## UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

In the Matter of:

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IE TMI INVESTIGATION INTERVIEW

of Theodore F. Illjes Control Room Operator, Nuclear

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

May 23, 1979 (Date of Interview)

July 4, 1979 (Date Transcript Typed)

(Tape Number(s))

7908200215

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NRC PERSONNEL:

Anthony Fasano Mark E. Resner

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RESNER: The following is an interview of Mr. Theodore F. Illjes. Mr. Illjes is employed with the Metropolitan Edison Company at the Three Mile Island facility. His job title is control room operator nuclear. The present time is 3:43 p.m. Eastern Daylight Time. Today's date is May 23, 1979. This interview is being conducted in Trailer 203, which is located just outside of the south gate to the Three Mile Island facility. Individuals present for this interview representing the U.S. Nuclear Regulatory Commission are Mr. Anthony Fasano. Mr. Fasano is an Inspection Specialist with Region I of the U.S. Nuclear Regulatory Commission. Moderating this interview is Mark E. Resner. I am an Investigator with the Office of Inspector and Auditor, Headquarters, Nuclear Regulatory Commission. Prior to taping this interview, Mr. Illjes was given a two-page document which advised him of the authority, purpose and scope of this investigation. In addition, it apprised Mr. Illjes that he was entitled to a representative of his choice to be present during this interview. Also it apprised him of the fact that he is in no way compelled to talk to us if he does not want to. Now, I have asked Mr. Illjes at this time if he will please give us a brief resume of his educational and job experience as related to the job he is currently performing. Mr. Illjes.

ILLJES: Graduated from Northborne High School, Long Island, New York.

Spent two years at Colorado State University and in the Navy for 7 years, 3 months. In the nuclear program in the Navy, I was a mechanical operator and also an engineering lab technician. I received training as an auxilary operator for Metropolitan Edison for approximately a year of training prior

to start up of Unit 1. Worked as an auxiliary operator for approximately 3½ years and bid on control room operator and we had my cold license for Unit 2 as a control room operator. Am presently a control room operator at Unit 2.

RESNER: All right, Mr. Illjes, with your permission we will refer to you as Ted during the tape. Prefer to be called that?

ILLJES: Suits me.

RESNER: Alright. At this time Mr. Fasano has some questions that I am sure he would like to ask.

FASANO: Ted. When did you arrive at the site on the 28th March 1979?

ILLJES: I arrived at the observation center approximately 2:00 in the afternoon and we were directed to come over approximately 3:30 now these are estimations of time. We got in the control room. We had to put breathing masks on and we were there approximately a quarter to four by the time we got up to the control room.

FASANO: When you got to the control room, who did you report to?

ILLJES: I reported to my shift supervisor, Joseph Chwastyk and he said that he was going to brief us and that we should start finding out infor-

mation, read over the log and get every information that you can before you take the shift, and then he gave us a briefing, along with the foreman, and two other CRO's on my shift.

FASANO: What was your assignment?

ILLJES: I and my partner, John Kidwell, we signed in the log and I took the panel on the primary side and he took the panel on the secondary side of the steam generator. I relieved, Ed Frederick was the last one to sign in the book, and I relieved him at, I think it was about 6:(0, or 1800 that evening when I finally got turned over and I noticed that there weren't all that many entries from the time in the morning. There was a person taking data and I think we gave the log book to him to try and ratch up with it what data he had. Then my specific duties. We looked over the panel. My shift supervisor, we discussed where we were and what we wanted to do if we were trying to collapse the bubbles in the loops in the top of the vessel. We were doing this by raising pressure approximately 2200-2300 pounds.

FASANO: This was at what time?

ILLJES: This was approximately between, somewhere around 1800. We also, at that time, we started, we pumped the reactor coolant pump and then we started, I believe it was the ZA reactor coolant pump, and we kept it on the line. We had flow indication. We saw temperatures equalizing out and we also saw thermocouple temperatures coming down, which is all an indica-

tion of flow being restored. We still had our high pressure injection going on, I believe it was throttled at the time. The exact temperatures of some of the things I don't remember, but they were in the neighborhood of about 500 and some degrees. I am not sure of the specific temperature then as far as the reactor coolant system is concerned.

FASANO: So you came in about 3:45 into the control room.

ILLJES: Approximately

<u>FASANO</u>: That is when you then were briefed on the situation. Any particular, was there anything that you were told specifically as to what was, in other words, the condition at best? Who was telling you the various conditions?

