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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of:

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COMMISSION MEETING

DISCUSSION AND POSSIBLE VOTE ON
FULL POWER OPERATING LICENSE FOR McGUIRE 2

PUBLIC MEETING

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NUCLEAR REGULATORY COMMISSION

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FULL POWER OPERATING LICENSE

FOR McGUIRE 2

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PUBLIC MEETING

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Nuclear Regulatory Commission
Commissioners' Conference Room
11th Floor
1717 "H" Street, N.W.
Washington, D. C.

Friday, May 27, 1983

The Commission met in open session, pursuant to notice, at 10:02 o'clock a.m., NUNZIO J. PALLADINO, Chairman of the Commission, presiding.

COMMISSIONERS PRESENT:

NUNZIO J. PALLADINO, Chairman of the Commission
VICTOR GILINSKY, Member of the Commission
JOHN F. AHEARNE, Member of the Commission
THOMAS ROBERTS, Member of the Commission
JAMES K. ASSELSTINE, Member of the Commission

STAFF AND PRESENTERS SEATED AT COMMISSION TABLE:

S. CHILK
H. DENTON
J. ZERBE
S. TRUBATCH
B. PURPLE
. ADENSAM
E. CHRISTENBURY
G. TOMAN
D. LEWIS

AUDIENCE SPEAKERS:

R. MATTSON
Z. ZUDANS
V. NOONAN
D. EISENHUT
J. CLIFFORD
R. LAGRANGE
G. A. COPP
H. B. TUCKER

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P R O C E E D I N G S

CHAIRMAN PALLADINO: Good morning, ladies and gentlemen. We are meeting this morning to have the staff brief the Commission regarding the full power authorization of the MaGuire 2 facility.

The low power license was issued on March 3, 1983 and low power testing has been completed by the licensee. It is my understanding that the licensee can commence operation above five percent as soon as authorization is received from the NRC.

At the conclusion of today's meeting, I will be asking the Commissioners to vote on whether to allow the staff to issue a full power authorization.

Do any other Commissioners have additional remarks before we begin?

(No response.)

CHAIRMAN PALLADINO: If not, I will turn the meeting over to Mr. Denton.

MR. DENTON: Thank you, Mr. Chairman. I have with me this morning Bob Purple who will make the presentation and on his right is Dick Lewis representing Region II.

MR. PURPLE: He was on my right.

MR. DENTON: He moved. He is in the audience. Eleanor Adensam on my left is the branch chief for this project. We also have with us this morning our consultants

from the Franklin Research Center and you may recall that they briefed you on their review of the breakers at Salem. They have done a comparable review on the Westinghouse DS-416 breakers that have been installed in McGuire 2 and in McGuire 1.

You reviewed the design of this plant back when you approved the design and operation of Unit 1. Unit 2 is essentially the same design and what our presentation today will focus on are a few new developments that have occurred since your review of Unit 1 at the same site.

CHAIRMAN PALLADINO: May I ask you one question? Is the hydrogen control system for Unit 2 the same as Unit 1?

MR. DENTON: Yes, it is. There have been several meetings over the years on hydrogen control systems. Originally we looked at Sequoyah hydrogen control system. We looked at Unit 1's hydrogen control system and Sequoyah made some changes in their hydrogen control system. We have done a complete review of the hydrogen control system in Unit 2 which is now identical to Unit 1 and we are satisfied that that one adequately provides a control of hydrogen combusion, also.

CHAIRMAN PALLADINO: Is this hydrogen control system the same as Sequoyah?

MR. DENTON: Not in detail, but it has had the same analysis, the same consultants have been used. It has roughly the same number of igniters. There is a difference in the

design of the system. One may be AC and one may be DC and they were under different voltages, but the staff is equally satisfied with the two. There are minor differences between the two of them.

COMMISSIONER AHEARNE: They use different igniters, don't they?

MR. DENTON: Different igniters. But I think from our point of view, there are differences in the detailed design reflecting the choice of the two utilities with regard to both reliability and engineering preferences, but I think they both do the job.

CHAIRMAN PALLADINO: All right. Thank you.

MR. DENTON: With that, let me turn it over to Bob Purple.

MR. PURPLE: Turn on, I guess, the second viewgraph.

(SLIDE.)

MR. PURPLE: This is an outline of the briefing. I might point to the Commissioners if you have one in front of you that is slightly different than the one that was sent downtown, we found out after we sent the package, that the outline we sent you had some minor differences in it, not substantive.

You will find on this outline we show an EQ bullet because there was an EQ piece of paper in there and we didn't have it on the previous one and one other chart was removed

and there was an item on the earlier outline that we no longer have a chart for but what we will do is very briefly go over the background of the plant and view where the unit is now and its schedule for getting up to full power, go over some selected review items that were of particular interest in the review of this facility either because of the facility or because of the timing of when it is up for license, a very brief note on equipment qualification and then the region will have some words about the experience of the operation of unit 2 so far, and then a staff conclusion.

(SLIDE.)

MR. PURPLE: Of course, the licensee is the Duke Power Company. They are unique in that they perform their own architect/engineer and construction function for not only McGuire but also the Oconee station and are doing it for the Catawba station.

As Harold said, the McGuire 2 plant is identical to the McGuire 1 plant. The McGuire 1 got its OL issued in 1981. The hearing process, what that last line means is that the hearing for Unit 2 was held in conjunction with and was completed with the hearing process for Unit 1.

Next viewgraph, please.

MR. DENTON: I might mention there are no outstanding 2.206 petitions. There are no allegations being reviewed by staff. There are no other lega. proceedings that I am aware

of that need to be considered in connection with this plant.

COMMISSIONER GILINSKY: That is a very unusual and happy state of affairs.

(SLIDE.)

MR. PURPLE: On the status and schedule for McGuire 2, the operating licensee with a limit to not go above five percent power was issued in March of this year, March 3. On the ensuing four or five days, they loaded fuel with initial criticality being on May of this year. They have completed a few days ago what testing they can below five percent.

Their plans would be to continue their start-up testing program at power levels up to 50 percent through the 18th of June. The 18th of June is an estimate of the time when they would anticipate shuting the reactor down to do the steam generator modifications that we will talk about a little bit later.

The steam generator modifications would take them about six weeks through the first of August and at that point, they would be prepared to proceed above 50 percent power.

CHAIRMAN PALLADINO: When did you allow them to go above zero power? I gather you had a limit.

MR. PURPLE: At the time of the failure of certain circuit breakers, reactor protection system circuit breakers, Duke committed to hold Unit 2 at zero power until the staff

had issued its safety evaluation report with respect to the circuit breaker problem at Unit 1. In other words, they agreed to hold Unit 1 down as well as to keep Unit 2 down.

When the staff issued its safety evaluation report which was, I think, May 17, that effectively removed their commitment to keep the unit down at zero power and they have since resumed testing on up to their license limit of five percent.

COMMISSIONER ROBERTS: Are they sitting there waiting on us?

MR. PURPLE: No. To go beyond five, yes, but not up to five. There had been a period of time when we were concerned with the reactor protection system circuit breaker problem that they had committed to keep both units at zero power. That commitment is no longer in effect because we have been satisfied that they don't need to be at zero power.

COMMISSIONER ROBERTS: But they are at five percent now?

MR. PURPLE: That's right. Today's action would be the action that would let them get above five percent.

COMMISSIONER ASSELSTINE: Bob, were there things that the staff was still reviewing that prevented us from having the meeting last week? I gather they would have been prepared to go above five percent about a week ago?

MR. DENTON: I didn't at the time think that they

would be ready to go above five percent today. I had told Mr. Theis that there had been no plant in the U.S. that had gone from the fuel load state to five percent in such a short period and he very proudly told me this morning that they have achieved all the low power testing without the usual problems that are encountered.

So it turns out they would have been ready. At the same time, he indicated that they have enough activity to do. I think you had better ask him whether there has been an actual impact on his plant or not. He is in the audience. I wanted to be sure that we had the circuit breaker issue thoroughly in hand and give our consultants adequate time to review it before coming down and telling you our final recommendation on it. He didn't object to that.

COMMISSIONER ROBERTS: I am not attacking you.

MR. PURPLE: The next viewgraph, please.

(SLIDE.)

MR. PURPLE: We move now to selected review items and go on to the next viewgraph.

(SLIDE.)

MR. PURPLE: Duke committed in the course of responding to the fire protection requirements to provide a standby shut down system which would give an alternate and independent means to get to hot standby that would service both unit 1 and unit 2 that would have its own independent AC

and DC power that is needed to get to hot standby and have its own support system self contained. It is actually located in a separate building from both units.

CHAIRMAN PALLADINO: I didn't understand what you meant by self contained.

MR. PURPLE: It is totally independent of anything else in the plant. It is in a separate facility and a separate building dedicated just to this function with its own diesel generators and switching. If there is more to that than I have understood -- that is what was meant by that.

COMMISSIONER GILINSKY: Could you remind us why that is required?

MR. PURPLE: It is not required. It is a method of satisfying the fire protection requirements. If you can have a standby separate independent standby shut down system, that is a solution compared to other solutions of like separating a lot of wires or putting in a lot of fire barriers and so forth. It is an option that is available through the fire protection regulations and they opted for that option as in their mind, I guess, a better solution than attempting to do a lot of interior work in the plants.

There is an issue of disagreement between the staff and the utility and that is reflected in the last bullet. First of all, we find that their fire protection system and this standby shutdown system is acceptable. There are a couple

of license conditions for things that need to get done. One of those conditions the licensee has at least in part, part of that condition the licensee has appealed our finding and it has to do with respect to the type of instrumentation information that we think this standby shutdown system should have available to it and in particular whether it should have source range neutron flux monitor information available.

We have argued and concluded that it should be available. The licensee has appealed that decision although we have it in as a license condition, we certainly are going to listen to their appeal. They appealed it on March the 31st formally. We plan to be meeting with them and the staff on June 8 to reach some kind of resolution either they will convince us they don't need or --

CHAIRMAN PALLADINO: What is it that is under dispute?

MR. PURPLE: The dispute is whether or not they need in this separate facility indication and a separate meter.

CHAIRMAN PALLADINO: In which separate facility?

MR. PURPLE: The standby shutdown facility in this separate building, whether they need to have indication of source range neutron flux monitor read out. We argue it needs to be there so that we can be assured that they are indeed in shutdown following a big conflagration. They believe they have other means of identifying that they are in shutdown and

don't believe that this is necessary. It is not, I don't think, a major item but it is an item of dispute between us.

COMMISSIONER GILINSKY: The other means being what?

MR. PURPLE: Maybe they had best speak to that or I could ask Roger if he could outline. The question was the other means that they feel they have available to identify that the reactor is in fact in a shutdown condition without this.

MR. MATTSON: Measuring other process variables, Commissioner, like pressure and temperature of the system that they are doing what they are supposed to be doing when the system is shutdown and then you could always take samples of the boron concentration in the primary coolant.

CHAIRMAN PALLADINO: Is the condition now that you will require this instrumentation?

MR. PURPLE: The condition requires the instrumentation. They have appealed that condition. The license as issued would require it to be in place.

COMMISSIONER AHEARNE: When?

MR. PURPLE: At the end of the first refueling outage. I would like to confirm that. Not instantly, it would be one that they would put in.

COMMISSIONER AHEARNE: So you have put in a requirement and they have requested a waiver but there is an intermediate time in which you could reach resolution of that?

MR. PURPLE: Yes, sir. It wouldn't be a hold up item that would hold them down.

CHAIRMAN PALLADINO: The appeal would be to the director of NRR?

MR. PURPLE: That's correct. If need be. It could be resolved at a lower level, but if not resolved it would be up to the director.

(SLIDE.)

MR. PURPLE: Reactor trip breaker issue is the next viewgraph. There are three of four viewgraphs here associated with this. I have a couple of points to make first. On experience with the DS-416 undervoltage trip attachment, the McGuire station uses a Westinghouse undervoltage trip attachment with a label model number DS-416. It is a newer generation model.

(Whereupon, Mr. Denton passed around a model of the previously mentioned breaker.)

MR. PURPLE: It is a newer generation model than the Westinghouse device that was the DB-50 that was at Salem.

COMMISSIONER GILINSKY: Does it look all right?

(Laughter.)

CHAIRMAN PALLADINO: If I know what these tabs are, it is a little heavier. I just don't want that spring to catch my finger.

COMMISSIONER ROBERTS: How many other plants have

type?

MR. PURPLE: Both the Farley stations and the Summer stations use the DS-416 model breaker.

