while reviewing both the test and answer sheets with the proctors?

I'm going to have to try to answer each of those sections. I don't know of anything other than what I said yesterday in regards to anybody broadening the answer key or changing the answer key by any other means. I don't know of anybody deliberately trying to keep the proctors out of the room for any reason at all. I don't know of cheating that took place on these tests other than what I've been able to find out about the investigation that took place earlier this fall with
Does that pretty much answer what you asked or is there something else in there that I didn't.

Matakas: Yes. No I think that's fine. Ok the time now is 1048 this will complete this interview. Upon completion I will remove the tapes I will break out the clips so the tapes cannot be erased, and Mr. John Wilson has assured me that copies of this tape will be made available. This is the end of the interview with
at Three Mile Island on September 24, 1981.

(I MEANT THE 23rd)

ENCLOSURE 9

24 Sept 81, 1554 hrs

TMI - NRC Complex

I, _____, hereby make the following voluntary statement to Mr. William J. Ward who has identified himself to me as an Investigator with the U.S. Nuclear Regulatory Commission. I make this statement freely with no threats or promises of reward having been made to me. Mr Ward is typing this statement with my permission.

I am employed as MetED/GPU Nuclear as a shift supervisor at Unit 1. I have been employed since 1967.

Mr Ward has asked me to explain certain remarks that I have allegedly made to members of my management to the effect that "the people responsible for the cheating are still around". First of all, I would like to say that I have no recollection that I used those words. ~~I am fairly sure that I would not have used the word "cheating"~~ Further I do not specifically recall such a conversation, ~~or~~ based on what Mr Ward has told me, I suspect that this interpretation comes from a conversation that I had with Ronald Toole, Director of Operations & Maintenance, Unit 1.

I believe the conversation in question came at a time that I was still upset by the termination of _____ What I meant to say was that _____ must have ~~not~~ been compelled to cheat either because they were not prepared, or because they felt they were not prepared. On the other hand, the people who should have prepared them, or given them sufficient time to be prepared, are still employed whereas _____ are not. I just didn't think that it was fair and I was (and still am) upset as a result. I did not mean to suggest in any way that I knew of other people who cheated.

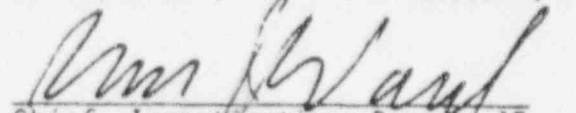
I personally did not cheat or assist anyone in the exams that I took. I do not have direct or indirect knowledge of anyone cheating on those exams (The RO/SRO exams in April, 1981).

I have read the forgoing one page statement. I have made any necessary corrections and have initialed them. This statement is the truth to the best of my knowledge and belief. I declare under penalty of perjury that the foregoing is true and correct. Executed on September 24, 1981 at 1632 hrs.

Subscribed and sworn to before me this 24th day of September, 1981 at Middletown, Pa

WITNESSED:




Chief, Investigations Branch, IE
USNRC
1655 hrs

ENCLOSURE 10

Place: Three Mile Island
Date: 9-25-81

STATEMENT

I, PETER F. BACI, hereby make the following voluntary statement who has identified himself to me as an Investigator with the U. S. Nuclear Regulatory Commission. I make this statement freely with no threats or promises of reward having been made to me. Investigator BACI is writing/typing this statement for me at my request.

This statement summarizes the information which I provided to Mr. Baci and Mr. Ray Smith, another NRC investigator, during a meeting held in NRC Trailer #5 at Three Mile Island on September 24, 1981. I am currently employed by M.E.S./GPH as a Shift Technical Advisor (STA) in Unit 1 and have been with the Company since 1977. In addition, I also took the RC and SRC exams which were given by the NRC on April 31 and 22, 1981.