ILLJES: My shift supervisor, Joe Chwastyk, he briefed us of the conditions and the control room operator I talked to, along with Ed Frederick. It was hard to talk to him at the time. We were in air breathing masks for a while. I know when we got out of them, I can't remember what time, but I talked to Mark Coleman and I'm not sure, I believe they pumped a pump once before while we were there, but we were not watching, I'm not sure. Pressure conditions when we started the pump? We dropped pressure down to 1200 pounds or something like that, and then we restored pressure back again after the temperature is equalized.

FASANO: What time did you actually take over the console?

ILLJES: I think the log says around 1820, or somewhere in 1800.

FASANO: O.K. So it was close to 6:30?

ILLJES: Right. 6:30 p.m.

FASANO: You actually started to manipulate approximately 12.5 minutes and when you go back again, when you just got to the control room, how did it appear to you? How were things being conducted?

ILLJES: Well, the shift supervisor was running it. He was at the console and he was directing each and every move of the control room operator, and that's the way we operated more or less the same way. Anything that we did, any recommendations that we did, went through the shift supervisor.

FASANO: This was Mr. Zewe at the time, when you came in?

ILLJES: When we came in, I believe Joe Chwastyk had relieved Bill Zewe. He was directing our operations at the time.

FASANO: Let's see. The primary, you were on the primary?

ILLJES: The primary side. We were taking care of the reactor coolant pumps, pressurizer, make up system. That's the left hand side of the console.

FASANO: That would be close to the reactor building, wide range-narrow range indication?

ILLJES: Correct, correct.

<u>FASANO:</u> Do you recall being briefed on the wide range-narrow range reactor building indications?

ILLJES: I was told that they had a spike on both indications of the reactor building pressure recorder. There was some discussions as to what it was.

A hydrogen explosion was discussed. This was later on in the evening.

FASANO: How late in the evening?

ILLJES: Oh my.

FASANO: You took the controls at 6?

ILLJES: At 6. Well....

FASANO: 6:20 or so?

ILLJES: No, I would say it was more... It was later cause we were... It was after we drew a bubble. O.K. If I want to relate it, I would say it was after we drew the bubble in the pressurizer which we did after that.

As far as what time that was mentioned, as far as we discussed it, I know it was discussed when we turned over, when we came in, but we didn't make any bones about it because we were interested in getting flow through the reactor and the bubble in the pressurizer and so. They had recovered from the building isolation high pressure injection. They had recovered from that situation, and our concern was cooling the reactor and insuring it had flow. Later on when we had things stablized, we had a bubble in the pressurizer and had a reactor coolant pump running and that term area, we were discussing with, I can't remember if it was one of our engineers. But we did have a pressure spike. We pulled it out and I don't know who wanted a copy but we made a couple copies of the chart.

FASANO: O.K. This was sometime after 6?

ILLJES: Somewhere.... Hell, I would say it was after 8:00.

FASANO: After 8:00 that night?

ILLJES: Yea, I'd say it was if I had to put a time on it.

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FASANO: Let's go back a bit. When you first came in, where there xerox copies of that at that time?

ILLJES: I don't know.

FASANO: You didn't see any?

ILLJES: I didn't see any.

<u>FASANO:</u> Discussion was not really centered on that? Or was it centered on that to any degree that you remember?

ILLJES: No, it wasn't centered on that.

FASANO: As far as the ...?

ILLJES: It was over.

FASANO: Were you there when they were talking about it?

ILLJES: Not when I came in. I was there and I wasn't involved in any discussion until it was brought up... Except when it was turned over it was mentioned that we did have a pressure spike, when we turned over. That was the only thing that was mentioned, and that they had recovered from reactor building isolation.

FASANO: So a pressure spike was discussed at the turn over, when you first came in, about 3:45. And then somewhere about 8:00 further discussion and also xerox copies?

ILLJES: Right.

FASANO: And apparently...

ILLJES: I think we remembered the xerox machine wasn't working too good

FASANO: At this time you discussed what and with whom, if you can remember?

ILLJES: We talked, I talked about it with the trainee on our shift, who was Chuck Mell. And the person that asked for the information, and I don't remember who that was, whether it was an NRC inspector or a B&W representative.

FASANO: Was any discussion related to this? Was the hydrogen burn or was a real spike or was this discussed as an electrical spurious signal possibly?

ILLJES: This was discussed that evening but we also talked about it several times after that and I cannot separate the two different discussions but as far as I remember we related it to a cycling of the electromatic relief isolation, which is a DC operated valve I believe and that has a contact in there which will cause arcing which possibly could ignite the hydrogen.