They were tested at McGuire over a period of time from February through March and a number of different kinds of failures did occur. As Harold mentioned earlier, we had asked the Franklin Research Center to help us out in reviewing the history of the failures, the cause of the failures and so forth. They are here today.

I guess this is as good a time as any to let them present the findings that they have reached so far in their evaluation.

MR. DENTON: The units that use this breaker had gone to this prior to the Salem event. Then when we asked everyone to test, we found some problems with this breaker, also, and then we had asked Franklin to do some detailed testing on it.

CHAIRMAN PALLADINO: Before we call on Franklin, did Unit 1 use this?

MR. DENTON: Yes. I think that was in there originally but this one now is an improved model of the same one over what they started with.

CHAIRMAN PALLADINO: Can we relate the experience at unit 1 in any way to the unit 2 design?

MR. DENTON: Yes. I think Franklin could speak to

that. The experience with the original design lead to the improvements that are incorporated into this design.

MR. ZUDANS: Good morning. May name is Zudans and I have with me Gary Toman. He is the expert and I am the summarizer.

(SLIDE.)

MR. ZUDANS: We were asked to do about the similar amount of work on this one as we did on the previous one. We had a limited scope on this one here. The key issue was to review the design as it existed and to attempt to define how this device could potentially fail.

We examined all of the failure modes. They were listed, analyzed, evaluated.

COMMISSIONER GILINSKY: You say evaluated the reported failures. What does that amount to?

MR. ZUDANS: Excuse me. I didn't get your question.

COMMISSIONER GILINSKY: What reported failures are you talking about?

MR. ZUDANS: There were several specific failures. I don't have the whole list of them.

CHAIRMAN PALLADINO: Were these failures in tests or in actual?

MR. DENTON: In response to the bulletin that we sent out after the Salem event, there were reported failures in breakers of this design at McGuire Unit 1 and I think it

failed one out of ten times. Maybe we have someone who can describe it. But the cause of the events that were being reported of this breaker is one reason we had a detailed look at it and there have been some changes made in it and it has been retested.

At this moment I don't remember all the failures that came in in response to that bulletin but that is what led to taking a detailed look at how it was failing.

COMMISSIONER GILINSKY: These were failures in tests subsequent to the bulletin?

MR. DENTON: Yes. They weren't failures in operation and they were not double failures of both systems. Remember the bulletin required certain testing and things to be reported.

Does anyone remember? Maybe Vince Noonan can summarize what came in in response to that bulletin?

MR. NOONAN: My name is Vince Noonan from the Division of Engineering. The types of failures we had in this thing were basically the manufacturing tolerance failures. There was some binding problems associated with close tolerance fits. There were some retaining rings that had slipped out of their groove because the grooves weren't quite wide enough.

Basically it was a manufacturing problem. It wasn't a wear problem like we looked at on a DB-50 type device.

COMMISSIONER GILINSKY: These were all test failures subsequent to the bulletin or in response to the bulletin?

MR. NOONAN: They were all test failures. Actually there was a total of eight failures for this device on the McGuire units to operate, seven on unit 2 and one on unit 1.

MR. PURPLE: There is a record of some failures of these breakers prior to the bulletin going out and we have recorded those in the safety evaluation report.

COMMISSIONER GILINSKY: At McGuire?

MR. PURPLE: At McGuire.

CHAIRMAN PALLADINO: You said these breakers. I thought we were talking about two different models are you lumping them both the same?

If they are new, where do we have experience with these breakers?

MR. NOONAN: The ones we had the problems with right now are at the McGuire station and also the Farley station. Farley had a problem because the way this thing was installed the gap setting between the actual trip device and the lever of trips to breaker was too large.

COMMISSIONER AHEARNE: But, Vince, I think the question was are all the breakers at McGuire 1 and 2 the 416's?

MR. NOONAN: Yes, sir, all 416's.

MR. DENTON: Westinghouse had switched breakers and

there were three or four plants that had the so-called DS-416 breakers installed before the Salem event. This was Farley, Summer and McGuire.

CHAIRMAN PALLADINO: Unit 1 of McGuire.

MR. DENTON: And unit 2 and a number of future plants that Westinghouse has in line all had gone to the 416 breaker. As a result of looking at and responding to the bulletin and looking back at the history of individual breaker failures in this, led to a detailed look to see why was this model 416 failing and that model as Mr. Zudans will address they made some minor changes in it intended to correct the causes of failures that had been observed and has been retested.

So both now unit 1 and unit 2 have new breakers, brand new breakers in them, and they have letters from Westinghouse saying this is appropriate for the service and specifying the maintenance and we have looked at it and we are satisfied that these improvements do address the causes of failures which were seen in this model previously.

But the experience with this new breaker is very limited in that it is just now getting in the plants. Is it the same breaker now in units 1 and 2?

MR. NOONON: Yes, the same in 1 and 2.

MR. DENTON: So they have brand new breakers, the new improved model 416.

CHAIRMAN PALLADINO: Are we discussing the new 416 model?

MR. DENTON: He is going to talk about what he has looked at I would guess on the old ones and the new ones, the 416.

MR. ZUDANS: In principle the design has not been changed. It has just been focussed on differently and adjusted and tuned differently based on the experience that was accumulated during the tests both by Franklin and by the utility. Basically it is the same design except that it is tuned differently. Emphasis is placed where it is needed and as a result, it is a better device.

What we did is we evaluated the failures that existed plus contrived failures. Because of the design we could define certain things that could happen to them should a certain environment exist and those were evaluated as well. As a result of this evaluation, of course, some suggested modifications were made not to the hardware of the design but to the way the hardware was assembled and tuned. It is a sensitive device in the sense that you can make a slight mistune just by introducing some particles in it and make it not function.

COMMISSIONER GILINSKY: That doesn't sound very good I must say.

CHAIRMAN PALLADINO: Are they that sensitive that

just a little bit of --

MR. ZUDANS: You will see why we touched on that sensitivity quite clearly. Gary will explain precisely the details. The point essentially is that a rolling element rolls off the surface and if it just happened to have any kind of a particle of minor dimensions, it acts like a chock and would stop that rolling motion.

That is the criticality of this particular device. It can be stuck easily. It requires to be kept clean but the manner this device is installed guarantees the cleanliness. So this really is not a concern. It is more of a contrived mode of failure rather than real.

MR. DENTON: I think it would help to hear the presentation. In many areas this is a distinct improvement in my mind over the design of the earlier breaker but it does have a failure mechanism mode or two that has been identified that if it were not kept clean it would be important.

But if you look at the breaker, it just looks like a sturdier, more rigidly controlled, less intricate design than the original one.

CHAIRMAN PALLADINO: Are the forces so weak that a little bit of dirt would make a difference?

MR. ZUDANS: Gary will explain the details. It is kind of interesting. You would not notice that kind of a circumstance in the beginning. You can only get a full

understanding of this device when you do lots of testing. In the process of this presentation, Gary will show precisely what I mean by this particular potential failure. It is not a real failure. It never failed that way. It is contrived. We show that it can fail that way and that requires certain precautionary steps to be taken. It has to simply be kept clean. That is all there is to it.

Actually, I finished my talk already. I stated what our conclusions are and how if you can listen to Gary, he will give you specific details and make you better understand what we found.

I don't find anything wrong with the device. There are a lot of precise devices that need to be given proper attention for proper functioning.

CHAIRMAN PALLADINO: Thank you.

MR. DENTON: I should also mention while Gary is coming, we have incorporated in unit 2 the same type of design that went into Salem in which they now have either the shunt or the undervoltage attachment can cause a scram so we are no longer relying just on this breaker. It has also been wired up so that the shunt can also activate the breaker from the reactor protection system.

CHAIRMAN PALLADINO: Does the shunt require power?

MR. DENTON: Yes. There are breakers which take power away from the shunt but we do have the diversity in a

similar manner to what is in place at Salem. Both of these attachments trip the breaker when the reactor protection system calls for a scram.

It is identical in that sense to what is at Salem although it is a different breaker.

COMMISSIONER ASSELSTINE: So the shunt system now is an automatic and diverse system?

MR. DENTON: Let me ask Roger to be sure that I have stated it correctly.

MR. MATTSON: Adding the shunt into the automatic portion means that there are diverse ways to actuate the breaker to remove power to the control rods. It doesn't mean that there is diversity to the breaker. We are also discussing requiring that in the near future for Westinghouse plants, also. That step has not been taken but diversity within the breakers, that is what the shunt provides.

CHAIRMAN PALLADINO: Thank you. Gary.

MR. TOMAN: May I have the second viewgraph, please?

(SLIDE.)

CHAIRMAN PALLADINO: Gary, you might identify yourself for the record.

MR. TOMAN: My name is Gary Toman. I am from Franklin Research Center. The second viewgraph shows the various items with names on it in the device. The trip bar in the upper left hand corner rotates on this device rather

than is being lifted so the trip tab comes up and hits the pin and causes it to rotate. I have my famous models here.

There is a lever on the reset lever. There are two major levers, the reset lever is the one with the major tab going up and the roller bracket is the device in here (indicating on model). This is the reset lever here and the roller bracket is underneath it.

When the circuit breaker opens, a portion of the circuit breaker comes and pulls the reset lever back and causes the device to be reset by having this arm come and pull on the back of the roller bracket.

In the reset position, the roller bearing is underneath the reset lever and is held in place magnetically. The moving core pulls down on the bottom of the roller bracket pivoting at about this point here (indicating on model) keeping the device reset.

When the power to the coil is removed, the device moves like this and the roller moves out from underneath the reset lever. The power spring causes it to flip tripping the circuit breaker. The circuit breaker then resets the device again for the next operation. It goes off in this manner again.

May I have the third slide, please?

(SLIDE.)

MR TOMAN: There were a number of problems found on

test. The first test failure was a clearance problem internal to the device. It was actually traced to two possible areas on the original device. The first area, there was inadequate clearance between the moving core and the bottom of the roller bracket arm. So it bound there preventing this from rotating because of friction here.

The second one was a little more difficult to see on this diagram. There is a shaft through this point. On that shaft is a bushing to help the roller bracket stay in place.

MR. DENTON: Gary, you might mention what you mean by tests. This is a test that was done maybe at McGuire.

MR. TOMAN: The testing was in response to the IE bulletin to separately test the undervoltage trip attachment. During one of those tests, these conditions started to show up. The device failed to operate, did not come off latch, just stayed there, the one that was deenergized. It was traced to one of these two problems at the time. That was inadequate clearance here such that your moving core bound against the bottom of this preventing this giving extra friction here preventing it from rotating. The second failure recognized was a bushing on this shaft here. I have a picture.

This is the roller bracket with the trip lever moved out of the way, the reset lever moved out of the way. This bushing if it is too long will push the roller bracket over

against the frame and act as a break. That was found as a problem in further testing the device. This started to show up where there was friction here from the bushings, the spacer bushing being too long.

Both of those problems have been removed by doing testing after manufacturer to assure 0.018 clearance here and a minimum of 0.030 clearance on the bushing. So those two problems have gone away by closer machining and checking of the device during manufacture.

COMMISSIONER AHEARNE: When you say that they have gone away, what do you mean?

MR. TOMAN: They have been removed in the new devices.

COMMISSIONER AHEARNE: I guess what I am asking is is this the proposed production technique which would eliminate it or are you saying that they have now produced enough runs that enough samples have been taken from those runs to show that yes, they have solved the problem?

MR. TOMAN: In response to the failures, they went and took the McGuire devices, measured them and found out that when compared to the machine drawings as they were supposed to be, the tolerances were off. The clarified the drawings and then made test procedures to go back and verify that the correct tolerances existed on the devices especially for these first two.

CHAIRMAN PALLADINO: The production items, do they contain the right tolerances and are they being adhered to?

MR. TOMAN: When they went back and looked at the drawings for the device, the device was first produced in East Pittsburgh. The production line was then moved to Puerto Rico. When they went back and looked at the machine drawings, it was additive tolerance problems that got them into trouble. They started measuring from a certain point and it was difficult. You had to derive some of the sizes and dimensions for the device.

The drawings for machining the devices have now been changed such that the critical dimensions do not have to be derived. They are directly on the drawings. They have also added production tests. Since the McGuire event all of the undervoltage trip attachments associated with the DS-416's have been changed out or are in the process of being changed out to the newly manufactured ones with these correct clearances on them.

The next failure that was recognized was an interaction between the circuit breaker and the device and it had to do -- may I go back to the second slide, please.

(SLIDE.)