Mr. Baci asked me if I recalled a telephone conversation which reportedly took place on Thursday or Friday (4/23 or 4/24/1981) while I was in the Unit 1 shift supervisor's office. The conversation is referred to that it is with an individual calling and asking ~~for~~ to speak to

The caller reportedly identified himself as ^{FOREMAN} (Shift Supervisor Unit 1) and asked for information on "what happens to fuel pin temperatures over course of an excursion (could build up on the cladding surface?)". I told Mr. Baci that I recall the telephone call but that I don't remember if I heard it myself over the speaker but (speaker phone) and if my recollection stems from my discussion of the matter after the call with ^{FOREMAN} The question seems like the type of question people would go to ^{FOREMAN} with and is somewhat of an "expert" and that was all.

call the conversation, that the caller was partially that he asked a question concerning something on an NRC exam. I remember telling the caller that he could not answer the question until after the exam; however, I do not remember telling me or hearing directly that the caller was seeking this information to assist a third party. He was in the process of taking an exam.

My discussion with concerning the above was thereupon forgotten until after my recent interview with Mr. Bacci on 9/15/81. Subsequent to that meeting, asked me what the NRC investigators were asking people it related that it had to do with the proctoring of the exams and the review by Nat Ed of the tests and answers. asked me if I thought they would want to speak with him. I said no because they were interested in the answer and not the test. I wasn't involved in that. Then brought up the phone call he had received while in the shift supervisor's office and asked whether this (the NRC) would want to speak to him about that. He had questions about that call and told him I didn't know if the NRC would want to discuss that matter.

Mr. Bacci asked me if I had ever cheated on the April 1981 exams or on any tests given while I was employed at the NRC. I replied in the negative. Further, I told him that I was not even

of anyone else who had no intention did at ever and
assist or facilitate cheating by any licensee
involved at TMI.

I have read the foregoing statement consisting of 3 handwritten/~~typed~~
pages. I have made and initialed any necessary corrections and have signed my
name in ink in the margin of each page. This statement is the truth to the best
of my knowledge and belief. I declare under penalty of perjury that the foregoing
is true and correct. Executed on 9/25/81 at 1408
date time

INTERVIEWEE: NAI

Subscribed and sworn to me this 25th day of Sept., 1981,
at Three mile island.

INVESTIGATOR: Peter E. Gann 14:09
NAME:

WITNESS: Raymond H. Smith 14:10
NAME:

ASSOCIATED TECHNICAL TRAINING SERVICES, INC.
REACTOR OPERATOR EXAMINATION

FACILITY _____
 REACTOR TYPE _____
 DATE ADMINISTERED _____
 EXAMINER _____
 APPLICANT _____

INSTRUCTIONS TO APPLICANT:

Use separate paper for the answers; staple question sheet on top of the answer sheets. Points for each question are indicated in parenthesis after the question. An overall score of 80% or greater and 70% in any individual category is considered passing.

<u>Category Value</u>	<u>% of Total</u>	<u>Applicant's Score</u>	<u>% of Cat. Value</u>	
_____	_____	_____	_____	A. Principles of Reactor Design
_____	_____	_____	_____	B. Features of Facility Design
_____	_____	_____	_____	C. General Operating Characteristics
_____	_____	_____	_____	D. Instruments and Controls
_____	_____	_____	_____	E. Safety & Emergency Systems
_____	_____	_____	_____	F. Standard and Emergency Operating Procedures
_____	_____	_____	_____	G. Radiation Control & Safety
_____	_____	_____	_____	H. Principles of Heat Transfer and Fluid Mechanics

FINAL GRADE _____ %

DO'S AND DON'TS FOR EXAMS

DO'S

1. READ THE QUESTIONS CAREFULLY.
2. NOTE THE NUMBER OF POINTS ALLOTTED TO EACH QUESTION.
3. QUESTION THE EXAMINER IF IN DOUBT.
4. PACE YOURSELF.
5. SHOW ALL CALCULATIONS.
6. LOOK FOR ANY TWO-PART QUESTIONS WHICH MAY NOT BE LABELED AS SUCH.
7. RECOGNIZE WHETHER DEFINITION OR EXPLANATION (DISCUSSION) IS REQUIRED.
8. LIST MORE THAN TWO REASONS IF SOME OR FEW ARE REQUESTED.
9. JUSTIFY, WHERE POSSIBLE, USING MATHEMATICS TO REINFORCE A CONCEPT.
10. WRITE CLEARLY