That was discussed, but I can't say we discussed it that night. We didn't really have that much time to do a lot of discussion, but we talked about it and when I walked away from the panel, the guy that wanted the copy, you know, he wanted it now, and I had to walk away from the panel to make sure that the other guy, my shift supervisor, was there while I walked away so...

FASANO: On the first evening, can you recall if on that first evening you were discussing after 8:00 that it was possibly a hydrogen burn?

ILLJES: As far as I know that possibility was discussed that evening.

FASANO: With this engineer, you don't know whether he was GPU or NRC or what? Can you recall?

ILLJES: No, I won't say. I don't remember. No. We... It was also that night, you know, that we determined that we had a hard bubble and what that bubble was, you know, we had talked about that too, you know... What is the gas and is it hydrogen or other and all that water that went through the reactor and out into the RC drain tank and out into the reactor building.

FASANO: So at that time it appeared to be still inconclusive within your own ...?

ILLJES: I wasn't sure that's what it was, personally, yes. I'll say that.

<u>FASANO:</u> On your training... Let's get off the subject here. You took over controls in this situation and, how did your training, did it relate to what you had to do, or was this a completely new situation to you or just how did your training background assist you in performing your assignments?

ILLJES: As far as having a bubble in more than one location, we never ... let's see. I don't remember discussing it in training. I know it's, we had dropped the loops into the pressurizer before during the testing program. This was done, I think there was a time we had resin in our cooling system and we secured reactor cool at pumps and we were in the process of dropping pressure and in order to cool the pressurizer and a little more quicker than what we were experiencing. It would have taken several days to cool down right and so they wanted to speed it up, we dropped the hot legs down and filled the pressurizer by ... I'm trying to think how that went, that's two years ago.

<u>FASANO:</u> So you were on shift when you lost a level on the pressurizer. Is that what you're saying?

ILLJES: We didn't lose level. We went solid, we didn't go solid, but we go in solid in the pressurizer and it was above 400 inches and we were in the process of getting on decay heat system and we were depressurized or in the process of getting depressuirzed.

FASANO: In general, how do you rate your training? B&W simulators, ... etc.

ILLJES: That's good experience down there. That's top notch. The more I can go down there, the more I can work the controls down there and I feel that's real good. I cold licensed and the training that I received during cold license, I also say that was good. I found no problem as far as questions that were asked and some of the examinations I took, with the NRC examination, and with the oral from the NRC, I didn't feel I had any problem. Sometimes in between the yearly exams I would like to see a little more... you know. I think that a lot of that's left up to you, and maybe the license bonus is saying "Well, that's your responsibility and you have to pick your information up". Well they specify what you have to know for the whole range of subjects which you need to know to pass examination and to be cognizant of the operations in the control room. You get an annual oral examination and a 8-hour written exam.

FASANO: These written exams, these are within your own training group, right?

ILLJES: Yea. They are written by one of the training, licensed training personnel, who is, holds a license on Unit 1, I believe.

FASANO: O.K. You do perform surveillance procedures?

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FASANO: Are you familiar with the surveillance procedure on the emergency feedwater system?

ILLJES: We have performed that surveillance, I think a few times. I remember performing it more than once.

FASANO: Do you recall ever seeing the 12 valves in the closed position simultaneously and then left that way while you were in a mode of operation requiring it to be opened?

ILLJES: I think they were left closed during that surveillance. Both of them. Yea.

FASANO: Then after the surveillance they were ...?

ILLJES: They were reopened.

ILLJES: Yes, I do.

Do you have a turnover sheet or check sheet when you come in to the control room to really look over the control board and see just the status of various valves or pumps?

ILLJES: Major valves out of position are normally left on a turnover sheet. The turnover sheet is not a company directive. It's done by the

operators and we list all the major abnormalities that occur between shift to shift. And you're also required to review the log from the previous time that you have been on shift to get what has occurred since the last time you were at the control panel.

FASANO: So, I gather you don't have a formal check sheet.

ILLJES: No, it's not formal.

<u>FASANO:</u> In connection with your training. Have you ever been provided transcripts or recordings of previous NRC walkthrough oral exams?

ILLJES: Previous exams. In other words written exams,

FASANO: Previous exams? By whom?

ILLJES: There are xerox copy.

FASANO: O.K.

RESNER: Who gave you those copies?

ILLJES: I don't remember who specifically provided the copies.

<u>RESNER:</u> Do you have an idea who generally provides those things?