MR. TOMAN: In the upper left we have the trip tab and the trip bar. The issue now is the distance between the trip tab and the trip bar. If it is too close, the device

won't get up its momentum and snap the trip bar off the healthy click. It will come up slowly and possible not knock it off. So you have to have a small gap in there. They recognized that problem early on.

Shortly after, I believe at Farley, they found that there was also a problem possibly of too far away such that you came up, hit it but you then did not have enough travel left to knock it fully off of the circuit breaker latch. That has now been corrected with two tests for the device in the circuit breaker.

One proves that the gap, the initial gap, is wide enough and the second test proves that you have enough extra post-travel to knock the device off its trip, the main circuit breaker off its trip latch, and trip the circuit breaker.

One more failure was recognized during the testing that went on from February on and that was they had just finished working on one of the devices and put it back ready for service and the first time was tried in the circuit breaker. It failed to trip the circuit breaker. It was then recognized that a clip on one of the main shafts had come off and the shaft had slipped out of the frame causing the device to jam. This was traced back again to machine tolerance questions which are manufacture tolerances. The groove that the clip fit in turned out to be too narrow. Therefore, the clip, the C-ring clip, did not drop into the groove. It was

riding up on it and could easily be knocked out of the groove. This has been corrected by widening the groove and having the C-clip fully relax into that groove requiring a much higher force to get it to come off. Before you could get it to come off with fingernails or just push relatively hard with your finger on the shaft. Now it won't do that. It is held in firmly.

So those three problems have been repaired by closer tolerance checks after testing and there was only one real modification to the device and that is the widening of the grooves. The remainder of it is closer machining to more exact dimensions.

During my testing of the device, I found one more potential failure mechanism and that is on sheet four. May I have sheet four, please?

(SLIDE.)

MR. TOMAN: This is the one that Dr. Zudan started discussing earlier. We determined that there was one possible further area for concern. No failures have occurred to date but we found one area of further concern. The energy levels and forces involved in the device make the roller bearing a fairly critical item.

We did find through a contrived test that if you put a small piece of debris on the roller surface just as it goes up underneath the latch and while the bearing moves in that

direction, it rolls in the opposite direction. It will roll a piece of debris up under the reset lever where it hits and act as a chock block. It turns out fortunately the way the circuit breaker is designed and the way its cabinet is designed that trash will not accumulate on it. The only time that you would have to worry about such a failure is if someone during maintenance allowed something to get on the device.

It would be very difficult to do but it is easy to inspect to see if grit or particular matter is laying on the roller bearing surface anywhere. In service, the cabinet it is in is fully sealed. There is no way for cement dust or anything like that to get into the device and in its set up mode, the reset lever actually helps to shield the bearing surface to keep it clean and above that in the circuit breaker is another platform which would also prevent material from dropping into this area.

The only other possible problem associated with the bearing would be an age-related thing, a long term problem. That would be grease possibly drying out or higher frictional forces occurring. It is a roller bearing, a six-pin roller bearing, in that area that might cause degradation with time. Again, neither of these failure modes or potential failure modes have occurred.

COMMISSIONER AHEARNE: It hasn't been in operation

that long?

MR. TOMAN: I now have four in my possession. They were built in 1974, there of them were. I didn't see any of this aging of the grease and make it an immediate concern. The roller bearings on all of them operate correctly. It is a potential area for long term concern of the grease drying out or some failure of the bearing area.

The grit problem can be easily checked for cleanliness following testing and maintenance, a visual check of the bearing surface. During maintenance, you can just see if it is rolling freely.

CHAIRMAN PALLADINO: How much debris do you need? You talked about cement dust.

MR. TOMAN: I managed to get a 0.0025 chock in there, 0.0025 thick. It has to be just in the right spot. It is a relatively low probability thing of happening naturally. The surface is a smooth surface, relatively smooth surface, so it would take a piece of debris with some kind of material to hold it in place, a chunk of material with a heavy grease on it or something like that to hold it so that it would roll up in place as a chock. It is a relatively low, very low probability phenomenon.

CHAIRMAN PALLADINO: What I was getting at is it something big enough that you could see it?

MR. TOMAN: Yes. It would be visible.

CHAIRMAN PALLADINO: It isn't just a speck of dust?

MR. TOMAN: No. Very small level dust, no. It has to be a particle you would be able to see. A relatively careful check would show it by eye without having any magnification.

MR. ZUDANS: Mr. Chairman, it is like a size of a hair.

COMMISSIONER GILINSKY: That doesn't sound so good.

CHAIRMAN PALLADINO: I was picturing something a bit bigger.

COMMISSIONER GILINSKY: I wonder if we might not want to have a session with the manufacturers of these devices sometime in the future.

CHAIRMAN PALLADINO: I think so.

MR. DENTON: I think it argues also for continued action on ATWS rather than relying on a single breaker as we have in the past or redundant breakers. I think we are very near in getting a staff recommendation to you on an approach to ATWS. I think the CRGR has acted on the most recent proposal.

COMMISSIONER GILINSKY: That sounds good but I think we ought to also look into these devices further and talk to the people who make them.

MR. TOMAN: I have a set of conclusions and recommendations concerning further actions.

1B

(SLIDE.)

MR. TOMAN: In our evaluation we determined that the failure modes that were recognized by the licensee and Westinghouse had been corrected. We have had the actual failed devices for evaluation. We had an extra device from Catawba which is a similar generation to the original devices and then we had this modified one. That is the modified one over there.

There are problems with the manufacturer clearances, internal device clearances, external device in the clips, has been corrected. Minimum acceptance criteria for output of the device with respect to the force required to trip the device has also been set.

The acceptance criteria and test methodology for the clearances between the device and internal to the device have also been set.

McGuire performed baseline tests showing that all these clearances were correct on the newly installed devices. None of the former devices exist any longer at McGuire. That is both unit 1 and unit 2.

They have timed the circuit breakers. The timing is correct or within an acceptable range.

For short-term operation, there has been sufficient testing, the modifications to the device does not negate the previous testing of the device. It shows that you can do many

thousands of cycles.

We conclude that the associated roller bearing forces are extremely important to correct operation of the device and a small piece of debris on the surface could act as a chock preventing unlatching. Increased rolling friction could rapidly reduce operating margins. Of course, no such failures have occurred to date.

May I have slide 6?

CHAIRMAN PALLADINO: Have there been any life time limitations placed on these yet?

MR. TOMAN: Not yet. One of my recommendations is that life testing be done.

CHAIRMAN PALLADINO: Was any consideration given to increasing the forces that could overcome modest amounts of debris?

MR. TOMAN: To my knowledge, the manufacturer has not considered that yet or has chosen not to.

(SLIDE.)

MR. TOMAN: Following maintenance, the outer surface of the roller bearing and the mating surface of the reset lever should be inspected for cleanliness. No debris of any kind should left on these surfaces. The roller bearing should be checked for free rotation.

The baseline tests of the UVTA and circuit breaker should be performed periodically and repeated and the

resulting data should be compared to the original baseline data and trended to determine if degradation is occurring.

Life testing of the UVTA should be performed to show that the device can successfully operate for the intended lifetime.

If the intended lifetime is shorter than the life of the plant, that the replacement interval should be developed so that replacement occurs significantly before the expected end of life.

Fifth, the roller bracket to roller bearing frictional forces should be evaluated to determine if probability of failure to operate increases with age of the bearing and grease. This, I expect to be done during this new life testing period so that you can show that there is no such failure mechanism, long term failure mechanism, associated with the bearing.

COMMISSIONER GILINSKY: What sort of period did you have in mind for testing?

MR. TOMAN: On the order of six months for the repeat of the whole testing scenario.

CHAIRMAN PALLADINO: Gary, you have worked with these devices now. Do you have a pretty high degree of confidence in their capability to perform as they are intended to?

MR. TOMAN: Yes. The modified device with the

proper clips and the clearances definitely increases the probability of correct operation. I did have the device with the spacer problem and we could get it to periodically hang up. It acted as a break. That problem went away. We had the device that initially had the clearance problem between the bracket and the moving core and the clearance on that was less than 0.0015 so that was a very high likelihood of a problem there. It is now 0.018. We have gone through it. That area is clean now. It can't jam in that area.

We were worried about the moving core jamming. We have sufficient faith that it will operate correctly for the short term at least and the life testing will prove the long term.

CHAIRMAN PALLADINO: Short term in your mind is what?

MR. TOMAN: Six months to a year range, no doubt.

COMMISSIONER GILINSKY: I must say that I am pleased that the difficulties have been corrected but I am surprised that manufacturers turn out devices that are so sensitive and run into these kinds of problems when they know what they are used for and they understand that it is a critical piece of equipment and they just have not paid sufficient attention to it.

MR. ZUDANS: In my mind that is the most serious concern that ever existed in this device. It is just the

sloppiness that bothers me from the very beginning. Once you pay proper attention to the device and what it is supposed to do and do the things that you would normally do, it becomes a perfect device. Sometimes one must wonder how many such other devices are there around.

CHAIRMAN PALLADINO: That's right. Any more?

MR. TOMAN: No.

CHAIRMAN PALLADINO: Thank you very much.

MR. PURPLE: If we could please go to slide number 10.

(SLIDE.)

MR. PURPLE: I passed by one that is number 9 because Gary has pretty well covered that.

CHAIRMAN PALLADINO: Have the corrective actions on the breakers and procedures been applied to unit 1 as well as unit 2?

MR. PURPLE: Yes, they have. Everything that I am speaking of here will be consistent with unit 1 and unit 2.

COMMISSIONER GILINSKY: Are these going to get applied to all the plants that use these devices?

MR. PURPLE: That use the DS-416, that is correct.

MR. EISENHUT: If I could comment, in fact all of the utilities, all five plants that have the DS-416, have installed the modified UV attachment. We are formalizing the requirements on all those plants with the same package you see

here in the table that you went through, hence, we are basically relying upon the plant evaluation.

COMMISSIONER GILINSKY: Including surveillance frequencies and so on?

MR. EISENHUT: Yes, including surveillance frequencies. We are in fact now formalizing the requirements so that they will be formally put in place on each of the five plants.

MR. DENTON: We used McGuire 2 as the guinea pig to develop it since they were appropriately under review. The others were in operation and we thought that once we decided what should be required here at McGuire 2 for sure, we will make that across the board. But the other ones have kept very closely associated with this and as Darrell said have actually made the changes and we will have to put it in a formal manner into place.

COMMISSIONER ASSELSTINE: Is the frequency of the testing still viewed as an interim measure? I recall both when we had the Salem discussion and looking at the minutes of some of the recent CRGR meetings, there still seems to be an outstanding concern about whether the frequency of testing is contributing to wearing the devices out and is on balance either a positive or a negative thing.

MR. DENTON: Let me answer that two ways. We have approached the testing and the surveillance of this the same way we did at Salem. Now there is a concern that the expected

life time of this is short and frequent testing may be wearing them out. I don't know where the CRGR stands in consideration of that issue.

MR. EISENHUT: As of the last meeting which was just a couple of days ago, it is still a question we had. The testing that is required here remember is on the order of 25 tests at Westinghouse and ten at the plant, a total of 35 tests, and certainly is well down the number which we expect to see when the life tests are done. The life test programs are expected to be completed within the next six months or for enough to have a really good handle on it. We certainly don't expect that the 35 tests are going to run into a problem during that short period of time.

COMMISSIONER GILINSKY: Do you do some kind of a monthly test?

MR. EISENHUT: Yes. There are monthly tests. But 35 initial plus monthly tests over a six month period really don't add up to much compared to the kinds of numbers we have been hearing.

COMMISSIONER GILINSKY: The monthly tests are only over the six month period?

MR. EISENHUT: No.

MR. PURPLE: It would be a life test program that is required to be undertaken, that we anticipate that we will get some results in in about six months. That life test

program may lead to the conclusion that you don't need to do it this often or that you may need to do it more often. But it would be from that that you may change what we are presently putting in place today.

MR. EISENHUT: The key is we are trying to get a definitive answer to this question by life tests for both the DB-50's and the DS-416's. We believe we will have a lot better answer within the next six months, in that kind of time frame. If you look at the additional tests and the change in frequency in testing, it really doesn't amount to that big a number.

COMMISSIONER ASSELSTINE: Over that period of time.

MR. EISENHUT: Over that period of time to the point where you have an answer.

MR. DENTON: We intend to relook at this once we have got a little bit of data from the life test. There is also a concern that just the testing itself has some probability of introducing a spurious scram and that is a challenge to the systems, also.