DON'TS

1. LEAVE ANY BLANKS
 2. READ HIDDEN MEANINGS INTO THE QUESTIONS.
 3. SHOW THE EXAMINER YOUR ANSWERS FOR HIS CONCURRENCE.
 4. WRITE YOUR NAME ON EVERY SHEET.
-

A. Principles of Reactor Operation (16)

1. During a reactor startup, an operator finds that the reactor is critical with a 5000 CPS indication. Later, after one month of power operation, he is again starting up the reactor and assumes the reactor will again be critical at 5000 CPS. Is his assumption correct? JUSTIFY your answer. 12.1
2. A reactor shutdown by 5% has a normal source level of 10 CPS. If the K_{eff} of the reactor is increased to .98, what should the approximate count rate be at this time? Show all assumptions and calculations. 11.1
3. Describe the various means by which a neutron can be lost to the system following production from fission. 11.1
4. There are 1000 neutrons in a particular generation of which 993 are "prompt" neutrons and 7 are "delayed" neutrons. There were 995 neutrons (total) in the preceding generation
 - a. Define prompt and delayed neutrons. 11.1
 - b. Is the reactor subcritical, critical or super critical? 11.1
 - c. Explain how the 7 delayed neutrons have an effect on the control of the reactor. Use the above case as an example. 11.1
5.
 - a. Describe how xenon and samarium are formed and depleted during reactor operation, including important half lives. 11.1
 - b. Give three reasons why samarium is less important than xenon in reactor operation. 11.1
6. During a normal control rod withdrawal for obtaining criticality the following data was obtained:

At 0800, $K_{eff} = 0.99$, cps = 20
At 0805, the operator adds 0.4% k/k
At 0810, the operator adds 0.4% k/k

 - a. Sketch the count rate versus time. Extend the curve for nine (9) minutes after the last maneuver. Identify each new stable count rate. 11.1
 - b. Briefly explain the shape of the curves. 11.1

B. FEATURES OF FACILITY DESIGN (15)

1) Figure B-1 provides the outline of the Once Through Steam Generator (OTSG).

a. Sketch the location of the steam and feedwater nozzles. 1.1

b. Sketch and identify the feedwater control valves that are controlled by ICS and/or the control room operator. (1.1)

2. Figure B-2 contains an outline of the reactor vessel, the OTSGs and the pressurizer.

a. Sketch and label the remaining piping in the RC system. Include direction of flow. (2.1)

b. Sketch connections to other systems. Include any motor operated valves and components within the reactor building. (2.1)
(Do not include drain or vent valves)

3. Starting at the condenser hotwell, list the following items in sequence as they are found in the condensate and feedwater system. (1.1)

- Low Pressure Heaters
- Condensate Pumps
- Feedwater Control Valves
- Steam Packing Exhauster
- High Pressure Heaters
- Feed Pumps
- Steam Generators
- ✓Hotwell Pumps
- Feedwater Flow Elements
- Powdex Vessels
- ✓Condensate Coolers
- ✓Hydrogen Coolers
- ✓Resin Trap

4. a. List three (3) of the liquid systems associated with the Reactor Coolant Pump and the purpose for each system. (1.1)

b. On a loss of any of these systems must you trip the RCP? Explain your answer. (1.1)

c. What is the normal pressure drop across #1 seal? 1.1

B. FEATURES OF FACILITY DESIGN (13) continued

5. Why does the RCS hot leg sample line have a delay coil in the line while the Pressurizer liquid space sample line does not?

C. General Operating Characteristics (17)

1. The operator is conducting a routine reactor startup. After leveling off at 10-9 amps and logging the data, he withdraws the control rods and establishes a .8 DPM SUR.

If he performed no further rod motion, how long would it take before he saw the first effects of nuclear heat? Show all calculations and assumptions.