ILLJES: I have an idea, but I take it they come from the training department. I'm not sure that's where they come from. They are used as a, you can only make so many decent questions, and used as a help to study for an exam. I haven't seen an exam. You know, there are some questions that you see from one exam that are on another exam, but those are always pertinent questions to the operation of the power plant. They were something good to study from.

RESNER: At this point we are going to turn the tape over. The time now is 4:10 p.m., Eastern Daylight Time.

RESNER: This is a continuation of the interview with Mr. Theodore Illjes. The time now is 4:12 p.m., Eastern Daylight Time.

FASANO: Going back to surveillance procedure, and in particular the emergency feedwater, does a minimum flow exist to the once through steam generator upon actuation of the emergency feed pumps prior to movement of the 11A and 11B valve, say when it actually actuates?

ILLJES: The 11A valve is a, in other words, when it actually actuates, you have to wait till level gets down to the low level limit and then it will control on the low level limit which is approximately 30 inches in the start up range. The recirc ... there is a recirc, and that recircs either to the condenser or to the condensate storage tanks.

FASANO: Sc, until the limit, 30 inches or so, is reached, the 11A and 11B are seated and then at 30 inches or so, they start to move?

ILLJES: Then they start to control open, but you can't see that.

FASANO: So there is no minimum flow, even at the initiation of a pump? Is there any leakage flow?

ILLJES: There might be some leakage.

FASANO: I mean purpose... purposely?

ILLJES: Not that I know of. Just for pump cooling there is a recirc path to the condenser or to the storage tank. Not to the steam generators.
There might be some leakage as far as I know.

FASANO: Back to training a little. Do you get your ... I mean your training here onsite, do you go over any of the trips, any of the transients as you see them?

ILLJES: Yea, we discuss those. In fact, we take some of the incidents that we get from the NRC, I guess they call it the Clearinghouse Reports, and we go over them and I think when we were in Lynchburg we went over a couple of trips down there that they set up for us at our request.

FASANO: Of your own, Three Mile Island 2?

ILLJES: Of 1. I think it was Unit ?, because the last time I was down we were just starting up and we didn't have any major trips.

<u>FASANO:</u> Since up here at Three Mile Island 2, do you go over the transients formally? I mean, it sounded like you go over them.

ILLJES: Yea. We have a training week, every six weeks. And during that training week usually one of the topics for licensed operators is to go over the trips of other power plants and the incidents of other power plants.

FASANO: How about your own?

ILLJES: .

FASANO: 0.K. On training again, back to a previous question. Are you aware of the existence of transcripts or tapes of actual orals that were given by the NRC?

ILLJES: Actual orals? No, I've never seen a transcript of an oral of an NRC

FASANO: Or a tape?

ILLJES: A tape? No. Never had a tape, just the written exam, or what looked like to be a written exam.

FASANO: At this point we would like to let you, if you would like to express something that you have learned or what you learned from this experience that could be useful in the future for others so that both the NRC and the utilities can do a better job? Or have you any suggestions for the design of a plant, what would make your job easier and so that we can have safer use of nuclear power?

<u>ILLJES</u>: Yea, there is quite a few things that I have thought about and if you want to get down to the, what I think the major cause of the accident is, is the electromatic relief valve. Indication on that is awful shaky, or is not what it should be.

FASANO: Not what it should be? In particular?

ILLJES: Well, it gives you... It has a solenoid operated affair which accepts a pilot stem, or allows the pilot stem to move up and the indication you have is when that solenoid is actuated and that gives you a red light. That doesn't indicate that the valve is open. So you can deenergize the solenoid and the valve can stay open and you have no indication. Some pople may say, well, you have a temperature detector. Well, if it

popped once, that pipe is going to stay hot for a good while, so what would be nice is a positive position indicator of the electromatic relief, or either that or get rid of it. But it's nice to have sometimes. Maybe some better flow indication, downstream of the relief valve, on other relief valves. The major part of the instrumentation in the reactor building, something ought to be done with that, as far as raising it up off the floor if something like this happens again. Getting back to the pressurizer, I think where the relief valves go into a quench tank, most people call it a quench tank. Here we call it the RC drain tank. It's not really a quench tank in my mind, cause it's kind of small. If it was a lot larger and had a little more capacity for cooling, I think we'd have made out somewhat better. As far as getting into some of the other aspects on the steam generators and the steam system, I would like to see some flow indication for emergency feedwater, a valve position indicator for the ll's, in fact, every major valve in the control room I know it's possible, but it would cost a lot of money, and probably that where in power plants, that's the root of all evil, the money involved.

RESNER: Could you elaborate on that?