I think it does make sense that once we have a little more data in hand to revist this whole issue of surveillance testing to be sure we have the optimum interval, but we don't seem at the moment to have arrived at any place other than we have on Salem.

COMMISSIONER GILINSKY: What, in fact, would get

done every month? What would the monthly test amount to?

MR. EISENHUT: It is the test that previously had been a six month test and had moved up and there is now, I think the next slide or something had a standard table that was very similar to what we went through in detail at Westinghouse.

(SLIDE.)

MR. PURPLE: The middle column on that table.

MR. EISENHUT: It is the functional test approach of both the UV devices and the shunt. You will recall that before the Salem event, there was testing of one device something like every 60 days. This is moved up somewhat to a little tighter frequency.

COMMISSIONER GILINSKY: There they were testing the shunt, weren't they?

MR. EISENHUT: They were testing the UV device every 60 days.

COMMISSIONER ASSELSTINE: The shunt was every couple of weeks, wasn't it, or something like that?

COMMISSIONER AHEARNE: The shunt was every seven days.

COMMISSIONER ASSELSTINE: Every seven days, that's right.

MR. EISENHUT: That was only at Salem though. I don't think it was a tech spec requirement. The only one

that was a tech spec requirement was the UV device.

COMMISSIONER ASSELSTINE: But this would now become a tech spec requirement?

MR. EISENHUT: Yes, at McGuire and across the five DS-416 plants.

COMMISSIONER ASSELSTINE: Which means that after the life test program was completed and we got some results that we would have to go back and change the tech spec if it turned out that the frequency level was too frequent.

MR. EISENHUT: And any other plants that would be affected by it. We would hope to do it generically across the board as a generic fix.

In answer to your specific question, there still is quite a bit of debate on the CRGR about it and we believe that it is something that is going to have to be evaluated. We argued it long and hard this last Wednesday. But it is something that we are trying to get a handle on through the life test.

COMMISSIONER ASSELSTINE: Given that, is it best do you think to go ahead and put these things in as a tech spec requirement now or to treat it in some different way that makes it easier to modify later on or is it easy enough to modify it if you do it as a tech spec requirement?

MR. PURPLE: Literally they aren't actually being put in as a technical specification. They are being put in

as a license condition but I am not sure that that makes it any easier than the tech spec. It is a license condition.

COMMISSIONER ASSELSTINE: Sort of take an amendment to the license.

MR. PURLE: It still requires an amendment to the license to remove.

MR. EISENHUT: It is relatively easy to modify and it is the only way. In this day and age, you really only have tech specs and licenses. They all take an amendment and one is equally as difficult as the other or as equally as easy as the other and we certainly have not viewed it as an administrative problem. If we thought we wanted to change it from a safety standpoint, we would order them to do so and be done with it.

CHAIRMAN PALLADINO: Yes, Roger.

MR. MATTSON: There is a little science that has been applied to that question, too. There are some statistics that say when you factor in the time that the equipment is out because you are testing, the wear that you are introducing to the equipment and the fact that you are looking for a low probability event that is giving you something good from the testing, you put all those things into a statistical model and test it, you can tell what the test interval should be to optimize the reliability of a given component that is if you are changing nothing other than the testing.

If it is an unreliable component then you reach a minimum in the curve that says that if you test more frequently than this you decrease its safety and if you test less frequently than this, you will get a decrease in safety. It is a different curve if it is a more reliable component.

Enough work has been done by our Office of Reserach and the Division of Risk Assessment on the testing frequency of breakers since Salem to know that for a component with the reliability of the DB-50 Westinghouse breaker, 31-day testing is more safe than 60-day testing. Yet 31 days is not far enough down to have begun to climb back up the curve where you introduce unreliability because of testing.

For a component like the DS-416 which we think is more reliable than the DB-50, the difference between 60-day testing and 31-day testing, you can't see in the models. It is essentially a flat curve. You are still above the frequency, that is, you are not testing frequently enough to have begun to get unsafe because of the testing.

So the 31 days, we know hasn't introduced a decrease in safety. Whether there is a significant increase in safety for the DS-416, we are still evaluating and the way we intend to handle it generically is to stop doing these analyses ourselves and tell manufacturers to start doing these analyses.

So it may change somewhat because of that in addition to the life cycle testing.

CHAIRMAN PALLADINO: All right. Can we go on?

MR. PURPLE: I would propose we move on the next review item.

COMMISSIONER AHEARNE: I am not sure whether this is the right place to ask an ATWS question but since it related to the breakers, et cetera, I would ask it anyway. In the middle of your SER, you make the point, you say, "Upon recognition of an ATWS event the immediate actions are to trip the reactor manually." That seemed to be a little different from where you came out on Salem in which I thought on Salem it was upon the indication of an automatic scram signal, the operator is supposed to manually trip it. The question of recognition wasn't there.

MR. DENTON: I don't know if we have someone here who can address that or not.

MR. CLIFFORD: Jim Clifford, Division of Human Factors. We had done a pilot monitoring review of McGuire and had gone through on a simulator and observed the McGuire operators going through an ATWS event. This was two or three years ago and observed that the response even recognizing an ATWS using the indications in the control room, their response was very, very rapid. We found that adequate for operator response to an ATWS event.

COMMISSIONER AHEARNE: But that still then seems to leave -- are we saying that we find either approach acceptable?

I thought that in the case of Salem, we were requiring them to do this.

MR. CLIFFORD: Part of the consideration in McGuire's case was they do have the shunt trip installed and their breakers are more reliable than at Salem. It was part of the consideration.

MR. DENTON: I think what the staff came down with here is not quite the same position but very similar and the difference is only two or three seconds.

COMMISSIONER AHEARNE: The difference is the interpretation. In the Salem case this is, as I understand it, in the Salem case as soon as the signal is indicated that it was supposed to automatically trip, the operator is told to also manually trip it. In this case, it says the operator goes through a process of interpretation and when recognizes it was an ATWS event, then manually trips.

MR. DENTON: What I understand the staff's view on McGuire 2 is is that that recognition process can take two or three seconds there based on demonstrated performance and then if it is not tripped, they trip it. That is correct.

MR. CLIFFORD: Part of what we observed at Salem was the operator is willing to take a long time to look at indications. What they are using at McGuire is reactor power and rod position which is a very rapid recognition.

COMMISSIONER AHEARNE: I understand your justification

that you are giving me. I am just trying to point out that when you say it only takes two or three seconds, they can do this. It is different than saying that if it is not done in two or three seconds, then they should manually trip it. I just think that there is a somewhat inconsistent position and I was trying to understand the rationale.

MR. DENTON: There is a difference in this one. That is the one that the people assigned to McGuire came to and there were a little different people who were assigned to Salem. It is a question of whether you want to have it identical in all places.

COMMISSIONER AHEARNE: I was just trying to understand where the NRC was.

COMMISSIONER GILINSKY: Why wouldn't you want it identical in all places?

MR. DENTON: It goes back to this argument of standardization. McGuire has had a simulator in operation for many years.

COMMISSIONER GILINSKY: I am not saying that their way isn't right. I am just asking why wouldn't you want it identical.

MR. EISENHUT: Harold, maybe I could add one comment here. There clearly is a difference between the positions. It is something that is still evolving on the staff. We are trying to reach resolution on the best technical way to go.

There are two sides to the argument. I think even within the Division of Human Factors there are two camps as to the position. But we think on the package for McGuire, we think is an acceptable way to go just as we thought that the package on Salem was at this time.

MR. DENTON: Let me ask the Commission. If you want it identical in all plants, we can do that.

COMMISSIONER GILINSKY: I don't think it is something that we can solve right here.

MR. DENTON: My discriminator on this issue was that both of them were acceptable and people had strong arguments why for each plant it was fine there. They are not quite the same. But when you look at the details and I wanted to explain, McGuire has a simulator. They have been able to train their operators for many years and based on those people, the people who looked at that, felt that the two or three seconds that they have shown down there they need to recognize that that was acceptable whereas at Salem, they should do it immediately.

I didn't think that trying to fine tune the system if they are running McGuire this way and the operator seemed to work, I accept that there. We thought something different was appropriate at Salem rather than having the same position on it. It is very close to being the same but it is different. I think it goes back to the lack of standardization among

plants and do we want to force all of them to do it exactly the same way in all aspects.

CHAIRMAN PALLADINO: If the Commission wants to hear any more about this, we can bring it to your attention.

COMMISSIONER ASSELSTINE: I have one more question before we leave breakers. On page 1-3 of Supplement 7 to the SER which is the chart on breaker testing and maintenance, the third from the last item on the right hand column says, "Servicing/lubrication/adjustment in accordance with manufacturers recommendations." Wouldn't it better to formulate that in terms of the licensee submitting a program or a plan for servicing, lubrication and adjustment rather than just strictly tying them in to manufacturers recommendations?

I wonder whether the manufacturer in all cases is going to gear that program to what needs to be done rather than the interest the manufacturer might have in terms of warranties or whatever.

COMMISSIONER GILINSKY: Or to put it more bluntly, it puts the plant at the mercy of a lot of manufacturers.

COMMISSIONER ASSELSTINE: That's right. I just struck me that that formulation was somewhat unusual rather than saying to the licensee you come in with a plan on that which may well be the manufacturers.

MR. DENTON: I think I would agree with that. If it is different than the manufacturers, we want to understand

it but the requirements should be on the licensee.

MR. PURPLE: I think it really stemmed from the fact that we had occasions before where such procedures were not even followed. That was bothersome -- not on this plant but on others.

COMMISSIONER GILINSKY: I think it is awkward to require them to follow whatever they were told.

COMMISSIONER ASSELSTINE: I would suggest reformulating that particularly since I gather that that is a license condition.

MR. PURPLE: Yes, it is.

CHAIRMAN PALLADINO: Are you leaving slide 10?

MR. PURPLE: I was going to leave slide 10 and 11 but whenever you are ready.

CHAIRMAN PALLADINO: Can I ask you a question on that?

MR. PURPLE: Of course.

CHAIRMAN PALLADINO: Duke Power at Ocone was cited as having very good procedures on post-trip analysis and here at McGuire you say, "upgrade required." What causes the difference in point of view?

MR. PURPLE: I don't think there was a difference of view. What this really is is a license condition that says within 60 days after you get the license come in with a review of what you are doing, upgrade them if they need upgrading,

explain why they are all right and submit them to us for review. It is nothing that I don't believe we have identified in the explicit things that need upgrading right away. That bullet was to identify the condition that we wanted them to take the time to go relook at it.

CHAIRMAN PALLADINO: Do you normally look in that amount of detail?

MR. PURPLE: On reactor trip breakers, in the last two or three months, yes.

MR. DENTON: No, we don't.

MR. PURPLE: But not normally on everything.

COMMISSIONER AHEARNE: I gather from your comment in the SER that the McGuire and Ocone procedures are different, is that correct?

MR. PURPLE: I believe that is correct.

MS. ADENSAM: Yes.

COMMISSIONER GILINSKY: When I was down there they took some umbrage at the comparisons that have been made here. The people at McGuire did in any event.

MR. DENTON: The intent of this was to get their unit 2 procedures reviewed against today's approach. Do you want to discuss the differences?

CHAIRMAN PALLADINO: No. My question was Duke at Ocone was cited as having an exemplary post-trip review process. Now this one says you have to upgrade it and I was

wondering whether there was some degree of continuity in this.

COMMISSIONER AHEARNE: It even says in here that the licensee should review and consider adopting the Ocone procedure.

CHAIRMAN PALLADINO: Roger, do you have a comment?

MR. MATTSON: If you are satisfied with that status of knowledge, I don't want to muddy the waters.

(Laughter.)

MR. MATTSON: It sounded when I stood up like you needed some help, but I think you have gotten to the right position. In our judgment, they are different despite some things that Commissioner Gilinsky seems to have been told. At least in what has been supplied to the staff, there is a significant difference between Ocone and McGuire and we are giving them 60 days to take a look at what they have at McGuire and come back and talk to us.

We did say Ocone was exemplary but we didn't say that they were adequate. There is a difference.

(Laughter.)

MR. MATTSON: When everybody else has nothing and Ocone has something, they are exemplary. There is a difference between that distinction and the distinction between adequate and inadequate.

COMMISSIONER AHEARNE: Next step. You are then for leaving us with the conclusion that Ocone is inadequate or

that you are not yet sure?

MR. MATTSON: We can improve on Ocone, yes, sir.

COMMISSIONER AHEARNE: But is Ocone adequate?