2. a. Why is oxygen concentration in the reactor coolant controlled?
b. Give two (2) sources of oxygen in the cooling system at power.
c. How is oxygen concentration in the reactor coolant controlled? (All modes.)
3. A reactor startup is in progress and it is calculated that 200 ppm of boron must be diluted to get to the critical boron concentration before pulling the control banks. Prior to the beginning of the dilution the source range monitors read 30 and 33 CPS. After diluting 100 ppm of boron, the same instruments read 62 and 68 CPS. Should you, as a reactor operator, go ahead with the planned dilution of another 100 ppm? JUSTIFY your answer.
4. While at equilibrium full power, a change is made in the circulating water system that increases condenser pressure by 3 inches of H_g absolute. Describe the changes, if any, in the following?
 - a. Generator Output
 - b. Governor valve position
 - c. Tavg
 - d. Nuclear power.
5. a. What would be the level indication response if the reference leg to the pressurizer level ΔP cell should fail? Explain.
b. What would be the flow indication response if the diaphragm in the feedwater flow ΔP transmitter should fail? Explain.

C. General Operating Characteristics (17) continued

6. Explain how xenon behaves following a reactor trip from 100% and following a power increase from 50% to 100% after 1 week of operation in each case. ---
7. Fifteen minutes after a trip from full power the reactor is producing mostly delayed neutrons at slow energies. Explain why you agree or disagree with this statement. ---
8. Figure C-1 provides the following parameters, Pressure, temperature, and reactor power.
 - a. Sketch the normal R. C. temperatures (T_{hot} , T_{cold} and T_{ave}) between 0 to 100% power. ---
 - b. Plot OTSG steam temperatures and pressure between 0 to 100% power. ---
 - c. What degree of subcooling is expected at 0% and 100% power? (Utilize attached Enclosure 1) . ---

D. Instruments and Controls (18)

1. Flux tilts may be categorized as either axial or radial.
 - a. What is meant by axial or radial flux tilts? 1.1
 - b. Describe how the instrumentation is utilized to detect each of these flux tilts. 1.1
2. Describe the control and alarm functions obtained from the three ranges of out-of-core nuclear instrumentation during shutdown, startup and power operation. 1.1
3. The PZR power operated relief valve may be operated in Remote Manual and automatic. It also has indications in the control room.
 - a. What conditions will open the valve in automatic? (Include present set points). 1.1
 - b. How does the staff open the valve manually? 1.1
 - c. What indications are available to inform the operator if the valve is (i) open and (ii) closed. 1.1
4.
 - a. Utilize Figure B-1 to sketch the location of the OTSG level sensors. 1.1
 - b. When is each level sensor utilized by the ICS or by the operator in controlling level? 1.1
 - c. What will happen if the controlling D/P cell bellows fails? 1.1
5. Utilize Figure B-2 to show the location of level, temperature, pressure and flow sensing devices in the:
 - a. R. C. system, include the core region. 1.1
 - b. Pressurizer. 1.1
6. The Integrated Control System (ICS) has features which initiate (i) Tracking and (ii) Runback.
 - a. List the conditions which the ICS will go to "Tracking". 1.1
 - b. What conditions initiate a runback? 1.1

NOTE: Include present set points and any rates associated with each condition.

E. Safety and Emergency Systems (17)

- 1) List the conditions that will cause a reactor trip. Include logic (1 of 2, 2 of 4, etc.) and present set points. Asterisk those which have been changed/added since the TMI accident.
2. Your reactor is equipped with internal vent valves in the top of the core support shield.
 - a. Utilize a simple sketch to show their location with reference to the reactor vessel nozzles.
 - b. Under what condition(s) will the vent valves open?
3. Assume the reactor building (RB) pressure begins to increase at a rate of 2 PSI/min.
 - a. List the automatic actions that will occur and when.
 - b. What components are used to reduce RB pressure and include the "heat sink" for each component?
4.
 - a. In addition to the core flood nozzles, the LPI System can discharge into other points. What are they?
 - b. In the injection phase, the LPI is lined up to inject into the core flood nozzles. Discuss the reason why, in some circumstances LPI injection may not be desirable.
 - c. Discuss the alignment of the LPI system for Recirculation if RCC pressure remains higher than the shutoff head of the LPI pumps.
5. Assume a LOCA with a pressure decay curve as presented in Fig. E-1, occurred at your facility. Utilize Fig. E-1 to indicate:
 - a) Points of ECCS actuation
 - b) Shutoff head of each component
 - c) Rated flow or capacity of each component