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ILLJES: Well, it costs money to put some of this instrumentation and controls and you probably have three to four grades of equipment and you buy what will do the job for you.

<u>RESNER:</u> What's your perception of the equipment provided at this particular unit?

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ILLJES: Well, it did its job. We could operate without too much problem. Yes, we know we did have an accident, and at the time of the accident we still had a means of indication there of possibly of determining the accident, but I think you had to have quite a bit of experience in order to see that, and relating to the temperature of the pressurizer versus the pressure in the system and to relate saturation temperature in that manner, you know, determining that you have a large leak in the pressurizer with the electromatic being open. That, like I say, that would take somewhat more experience and, you're looking at everything else and to pick that right out, that's probably a little tougher than the average operator could pick out. Getting back to other equipment. The primary side, I think most of that equipment, you know, is accepted by the industry. They use a pretty well ..., you know it's QC'd and a lot of it is all equal, mostly proven stuff. But the secondary side, I think we could have seen some improvement in the equipment that we did use. Well, that was shown in such things as the steam generator relief valve, main steam relief valves. I guess, our polishing system. I guess I could go on there, but ... as far as other things that I would like to see changed? Getting back to the valves, I would like to see the position of all the major valves placed on the computer. You can call out, maybe as a surveillance, the position of all major valves in the plant. We do that with a lot of other things, like we can punch out all the alarms that are current and that would not be too much trouble to punch out all the valves

that are, say, out of position. Possibly some more indication in the reactor building of what's going on, maybe a TV camera. Some vents could be strategically located which we can recover, say, if we did experience gas into the primary system hot legs in the top of the reactor vessel and could be vented into either the reactor building or it could be contained or into a tank. Probably could use some equipment in the reactor building, such as a detect what's going on, such as a hydrogen detectors or explosive gas detectors, TV cameras, all those things would be nice.

<u>FASANO:</u> You mentioned the tail pipe, the pressurizer piping where you have your exhaust from the electromatic relief and also the safety valves. You say once that pipe gets hot, can you tell what valve is leaking of the three valves?

ILLJES: Yea. There's three separate temperature detectors, I think they're strapped on to the pipe. So you can tell which relief valve is lifting, but it is all in the, its common, so whether it can backfeed into that, I don't think it ... you'd see the biggest change. Right now, say, if you have leakage on our electromatic, which we did have a small amount of leakage, you could ... that was the hottest and it didn't affect...

FASANO: You did look at these temperatures and it appeared to you that it was the electromatic? The electromatic was the one as far as your review of the information available, was the leaking valve?

ILLJES: As far as I... Yes. That was the week ... as far ... At what
period?

<u>FASANO:</u> Well, how long has this been leaking? How long has the pressurizer been leaking?

ILLJES: I believe it started on a trip, I can't remember exactly.

FASANO: One month? Two months? Three months?

ILLJES: Three, four months, I'd say.

 $\overline{\text{FASANO}}$ : To the best of your knowledge, it was always the electromatic that was the one with some suspicion, possibly of others?

ILLJES: Uh, some suspicion of the others. It is a possibility the others could have been leaking also. You noticed some temperature change.

FASANO: That's why I asked you if indeed you can distinguish from one valve to the other.

ILLJES: Oh yes, I'd say you can, but once you have lifted all three and
you ... O.K.

FASANO: Prior to lifting?

ILLJES: Prior to lifting, yes. You can distinguish which one is leaking.

<u>FASANO:</u> You mentioned the reactor coolant drain tank. This unit, as far as the control room, where is the indications for this particular system located?

ILLJES: I wish you wouldn't ask that question. It's around the back of the, if you're facing the front of the console, it's back behind the indication for the substation, our 500 KV substation, facing the west wall of the control room. Yea. There is an alarm on it, and when you push the front panel alarm to clear it doesn't clear that alarm. You have to go back around to silence that alarm, but if you have another alarm at the same time there is a possiblity that you could miss that alarm.

FASANO: 0.K. I don't have any further questions at this time, Mark. Do you?

<u>RESNER:</u> No further questions. A few clerical things for the benefit of the typist. Digress back to the early part of the interview, you referred to a trainee that you spoke with, Chuck Mell. Could you spell that for the record, please.

ILLJES: Yes. Charles Mell.

RESNER: Thank you. Also, the name Chwastyk. Is that spelled Chwastyk?

ILLJES: Right. Correct.

RESNER: At this time we will conclude the interview. It is now 4:29 p.m. Eastern Daylight Time. We thank you very much for sharing your time with us and if you think of anything, please feel free to contact us.

ILLJES: O.K.