MR. MATTSON: We haven't set a standard yet and that is why I don't know.

COMMISSIONER AHEARNE: All right.

CHAIRMAN PALLADINO: I get the feeling that Ocone is up here and McGuire is not quite up there but when it gets up there we are not sure whether it is adequate.

COMMISSIONER AHEARNE: That's right.

MR. PURPLE: But it would be exemplary.

COMMISSIONER AHEARNE: If it got up there, it would no longer be exemplary.

MR. MATTSON: It never hurts to have a guinea pig and some people who are sitting in plants with real operating problems some example for other people to follow. I think that McGuire will graciously help us in this area. We know that Duke did well at Ocone and our development of standards is occurring at about this time with generic criteria following Salem and I think these people can probably help us if they come in in 60 days and tell us why they think at McGuire they ought to have something like Ocone, maybe different, maybe better, maybe not quite the same thing and we will work with them.

CHAIRMAN PALLADINO: I am gratified that you are

looking into it. Can we go on?

MR. PURPLE: I am perfectly happy to move on to steam generators if you all are.

CHAIRMAN PALLADINO: Yes, we are.

(SLIDE.)

MR. PURPLE: I think we have already touched on this briefly. The steam generator situation at McGuire 2 is the same as it is at McGuire 1 and at the Summer station. At the present time the license even if given the 100 percent approval authorization today by the Commission and by the staff, it has in it a condition and the "will be" on this viewgraph if it says "will be" should be "is." The power operation is restricted to 50 percent by a present license condition until the modifications are completed which they plan to do starting in just a few weeks from now.

The modifications which we talked about earlier on are identical to those that were completed for unit 1 in May of 1983.

COMMISSIONER AHEARNE: That is this one?

MR. PURPLE: Yes. They have been completed in unit 1 this month.

COMMISSIONER GILINSKY: That was the first unit which was modified, is that right?

MR. DENTON: Yes.

MR. PURPLE: They and Summer.

COMMISSIONER GILINSKY: Summer has been modified?

MR. PURPLE: Yes. Both Summer and McGuire 1 have been modified.

MR. DENTON: No plant in the world yet has reached full power with the modification. The first plant will either be Summer or McGuire.

COMMISSIONER GILINSKY: I am a bit surprised that people don't want and see how the first one works out. They seem awfully confident and I hope it is right.

MR. DENTON: This modification was based I understand on full scale hydraulic testing. It is the basis for their confidence. But none of the three foreign reactors that have made this modification have gotten back in high power operation. I think in the U.S., Summer is going up in power. McGuire is going up. Both are instrumented. The actual validation of this vibration has been corrected will depend on how the plant performs.

MR. PURPLE: We do anticipate that McGuire 1, I think it is in the order of about six months, would be shutting down in any event to look at how it has behaved so that any other reactor wouldn't have run any longer than that and if the modification from a safety viewpoint wasn't good, we would certainly have time to take appropriate action. If it turned out it wasn't a good modification, it wouldn't be a good economical design.

COMMISSIONER GILINSKY: Quite apart from safety, I guess I am a little surprised that they are all being put in at once. I hope they are right.

MR. PURPLE: They had confidence, I guess.

That is all I meant to mention to the steam generator issue. May I have the hydrogen mitigation chart?

COMMISSIONER GILINSKY: Let me just go back to the earlier point when we were talking about Ocone versus McGuire. I guess the big difference is that Ocone has some procedure that requires them to go to cold shutdown if within some period they can't identify the cause of the trip. Is that right?

MR. MATTSON: It is our reading of their procedures and we have been told by representatives from Ocone that that is their standard practice, yes, sir.

COMMISSIONER GILINSKY: How do they ever get out of cold shutdown if they don't identify the cause?

MR. MATTSON: I guess you would have to ask them. I don't know that they have ever been in that situation. I assume they bring a lot of attention to evaluating the condition of the plant if they are in a condition of cold shutdown because they can't identify a source of a trip.

COMMISSIONER GILINSKY: That is the aspect of the Ocone procedure that you think McGuire ought to be looking at.

MR. MATTSON: That is one aspect. There is another

aspect. We were provided with the Ocone procedures a rather detailed check list of the condition and response of the plant to the trip. We have not been shown that that checklist exists at all in the case of the McGuire restart proceeding.

COMMISSIONER GILINSKY: Thank you.

CHAIRMAN PALLADINO: Can we go on?

(SLIDE.)

MR. PURPLE: The hydrogen mitigation system, we have also talked about earlier. I don't think there is anything new on this chart that we haven't talked to except in detail that there are some license conditions put into the present amendment that would authorize full power and they are detailed on that viewgraph. Otherwise, the staff has finished its review of the hydrogen mitigation system for McGuire units 1 and 2 and concluded that it is an adequate system.

CHAIRMAN PALLADINO: Do I understand now that this can be or will be capable of being operated from the control room?

MR. PURPLE: That is the last bullet on the viewgraph and that is listed at system actuation in the control room meaning that you can turn it on from the control room.

COMMISSIONER GILINSKY: That is a modification that will be made.

MR. PURPLE: It will be made during the first

fueling.

CHAIRMAN PALLADINO: I wanted the information because Commissioner Gilinsky's trip report implied that the operating point was very difficult to get at.

MR. PURPLE: That will have been removed by the end of the first refueling interval.

COMMISSIONER GILINSKY: I am pleased that this change has been agreed to. There is still one aspect of it that concerns me and that is the actuation of a system depends on some operator judgment on whether or not he is in a LOCA. It seems to me that in this case it really ought to be automatic. Automatic either in the sense that you simply turn it on when you get safety injection or automatic entirely which I think would be better or conceivably have the thing on all the time which would entirely eliminate it as a matter of concern.

If you leave it as a matter of judgment for the operator, you then leave yourself open to the possibility that you will not have recognized an event that requires this sort of action and when you turn it on, you can get yourself into trouble.

There are also aspects of the procedures that allow you to turn it off after you have turned it on given certain circumstances and I just don't think there ought to be any of this back and forth on this. It is a simple system. It is

turning on the lights.

MR. DENTON: We ended up giving them an option in Sequoyah and we discussed the same issue. The arguments are basically the same.

COMMISSIONER GILINSKY: That may well be the same thing we apply there. There are two possibilities at this point. We can either make it entirely automatic and I understood they were still going to reflect on that or make it procedurally automatic which I think it ought to be.

MR. DENTON: My understanding is at the moment it is procedurally automatic. They were defined very precisely and it will call for the operator to turn it on if they have a valid loss of coolant accident and that will be defined.

COMMISSIONER GILINSKY: Right. But there have been loss of coolant accidents that were not recognized. It seems to me that one simply wants to eliminate this as a possibility. We are not talking about anything that involves any other risk. It is not a complicated thing. It doesn't involve changing valve positions and causing all sort of other possible mistakes. It is just a simple thing. It is like turning on the lights.

COMMISSIONER AHEARNE: What is the argument, Harold? I seem to recall in the Sequoyah time there was some sense that this would be looked at further and maybe more thought

given to it.

MR. DENTON: Let me ask Roger to respond.

COMMISSIONER GILINSKY: Every now and then someone brings up the possibility that you don't want to wear these things out. You are talking about General Motors glow plugs which are turned on and can take an awful lot of turning on.

MR. MATTSON: There has been a demonstrated life through testing which is on the order of 150 to 200 hours. There are something like eight safety injections per year in PWR's in America. It wouldn't take too many years with too many hours per safety injection and you would have exceeded the demonstrated design life of the glow plug. That is one consideration.

Another consideration and one which has shaped our review of the on design basis features that we have been dealing with since Three Mile Island is the concept of treating things realistically and not requiring all of the safety grade gold-plated features that go with the design basis engineered safety features.

So we give utilities an opportunity to show us that they have the wherewithal, the training, the access, the ability, to turn equipment on manually with plenty of excess time to do it and we let them do it manually rather than automatically for that class of equipment beyond the design basis of which this is one component.

I understand the utility has agreed to put the manual in the control room. That is beyond what we would have required of the utility already. We would have allowed manual outside the control room using our reasonable test. Is there access? Are they able? Do they have the training?

To go further and make it automatic, we don't have a basis. That is, we can't say that it is safety grade and therefore under our regulations has to be automatic.

COMMISSIONER GILINSKY: I guess I am not putting it in terms of your requiring it, but I certainly think that it would be a good idea.

CHAIRMAN PALLADINO: I think it is something that ought to be studied before we jump to a conclusion because there appear to be compensating -- there are a balance of factors to be considered.

COMMISSIONER GILINSKY: As I understood it, Duke was going to take a look at that and I hope they will and let us know what they think.

CHAIRMAN PALLADINO: Can we go on?

COMMISSIONER AHEARNE: I have a question on hydrogen mitigation. It relates to a question that Commissioner Gilinsky had asked the other day. In what sense is this approval equivalent to this is now the final version for any igniter hyrdrogen mitigation system in any plant? Would the staff view this as equivalent to a generic approval

of this type system?

COMMISSIONER GILINSKY: I must say for myself, I would prefer to deal with this in the context of this licensing and it is satisfactory for that purpose. But given these other questions, I wouldn't like to give them a final sign-off.

MR. PURPLE: There are two questions I think I heard. One was whether or not this could be the final sign-off of a permanent hydrogen system for the McGuire 2 station.

COMMISSIONER AHEARNE: No.

CHAIRMAN PALLADINO: He didn't ask that.

MR. PURPLE: You didn't ask that. You asked whether it would be implied as a generic sign-off on a system applicable to any plant.

COMMISSIONER AHEARNE: Right.

MR. PURPLE: I am not aware that the staff has gone that far. The staff has gone in this SER far enough to believe that the system that is in place in McGuire 2, we could support for McGuire 2 as being the permanent system.

COMMISSIONER AHEARNE: Fine.

MR. PURPLE: I think Commissioner Gilinsky was addressing that aspect saying he is not sure that he would want to address that issue today even for McGuire 2. I think.

COMMISSIONER GILINSKY: Correct.

MR. PURPLE: There is a license condition now on

McGuire 2 that was issued with the low-power license that says by the first refueling interval, the licensee must demonstrate that he has a permanent system that is satisfies all requirements.

CHAIRMAN PALLADINO: Is this system not the same as Sequoyah and didn't we make that permanent?

MR. PURPLE: We reviewed in Sequoyah their system and you voted that, yes, that satisfied the license condition for a permanent system. We discussed a little bit earlier today that this system is basically the same although it uses a different type of igniter.

COMMISSIONER GILINSKY: It is now being brought into a state where it will be very close or maybe identical to what Sequoyah has.

MR. PURPLE: Yes.

MR. DENTON: We saw this is a final sign-off for units 1 and 2 of McGuire.

CHAIRMAN PALLADINO: Does unit 1 have the same?

MR. PURPLE: Yes. Unit 1 has the same as Unit 2.

CHAIRMAN PALLADINO: Do we have experience with that as a basis for saying that this is a solution for unit 2?

MR. DENTON: I don't know that we relied on experience. It was more in the calculational and experimental.

COMMISSIONER GILINSKY: Testing and calculations

really. I think we wanted more time to look into various aspects of things.

MR. PURPLE: But not a matter that unit 1 was run for a few months. The operation of unit 1, itself, as a reactor didn't further test their hydrogen mitigation system.

CHAIRMAN PALLADINO: What is it that you would propose?

COMMISSIONER GILINSKY: I would just like to deal with this in the context of this licensing. I am prepared to approve it on that basis.

CHAIRMAN PALLADINO: But what are we approving? We are approving it as to both units.

COMMISSIONER GILINSKY: Just let me put it this way. I am still concerned about this procedural aspect and possibly the making of it entirely automatic.

CHAIRMAN PALLADINO: I was just trying to understand what we would be approving.

COMMISSIONER GILINSKY: I don't want to let that go to the extent that we wouldn't hear about that again.

CHAIRMAN PALLADINO: So what are you saying? We approve this until such time as we get a report or an evaluation back. I am not quite sure what your condition is.

COMMISSIONER GILINSKY: I haven't formulated it in those terms. I simply came here prepared to deal with the full power license. I guess I would like to pursue this point.

MR. DENTON: I would propose that the action that you are taking today is an approval for McGuire 1 and 2. We would be happy to meet with the Commission again on a continuing issue and there may be another plant that we will have to address this issue on.

CHAIRMAN PALLADINO: I gather he had a question about McGuire 2. That is what I was trying to settle before we go on. If we approve McGuire 2, what will we have done about the hydrogen control situation? I would have assumed that we approved it.