F. Standard and Emergency Procedures (16)

1. The plant is operating at 75% full power. A leak develops in a tube in a steam generator which rapidly escalates to 165 GPM.
 - a. Explain the instrument response which will enable the operator to decide if it is a steam line break, steam generator tube failure or a primary system failure. (Include the reasons for rejecting the other two possibilities.) (2.1)
 - b. Explain the instrument response which will enable the operator to determine which is the affected steam generator. (2.2)
 - c. Describe flow paths by which radioactivity in the steam generator could reach the environment. (2.3)
2. a. Briefly describe how a bubble is drawn in the pressurizer. (2.4)
- b. What instruments would you monitor on the pressurizer and what would be their indications from just before to just after formation of the bubble? (2.5)
3. Assume an oil line on one of the feed pump turbines cracks and sprays oil on a steam line. The oil penetrates the lagging and ignites.
 - a. The turbine building operator observes this condition. What should he do? (2.6)
 - b. What individuals, by title, constitute the on-shift Fire Brigade? (2.7)
4. Should the availability of the RCP's be lost for some reason, decay heat would have to be removed from the core by natural circulation.
 - a. What RCS conditions should be established to insure adequate natural circulation? (2.8)
5. During a load increase, the pressurizer spray valve opens and will not close. Attempts to isolate it are nonproductive. Pressure is decreasing at 100 PSI/minute with all pressurizer heaters on.
 - a. What emergency procedure(s) can be used for this malfunction? (Indicate title only) (2.9)
 - b. What immediate action steps would be required? (2.10)
 - c. Assume no supervisory personnel are available to assist you. Outline how you would terminate (2.11)

G. Radiation Control and Safety (16)

1. What, if anything, is wrong with the operators' action in a radiation area in the following situations?
 - a. He enters the area with a GM instrument, it reads zero, so he proceeds about his work. 2.1
 - b. He observes a puddle of water on the floor, takes his lab coat off, wipes up puddle, throws coat into contaminated waste container, and proceeds about his business. 2.1
 - c. He cuts his hand, forces bleeding to clean the wound, places a bandage on the cut and proceeds about his business. 2.1
2. Why is I-131 considered the limiting isotope in many accident studies and waste release limits?
3. a. An operator standing 15 feet from a known small radioactive crud deposit in a pipe fitting measures 1000 mrem/hr. on a portable instrument. He must operate a valve 5 feet beyond the source. What is the dose rate at the valve he must operate? Show your work. 2.1
- b. What methods of exposure control could be employed to limit his radiation exposure? (2.1)
4. Define the following terms:
 - a. Biological half-life. (2.1)
 - b. Effective half-life. (2.1)
5. What is the major source of radiation in the reactor coolant loop areas during:
 - a. Operations? (2.1)
 - b. Shutdown? (2.1)

G. Radiation Control and Safety (16) continued

6. Attached Fig. G-1 shows the variation of charge collected versus applied voltage for gas-filled detector chambers.

- a. Name the six regions and give a brief description of what is taking place in each.
- b. Indicate which regions are used in portable radiation monitoring instruments.

2.0

1.5

- c. Give an example of a portable instrument at your facility which operates in each region listed in (b).

1.5

- d. For each instrument listed in (c), give a specific example of when you would use it.

1.0

- (7) What is the required response if a high radiation alarm is received on the reactor coolant letdown monitor?