COMMISSIONER GILINSKY: As a practical matter we have approved it until we do something different. But I do want the thing to come back because I am concerned about the way the procedures are set up now.

MR. DENTON: I think questions of automatic versus manual would apply to Cook and Sequoyah. So that issue might be taken up generically.

CHAIRMAN PALLADINO: I think that might be the better approach.

MR. MATTSON: You have a final rule-making on hydrogen control which includes hydrogen control for small containments which is wending its way to you very soon. It might be a place to take that up.

CHAIRMAN PALLADINO: That sounds good.

COMMISSIONER GILINSKY: The only problem here is

that a licensee is going to comply with this requirement and is not going to do things which may make it awkward for him to make it automatic in the sense of not involving operator action. But I would say that that ought to be presented as an acceptable alternative as a minimum.

COMMISSIONER AHEARNE: I don't think the staff would object if they had come in and said it was automatic.

CHAIRMAN PALLADINO: What?

COMMISSIONER AHEARNE: If a licensee were to propose an automatic system, would you object?

MR. MATTSON: No.

COMMISSIONER ASSELSTINE: Presumably as long as that also addressed the reliability issue.

CHAIRMAN PALLADINO: Yes. I would hesitate though doing it without some careful consideration of all of the factors involved.

COMMISSIONER GILINSKY: I think it may be simpler for the licensee. It may simplify a lot of things. It takes it out of procedures and so on.

CHAIRMAN PALLADINO: Are you ready to go on?

MR. PURPLE: Yes, sir.

(SLIDE.)

MR. PURPLE: The viewgraph that is up there now is the topic that you have addressed, I guess, on every full power authorization meeting since TMI and that has been

labelled independent verification. In the case of McGuire and Duke Power Company, the staff judged that because of their extensive nuclear design experience, construction, their demonstrated adequate performance in relation to other units that were already licensed, their construction record and so forth that additional extra measures similar to an independent design construction verification program were not needed for the McGuire station and were therefore not performed. The staff is able to be comfortable with that fact because of the items listed in the first bullet.

That is all I really meant to say on that. We had discussed this before, I think, in an earlier briefing where we talked about the whole ID/CVP program where we mentioned that McGuire was the one unit that didn't need this.

(SLIDE.)

MR. PURPLE: I would move on to emergency response facility. There is no major issue here. It is of interest that the licensee has decided relatively recently within the last six months to change his plans on where he would have his permanent emergency operating facility. He had earlier planned that it would be located very near the site in his training and technology center.

He has now decided to move that to Charlotte which is 15 miles from the plant and would be in complete compliance with the guidelines and criteria of the Commission with

respect to locating EOF's. They are in the process of making that move and they expect to be able to have a transition from their earlier interim EOF to that permanent facility sometime in the summer.

I know of no issue here either offsite or onsite or in their EOF's that is of any concern certainly not to the staff.

COMMISSIONER GILINSKY: This seems like a sensible thing to do. I gather though that they are interested in using that as a center for some of the other plants which are further away. That is something that we will have to think about.

(SLIDE.)

MR. PURPLE: The next viewgraph deals with one really not significant item on equipment qualification. There is a license condition in the license that I thought might be helpful to clarify in case the question were raised why is it there.

It says that McGuire 2 would meet the implementation schedule of 10 CFR 50.49(g). The obvious question would be well if he is meeting the regulation, why do you have to put it in as a license condition. It is to provide clarification. Section 50.49(g), the words of it, explicitly deal with operating reactors as opposed to an applicant for an OL. It is our best understanding and clear understanding that the

regulation was meant to imply that the March 1985 deadlines and so forth would certainly apply to a unit like McGuire now getting its license. But to remove any ambiguity, we thought it would be better to have it as a license condition and make it very clear that for McGuire 2, it will have to meet the implementation schedule of what is in 50.49(g) meaning the March of 1985 or some refueling intervals and I forget exactly how that is worded.

That is the only reason this is included.

COMMISSIONER GILINSKY: Can you give us a clear statement on where you stand in reviewing equipment qualification at McGuire?

MR. PURPLE: I could probably get a clearer one if I asked Vince Noonan to do that.

MR. NOONAN: On the McGuire unit 2, the review for equipment qualification, we probably have done the most rigid review of any applicant to date. We have had the benefit on this particular plant of the technical evaluation reports that were done by Franklin in addition to the staff efforts on this thing.

We have looked at all of the so-called requirements for McGuire unit 2 with regard to 10 CFR 50.49 and except for the qualified life and the replacement intervals, all of this has now been approved and is ready to go for this particular plant.

COMMISSIONER GILINSKY: I asked OPE to do a memo, have you seen that?

MR. NOONAN: Yes, sir.

COMMISSIONER GILINSKY: In fact, I want to thank you for doing that on very short notice. They pointed to a couple of areas where they thought the justifications seemed to be a little weak. One of them was thermocouples and the other was rote torque actuators. I wonder if you could say something on that.

MR. NOONAN: Yes, sir. On the thermocouples, that was addressed in supplement five to the McGuire SER. It was just not referenced in supplement seven. But the other systems that would refer to the thermocouples were addressed by the staff in supplement five.

COMMISSIONER AHEARNE: What other systems?

MR. NOONAN: I guess Dr. Mattson's people have looked at that in detail and have agreed there are other systems that would supplement the thermocouples.

COMMISSIONER GILINSKY: Can you say what they are?

MR. MATTSON: The level indicators.

MR. DENTON: Inadequate core cooling.

COMMISSIONER GILINSKY: What is the status of the thermocouples?

MR. NOONAN: They will be fully installed and operational at the first refueling outage.

COMMISSIONER GILINSKY: There aren't any thermocouples in now?

MR. NOONAN: They are in now but they are not powered.

CHAIRMAN PALLADINO: They are not what?

MR. NOONAN: They are not powered. There is no power to them.

COMMISSIONER GILINSKY: Can you just explain that situation? Why is that?

MR. NOONAN: Do you mean why they are not set up? I just think that this is part of the TMI review status and they were not required to be in there at this point in time.

COMMISSIONER AHEARNE: Roger, you said the level indicator.

MR. MATTSON: I misspoke. I have no idea what the backup is.

COMMISSIONER GILINSKY: Can we hear from somebody?

MR. NOONAN: Let me bring Bob LaGrange up here.

MR. LAGRANGE: My name is Bob LaGrange and I am with the equipment qualification branch. Supplement five of the McGuire SER, it talks about TMI, action item 2(f)(2) and it describes the other instrumentation that is available to detect inadequate core cooling besides these thermocouples.

I could read to you from it if you like. The existing instrumentation at McGuire for detection of inadequate core cooling consists of a subcooling monitor which has

temperature inputs from both core exit thermocouples and RTD's, one wide range RTD per loop and redundant coolant pressure sensors, one low range and one wide range.

These are the same instrumentation that the licensee has referenced in their response on equipment qualification relative to these thermocouples. They are referring to this other instrumentation that is qualified that will perform the functions of these thermocouples until they are qualified and operational at the first refueling outage.

COMMISSIONER GILINSKY: Do you have any comment on that, Jack?

MR. ZERBE: No. We just didn't have access to that information.

COMMISSIONER GILINSKY: All right. What about the other item, the rote torque actuators?

MR. LAGRANGE: The rote torque motor operators, that was really not a justification for interim operation. The information submitted by the licensee taken together with the result of the testing done to demonstrate an environmental qualification of this equipment demonstrates that this equipment is qualified for its applications in McGuire.

I have to emphasize the word application in McGuire becaused based on the results of that testing, it could very well be unqualified in other plants for other applications. However, for the McGuire applications, it is qualified.

COMMISSIONER GILINSKY: Thank you.

MR. PURPLE: If we can move off this topic, I would like to turn the microphone over to Dick Lewis from Region II to give you some views from experience.

MR. DENTON: Dick, before you begin I thought we had better come back to the thermocouples for just a moment because they are installed and they can be used. I thought the issue was just that they haven't been environmentally qualified yet and I wanted to clarify that. If that is not my understanding, maybe we ought to ask the licensee what he intends to do with them. I think it is just a question of they have not yet been environmentally qualified and he is in the audience and perhaps you would like to ask.

COMMISSIONER GILINSKY: Sure.

CHAIRMAN PALLADINO: Could you come up to the microphone, please?

MR. COPP: Skip Copp with Duke Power Company. That is correct. The thermocouples are installed now and the intention is to upgrade the qualification of those thermocouples by installing new ones in the containment. That will be done during the first refueling outage. At the same time the system outside the containment will be upgraded as a part of the control room design review process. That is what it integrates in with.

CHAIRMAN PALLADINO: Are these thermocouples in

there capable of being used?

MR. COPP: Yes, sir. They are capable of being used right now and they are wired up to the subcooling monitors. So they are, in fact, used at this point.

Another point that was brought up was the reactor vessel level system. On Unit 1, that system is installed. It has not been fully powered up and checked out yet. On Unit 2, it has not been installed but it will be installed by the first refueling.

CHAIRMAN PALLADINO: Thank you.

COMMISSIONER GILINSKY: I wonder if you have any further comment, Jack?

MR. ZERBE: No.

COMMISSIONER GILINSKY: Okay. Good.

CHAIRMAN PALLADINO: All right. Let's move on.

MR. LEWIS: My name is Dick Lewis. I am division director of reactor projects and resident programs, region II. Probably the best place to start on here is the last SALP that was presented of the Duke Power Company, specifically of McGuire and on unit 2, that SALP period ended May 30, 1982.

We do our SALP in region II where we look at the entire untility at one SALP evaluation which in this case would include the Ocone, the McGuire and the Catawba facilities, but they are evaluated as separate facilities.

Realize that McGuire unit 2 during this period

of time, they would have been in the late construction and the preoperational testing phase so it really did not impact or would not have evaluated their capability on unit 2 to operate.

We did find in preoperational testing that they were a category one level achiever which we consider or category one is evaluated to be a high achiever.

(SLIDE.)

MR. LEWIS: Probably the better indicator is to look at McGuire unit 1 which was an operating facility at that period of time. We found that in the areas of radiological controls, maintenance, surveillance, emergency preparedness, initial fuel loading and power ascension testing that they were a category one achiever. We found no areas at McGuire or Ocone where we considered them to be a category three or an area that requires increased Duke management attention or increased inspection effort on the part of NRC.

MR. PURPLE: Why don't you go on to the next slide.

(SLIDE.)

MR. LEWIS: We presently are in the process of completing the next SALP evaluation of Duke. Another area on Duke that we look at before we make a finding and recommend to NRR issuance of a license, we formally convene a panel in Region II of which I chair and consists of the other division directors, branch chiefs, section chiefs, resident

inspectors and so forth and before that panel is convened we send out a notice to every technical person in Region II asking them by memorandum requesting a response whether they have any concern or know of anyone who has a concern about issuance of a license to that facility.

In our query of the technical staff we received back no response from any member that indicated there was a concern for licensing of the McGuire facility. At that panel meeting we also take a look at the inspection program that has taken place at the McGuire facility, the outstanding items list, the letter of completion that came in from Duke Power Company to the NRC stating that the facility had been completed and for those items that had not been completed what remained to be completed.

We looked at the SALP evaluation, the enforcement history and any other outstanding items. We then make that formal presentation to O'Reilly. He, in turn, then writes a letter to NRR. In this case, we had no items that would impact on region II not making a recommendation for issuance of a license.

COMMISSIONER ROBERTS: Excuse me. Is that process unique to your region?

MR. LEWIS: I can't speak for the other regions but I believe it is unique.

COMMISSIONER ROBERTS: Thank you.

MR. DENTON: My experience is that it is more formal. The other regions do it similar but I don't believe they quite document it in the same manner.

MR. LEWIS: To address a little bit on the McGuire unit 2 operating history since receipt of a license on March 3, up to five percent power, the initial criticality was initially planned for April 22. In fact, it was achieved then on May 8, 1983.

The major contributors causing the delay was the resolution of the reactor trip breaker which resulted in about a ten-day delay. The other item was that Duke Power Company in their review determined that some of the containment by-pass leak surveillances required of containment penetrations and there were some 47 of these penetrations had not been soap-bubble tested.

They, in fact, had been leak rate tested, subjected to the structural integrity test and had undergone the integrated leak rate test successfully without any leakage being observed but as an additional check to check for a small crack in the weld, there was a requirement that they do a soap-bubble test of them during the integrated leak rate test.

This required that they go back in and repressurize the containment to half pressure and do the soap-bubble test of which they did. It caused a delay of about six days on initial criticality and the findings were that they found no

leakers on any of the welds that they checked.

Licensee Event Reports that have occurred since the issuance of an operating license, there have been nine. Four of them were attributed to personnel error. Four of them to equipment problems and one to a procedural inadequacy. None of the events resulted in any equipment damage or placed a transient on the plant and the LER's themselves do not represent to us a trend of any kind of programmatic deficiency.

Enforcement actions since issuance of an operating license, there have been two. One violation concerned maintenance documents not being properly controlled. In fact, the worker was using the proper document. The document control room had an outdated document or it was misfiled and there was an inadequate surveillance procedure for reenergizing the solid state system which resulted in a safety injection.

There are no escalated enforcement actions pending at the McGuire facility by NRC. A quick briefing on INPO inspection, there was an INPO inspection conducted of the McGuire facility in 1982 and in the INPO report they noted that plant personnel exhibit a superior morale and positive attitude towards their work.

The specific recommendations of INPO was that they increase management emphasis on procedural adherance, that there is a backlog of preventive maintenance items that

do not assure the highest plant reliability or optimum equipment performance that needs to be looked at and Duke Power Company make better use of industry operating experience that is available to them.

There has been a second INPO inspection of McGuire that was conducted earlier this year. The report has not been issued. Our senior resident inspector did attend that exit interview when INPO made the findings formally to Duke and it is my understanding that there are no significant items pending as a result of that INPO inspection.

The last known allegation that Region II has received from any one concerning the McGuire facility was in 1978 and we have not had any since then.

COMMISSIONER ROBERTS: That's incredible.

MR. LEWIS: I would like to conclude by stating that region II recommends that the facility be permitted to undertake power ascension testing. They have successfully completed the initial criticality and the zero power testing and we believe that they are ready to proceed go full power testing.

That concludes my presentation.

CHAIRMAN PALLADINO: Thank you, Dick. Are there any questions?

COMMISSIONER GILINSKY: I think that is a very good report. I would also like to commend Region II for having a

more formal process of this sort, for their review of plants that are approaching commercial operation.

MR. LEWIS: Thank you, sir.

CHAIRMAN PALLADINO: Anything more?

MR. PURPLE: I think we are through, too, other than the very similar conclusionary statement that Dick just gave which would be the very last viewgraph, please.

(SLIDE.)

MR. PURPLE: The staff concludes that the licensee has satisfied all outstanding issues and the license conditions that otherwise restrict the operation of McGuire 2 to five percent of full power.

CHAIRMAN PALLADINO: Does that conclude the staff's presentation?

MR. DENTON: Yes, it does.

CHAIRMAN PALLADINO: Are there any other questions the Commissioners would like to raise?

COMMISSIONER AHEARNE: Just a couple. With respect to operators, I noticed that Jim Joosten sent through a trip report and he mentioned that McGuire has recently gone to 12 hour shifts. Is there any implication there that by going to the 12 hour shifts that is because they were having difficulty getting enough operators to man both units 1 and 2?

COMMISSIONER GILINSKY: I think the operators prefer it that way.

COMMISSIONER AHEARNE: What is the status of the pool of operators?

MR. DENTON: They have five shifts of operators and they work 12-hour shifts. Apparently they have done this at Ocone and they fully comply with all of the Commission regulations with regard to overtime and number of people, number of licensed operators. They have picked this as the most desirable operating scheme for themselves. They have a shift always in training and otherwise meet NRC requirements.

MR. PURPLE: They were not forced into it by a shortage of operators.

COMMISSIONER AHEARNE: Fine.

The second question, McGuire, I thought the spent fuel pool of McGuire 2 had been used at one time to take some transshipment of fuel or maybe it was Ocone's, is that correct?

MS. ADENSAM: No, Mr. Commissioner. The McGuire unit 1 spent fuel pool has been used for storage of Ocone elements.

COMMISSIONER AHEARNE: Not unit 2?

MS. ADENSAM: Not unit 2.

MR. EISENHUT: Let me make sure I clarify that. It is a common pool at McGuire 1 and 2. The shipment at the time was an Ocone-McGuire transfer. The fuel is in the McGuire fuel pool.

COMMISSIONER AHEARNE: My question is in the licensing of this particular plant, is there anything unique that has to be done because of the mixture of various fuels?

MR. EISENHUT: No. There wasn't anything done. We didn't think anything was necessary.

COMMISSIONER AHEARNE: All right. My last question wasI don't think we ever did an immediate effectiveness on unit 2. Does that cause us any problem in this proceeding?.

MR. TRUBATCH: I am sorry. I didn't catch that.

COMMISSIONER AHEARNE: My question was as I recall we never did an immediate effectiveness on unit 2. We did an immediate effectiveness on unit 1.

MR. TRUBATCH: That is correct.

COMMISSIONER AHEARNE: I didn't know whether that causes us any procedural difficulty?

MR. TRUBATCH: I don't believe so, no.

COMMISSIONER AHEARNE: So we don't need to do a separate order.

MR. TRUBATCH: No.

MR. CHRISTENBURY: Commissioner, I would point out that the Appeal Board's decision which agreed with the Licensing Board's conclusion was before the Commission for a period of time and the Commission determined that it would not review that decision and that has become final agency action.

COMMISSIONER AHEARNE: As I recall, our decision

though was focussed on unit 1.

MR. CHRISTENBURY: The immediate effectiveness review that the Commission did was only for unit 1. That is correct. The point I was making was that the decision has now become final agency action. I would agree with the General Counsel that nothing further is required.

CHAIRMAN PALLADINO: Any other questions?

(No response.)

CHAIRMAN PALLADINO: Before I call for a vote, I was wondering whether a representative from McGuire or from Duke Power wished to make any statement?

MR. TUCKER: Yes, sir. I am H. B. Tucker, vice-president of nuclear production with Duke. We came to offer any assurance the Commission may need that we feel that the plant is fully qualified to operate from a technical standpoint and has been adequately reviewed by the staff and is competently staffed.

The station is fully staffed. All the license operators associated with this unit have been at McGuire since the original issue of license on number 1 and have experience on that unit and there is interchangeability of operators so we feel that they are fully qualified and we are ready to operate the plant.

The question arose originally about our status. At 12:00 o'clock today, we would be at five percent power waiting

for you to give your permission and we will go!

(Laughter.)

CHAIRMAN PALLADINO: All right. Thank you. At this time then let me ask the Commission to vote on the question whether or not to allow the staff to issue full power authorization. Aye would mean that we would authorize or allow the staff to issue a full power authorization.

All those in favor, indicate by saying aye.

(Chorus of unanimous ayes.)

CHAIRMAN PALLADINO: Opposed?

(No response.)

CHAIRMAN PALLADINO: I think we have gotten the answer that you were looking for.

COMMISSIONER AHEARNE: With six minutes to spare.

CHAIRMAN PALLADINO: That's right. If there is nothing further to come before us, the meeting is adjourned.

(Whereupon, the meeting was adjourned at 11:54 o'clock p.m., to reconvene at the Call of the Chair.)

- - -

NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before the

NUCLEAR REGULATORY COMMISSION

in the matter of: Discussion/Possible Vote on Full Power Operating License for McGuire 2

Date of Proceeding: Friday, May 27, 1983

Docket Number:

Place of Proceeding: Rm. 1130, 1717 "H" St., N.W.
Washington, D. C.

were held as herein appears, and that this is the original transcript thereof for the files of the Commission.

Marilynn M. Nations
Official Reporter (Typed)

Marilynn M. Nations
Official Reporter (Signature)

COMMISSION BRIEFING

WILLIAM B. MCGUIRE NUCLEAR STATION, UNIT 2

FULL POWER AMENDMENT

MAY 27, 1983

BRIEFING OUTLINE

- o LICENSEE - PLANT BACKGROUND
- o STATUS AND SCHEDULE
- o SELECTED REVIEW ITEMS
  - STANDBY SHUTDOWN SYSTEM (FIRE PROTECTION)
  - REACTOR TRIP BREAKER ISSUE
  - STEAM GENERATORS
  - HYDROGEN MITIGATION SYSTEM
  - INDEPENDENT VERIFICATION EFFORTS
  - EMERGENCY RESPONSE FACILITIES
- o EXPERIENCE REPORT
  - ASSESSMENT OF LICENSEE PERFORMANCE
  - UNIT 1 EXPERIENCE
- o CONCLUSIONS

LICENSEE PLANT BACKGROUND

- DUKE POWER COMPANY
- A/E AND CONSTRUCTOR FOR OCONEE, MCGUIRE AND CATAWBA
- MCGUIRE 2 PLANT:
  - IDENTICAL TO MCGUIRE 1 (OL ISSUED 1981)
  - WESTINGHOUSE 4 LOOP 1180 MW_E PLANT
  - ICE CONDENSER, FREE STANDING STEEL CONTAINMENT
  - LOCATED IN MECKLENBERG, NORTH CAROLINA
  - HEARING COMPLETED WITH UNIT 1

STATUS AND SCHEDULE

o OPERATING LICENSE (5%) ISSUED	3/3/83
o FUEL LOADING	3/4-8/83
o INITIAL CRITICALITY	5/8/83
o COMPLETE 5% TESTING	5/20/83
o TESTING TO 50%	6/18/83 (E)
o STEAM GENERATOR MODIFICATIONS	6/18/83-8/1/83 (E)
o PROCEED ABOVE 50%	8/1/83 (E)

SELECTED REVIEW ITEMS

STANDBY SHUTDOWN SYSTEM (SSS)

(FIRE PROTECTION)

- DESIGNED TO PROVIDE MCGUIRE UNITS 1 & 2 AN ALTERNATE AND INDEPENDENT MEANS TO ACHIEVE HOT STANDBY CONDITION.
- POWER SYSTEM DESIGNED TO PROVIDE INDEPENDENT AC AND DC POWER REQUIRED TO ACHIEVE HOT STANDBY.
- THE STANDBY SHUTDOWN FACILITY SUPPORT SYSTEM IS SELF CONTAINED.
- STAFF HAS REVIEWED THE MCGUIRE UNITS 1 & 2 SSS AND FOUND IT ACCEPTABLE WITH THE FIRE PROTECTION AND INSTRUMENTATION LICENSE CONDITIONS [2.C.(7)(a) & (c)].
  - LICENSEE APPEAL LETTER 3/31/83

REACTOR TRIP BREAKER ISSUE

- EXPERIENCE WITH DS 416 UVTA
- CAUSE OF FAILURES
- CORRECTIVE MODIFICATIONS
- MODIFICATIONS TO PROCEDURES
  - SURVEILLANCE
  - PREVENTIVE MAINTENANCE
  - TEST PROGRAM

REACTOR TRIP BREAKER

CAUSE OF FAILURES

- o DESIGN
  - MISSING RETAINING RING (KEEPER) ALLOWED SHAFT TO DISLODGE FROM END SUPPORT
- o QUALITY CONTROL/QUALITY ASSURANCE
  - UVTA INTRA-CLEARANCES NOT MET
    - A. ROLLER BRACKET SIDE TO SIDE
    - B. ROLLER BRACKET TO MOVING CORE
  - UVTA-RTB INTER-CLEARANCES NOT MET
    - A. NO GAP
    - B. RESET OVER-TRAVEL

REACTOR TRIP BREAKERS

CORRECTIVE MODIFICATIONS

- DESIGN
  - REDESIGN OF GROOVE AND RETAINING RING
- QUALITY CONTROL/QUALITY ASSURANCE
  - 100% INSPECTION OF UVTA
  - INSTALLATION CLEARANCE CRITERIA FOR PROPER ALIGNMENT AND INTERFACE OF UVTA WITH RTB

REACTOR TRIP BREAKER
MODIFICATIONS TO PROCEDURES

- SURVEILLANCE
  - ENHANCED
    - A. FREQUENCY
    - B. UVTA AND SHUNT INDEPENDENTLY
    - C. RESPONSE TIME
- PREVENTIVE MAINTENANCE
  - FORCE TEST
    - A. TRIP SHAFT REQUIRED
    - B. UVTA OUTPUT
  - DIMENSIONAL CHECKS
- TEST PROGRAM
  - LIFE/RELIABILITY TESTS OF UVTA
    - A. STATISTICALLY SIGNIFICANT
    - B. USEFUL LIFE IN CYCLES
  - MODIFICATIONS TO SURVEILLANCE/MAINTENANCE
- POST-TRIP PROCEDURES
  - UPGRADE REQUIRED
  - LICENSEE ACTIONS

MCGUIRE UNIT 2

PERIODIC SURVEILLANCE/MAINTENANCE OF REACTOR TRIP & BYPASS BREAKERS *

PRE-STARTUP (<7 DAYS)

(REACTOR TRIP BREAKERS)

. FUNCTIONAL TEST OF UV TRIP DEVICE
. FUNCTIONAL TEST OF SHUNT TRIP DEVICE
. FUNCTIONAL TEST OF MANUAL TRIP FROM CONTROL ROOM

MONTHLY (EVERY 31 DAYS) SURVEILLANCE

(REACTOR TRIP BREAKERS)

1. A. FUNCTIONAL TEST OF UV TRIP DEVICE
   B. RESPONSE TIME TESTING OF UV/BREAKER ON UV SIGNAL FROM RPS
2. FUNCTIONAL TEST OF SHUNT TRIP DEVICE

EVERY 6-MONTH SURVEILLANCE/MAINTENANCE

(REACTOR TRIP & BYPASS BREA

1.** TEST OF UV/BREAKER RESPONSE TIME ON UV SIGNAL FROM RPS
2.** FORCE TEST ON TRIP SHAF
3.** FORCE TEST ON UV DEVICE OUTPUT
4. FUNCTIONAL TEST OF SHUN TRIP
5. SERVICING/LUBRICATION ADJUSTMENTS
6.** CHECK TOLERANCES OF TRI TAB
7.** INSPECT LUBRICANT AND CLEANLINESS O ROLLER BEARING

PRESERVE EVIDENCE OF & PROMPTLY (24 HRS) REPORT ANY FAILURE OF RTB OR BYPASS BREAKERS, EITHER IN SERVICE OR DURING TESTING.