2.0

See Graph

H. Principles of Heat Transfer and Fluid Mechanics (16)

1. a. The TMI reactor will produce significantly more heat than will ultimately be converted to electricity in turbine-generator. Name four (4) sources of energy loss within the plant. ---
b. Approximately what percentage of the total heat generated in the reactor is converted to electricity? ---
 2. a. Explain what is meant by NDTT? ---
b. When the plant is in a cold shut down condition, the temperature of the reactor vessel is below NDTT. Explain why this is or is not an unsafe condition? ---
 3. Explain why it is desirable to rapidly reduce the full-power Tavg after a Rx trip. Include value. ---
 4. A cylindrical tank has a diameter of 8 feet and a height of 12 feet. It is filled with water to a height of 10 feet. What is the pressure in psi at the following points.
a. At the bottom of the tank? ---
b. Four (4) feet up from the bottom of the tank? ---
- Note: The weight of water is 62.4 LB/FT³
5. Explain how the build-up of corrosion products (CRUD) on the fuel elements affects fuel temperatures. ---
6. a. A partially-filled tank has an air volume above the liquid surface of $4 \times 10^5 \text{ in}^3$ and an initial pressure of 14.7 PSIA. The tank is drained with the vent closed, until the air volume reaches $7 \times 10^5 \text{ in}^3$. What is the pressure in the tank? ---
b. After draining, the surface area of the tank above the liquid level is 40,000 in². What is the force acting to collapse the tank? ---
 7. a. What conditions, other than trapped air, can cause pump cavitation? ---
b. How would you observe this condition? ---

STATEMENT

I, _____, hereby make the following voluntary statement to PETER F. BACI who has identified himself to me as an Investigator with the U. S. Nuclear Regulatory Commission. I make this statement freely with no threats or promises of reward having been made to me. Investigator BACI is writing/typing this statement for me at my request.

This statement contains the information I gave to NRC Investigators BACI and Smith on September 24, 1971 at the NRC Office at Trine, Ind.

Mr. Baci asked me if I recalled a telephone conversation between Shift Technician Husted (S-7)

and myself which took place on either April 23 or 24, 1971. I explained that it was in a "training session" at the time. Two days and nights in the office of Charles HUSTED in the old training facility and he

taught me communications via teletype. He told me that while I had no exact recollection, I quite strongly could have called

it a "training session" and a "training session" to be correct. The name of the person who was involved in the conversation was HUSTED and the subject was the

operation of the reactor. Mr. Baci told me that

one of the things that I had said was that I had identified myself as

the shift technician. He asked me to sign the lines of the statement to look in the telephone book for the name of the person who was involved in the conversation. I signed the statement to Mr. Baci.

it was taking the NRC exam, to which it purportedly replied "no, I'm helping someone else take their NRC exam." The conversation reportedly continued with me identifying as the individual it was helping and telling me he could not answer the questions until the exams were all completed.

It wish to go on record as saying that while it may have spoken to during that time period, it would have been to see assistance or clarification in questions it was reviewing. It did not ^{knowingly} provide information to anyone while within the process of taking the NRC exams, including and also deny seeking anyone's assistance, including It did not with anyone else in cheating on these tests It myself did not cheat on these exams or on any examinations related to my employment as a licensed assistant bar it did not ^{knowingly} facilitate or otherwise provide anyone else, including it or cheat.

It would like to state that the assistance rendered to me was a combination of and it would be like an assistance in answering. First it is my opinion that most people who are in on the through various ways by including itself in question. It did not Mr. Bae that it was not aware of any attempt on the part of

Page 3
of 3

or Met-Ed management to facilitate cheating by any of its employees. I reiterated my earlier commitments to him that while I had heard the alarming and unsubstantiated rumors of cheating immediately following the tests in April, I did not have them seriously; - My first knowledge of what was reported as actual cheating came after the investigation into the situation in June 1981.

I would like to repeat that I have not and do not create, ^{knowingly} provide information or assistance to anyone in the process of taking an NCE exam or in any way assist them in cheating.

I have read the foregoing statement consisting of 3 handwritten ~~pages~~ pages. I have made and initialed any necessary corrections and have signed my name in ink in the margin of each page. This statement is the truth to the best of my knowledge and belief. I declare under penalty of perjury that the foregoing is true and correct. Executed on 9-25-81 at 1315 time.

INTERVIEWEE: _____

Subscribed and sworn to before me this 2 6 day of Sept, 1981,
at Three Mile Island.

INVESTIGATOR: Det. E. G. [Signature] 13:16
NAME: _____

WITNESS: Raymond H. Smith 13:17
NAME: _____