*TO BE PERFORMED BEFORE & AFTER PREVENTIVE MAINTENANCE

STEAM GENERATORS

- SAME AS MCGUIRE 1, SUMMER.

- MCGUIRE 2 POWER OPERATION IS RESTRICTED TO 50% PENDING STEAM GENERATOR MODIFICATION PLANNED FOR JUNE OF 1983.

- MODIFICATIONS IDENTICAL TO THOSE COMPLETED FOR UNIT 1 IN MAY, 1983.

HYDROGEN MITIGATION SYSTEM

- MCGUIRE UNIT 2 HAS A DISTRIBUTED HYDROGEN IGNITION SYSTEM SIMILAR TO MCGUIRE 1.
- STAFF CONCLUDES THAT THE MCGUIRE HYDROGEN MITIGATION SYSTEMS PROVIDE ADEQUATE SAFETY MARGINS WITH THE FOLLOWING LICENSE CONDITIONS:
  - INSTALLATION OF SYSTEM STATUS INDICATION IN THE CONTROL ROOM
  - INSTALLATION OF ADDITIONAL IGNITERS
  - INSTALLATION OF SYSTEM ACTUATION IN THE CONTROL ROOM

EMERGENCY RESPONSE FACILITIES

- o INTERIM EMERGENCY OPERATIONS FACILITIES
  - EMERGENCY OFFSITE FACILITY LOCATED IN CORPORATE HEADQUARTERS IN CHARLOTTE, NORTH CAROLINA 15 MILES FROM PLANT.
  - A NEARSITE FACILITY LOCATED IN TRAINING AND TECHNOLOGY CENTER.
  - A TECHNICAL SUPPORT CENTER LOCATED NEAR THE CONTROL ROOM.
  - AN OPERATIONS SUPPORT CENTER LOCATED IN THE SERVICE BUILDING.
- o LICENSE CONDITION REQUIRES MAINTENANCE OF THE ABOVE INTERIM EMERGENCY SUPPORT FACILITIES UNTIL THE OPGRADED FACILITIES ARE COMPLETED.
- o PERMANENT FACILITIES PROJECTED TO BE OPERATIONAL IN JULY 1983.

INDEPENDENT VERIFICATION EFFORTS

- THE DUKE POWER COMPANY WAS JUDGED BY THE STAFF TO HAVE EXTENSIVE NUCLEAR DESIGN EXPERIENCE, CONSTRUCTION EXPERIENCE, AND HAS DEMONSTRATED ADEQUATE PERFORMANCE RELATED TO OCONEE AND MCGUIRE.

- BASED ON THE ABOVE CONSIDERATIONS THE STAFF CONCLUDED THAT ADDITIONAL ID/CVP WERE NOT NEEDED FOR THE MCGUIRE STATION.

EQUIPMENT QUALIFICATION

- LICENSE CONDITION TO REQUIRE McGUIRE UNIT 2 TO MEET THE IMPLEMENTATION SCHEDULE OF 10 CFR 50.49(g).

EXPERIENCE REPORT

ASSESSMENT OF LICENSEE PERFORMANCE

- o SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE
- o REGION II REVIEW PANEL
- o OPERATING HISTORY SINCE LICENSING
  - DELAYS AND CAUSES
    REACTOR TRIP BREAKERS
    SURVEILLANCE
  - LICENSEE EVENT REPORTS
  - ENFORCEMENT ACTIONS
- o READINESS FOR FULL POWER OPERATION

CONCLUSIONS

- THE STAFF CONCLUDES THAT THE LICENSEE HAS SATISFIED ALL OUTSTANDING ISSUES AND THE LICENSE CONDITIONS RESTRICTING THE OPERATION OF MCGUIRE UNIT 2 TO 5% OF FULL POWER.

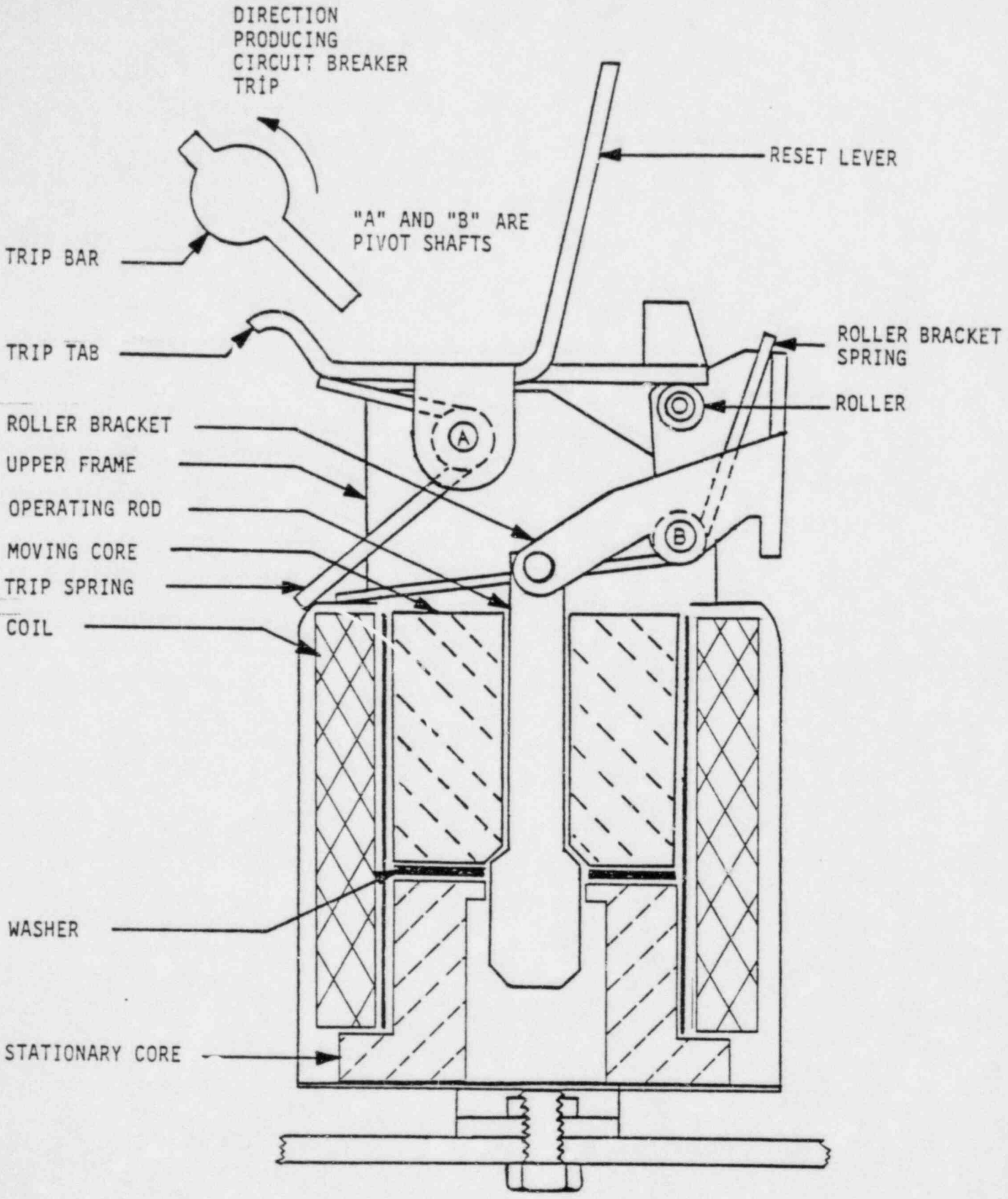
INTRODUCTION BY Z. ZUDANS

Scope of FRC Effort

- Evaluate the reported failures.
- Determine if other failure modes exist.
- Evaluate modifications made to device and new acceptance criteria.
- Evaluate baseline tests performed on McGuire UVTAs and reactor trip circuit breakers.

Key Conclusions

1. The corrective action for failures recognized by the Licensee and manufacturer is adequate.
2. FRC found the cleanliness of the roller bearing outer surface to be critical to correct action of the UVTA. Debris must not be allowed to remain on the bearing surface during operation.



DS-416 Undervoltage Attachment

FAILURES AND CORRECTIVE ACTION

1. Inadequate UVTA Internal Clearances

   a. Roller bracket to moving core
   b. Roller bracket to spacer bushing

   Corrective Action: Established minimum clearances.

2. UVTA Trip Tab to Circuit Breaker Trip Pin

   a. Gap too small
   b. Gap too large

   Corrective Action: Established test methodology and acceptance criteria.

3. Pivot Shaft Spring Clip Failure

   Corrective Action: Widened clip groove on shaft to assure proper seating of clip.

POTENTIAL FAILURE MECHANISMS AND PREVENTIVE ACTIONS

1. Debris on roller bearing outer surface

   Preventive Action: Check for cleanliness following testing and maintenance.

2. Increased roller friction in roller bearing

   Long Term Action: Evaluate potential for changes in frictional forces of bearing (such as change in consistency of grease with age). Take corrective action as indicated by evaluation.

CONCLUSIONS

1. FRC evaluation indicated that the failure modes recognized by Duke and Westinghouse (i.e., clearance problems within the UVTA, clearance problems between the UVTA and the CB, and pivot shaft retainer clip failures) have been corrected.

2. Acceptance criteria for minimum UVTA output and maximum circuit breaker input trip forces have been set by Westinghouse.

3. Acceptance criteria for clearances both internal and external to the UVTA have been set.

4. Baseline test results show that the McGuire RTCBs and associated UVTAs meet the acceptance criteria.

5. Short-term operation is acceptable based on the results of previous proof of design tests, evaluation of the modifications, and verification of critical dimensions following manufacture.

6. The FRC evaluation concluded that the forces associated with the roller bearing are extremely important for correct operation of the UVTA. A small piece of debris on the surface of the roller bearing can act as a chock and prevent unlatching. Increased rolling friction could rapidly reduce operating margins. No such failures have occurred to date.

RECOMMENDATIONS

1. Following maintenance, the outer surface of the roller bearing and the mating surface of the reset lever should be inspected for cleanliness. No debris of any kind should be on these surfaces. The roller bearing should be checked for free rotation.

2. The baseline tests of the UVTA and circuit breaker should be performed periodically, and the resulting data should be compared to the original baseline data and trended to determine if degradation is occurring.

3. Life testing of the UVTA should be performed to show that the device can successfully operate for the intended lifetime.

4. Criteria for a replacement interval should be developed for the UVTA so that the replacement occurs significantly before the expected end of life.

5. The roller bracket to roller bearing frictional forces should be evaluated to determine if probability of failure to operate increases with age of the bearing and grease. (This is not a short-term concern.)

12/82

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Meeting Title: Discussion/Possible Vote on Full Power Operating License for McGuire-2

Meeting Date: 5/27/83 Open ✓ Closed ____

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