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NUCLEAR REGULATORY COMMISSION

In the matter of:

COMMISSION MEETING

Continuation of 7/24
Briefing on Davis-Besse

(Public Meeting)

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D I S C L A I M E R

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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CONTINUATION OF 7/24 BRIEFING ON DAVIS-BESSE

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PUBLIC MEETING

Room 1130

1717 H Street, N.W.

Washington, D.C.

Tuesday, September 17, 1985

The Commission met, pursuant to notice, 10:40 a.m.

COMMISSIONERS PRESENT:

NUNZIO J. PALLADINO, Chairman of the Commission

JAMES K. ASSELSTINE, Commissioner

THOMAS M. ROBERTS, Commissioner

THOMAS M. ROBERTS, Commissioner

LANDO W. ZECH, Jr., Commissioner

STAFF AND PRESENTERS SEATED AT COMMISSION TABLE:

S. CHILK

H. PLAINE

J. WILLIAMSON

J. WILLIAMS, JR.

J. WOOD

STAFF AND PRESENTERS (Continued)

J. LINGENFELTER

S. SMITH

T. MYERS

S. JAIN

AUDIENCE SPEAKERS:

H. DENTON

PROCEEDINGS

CHAIRMAN PALLADINO: Good morning, ladies and gentlemen. Commissioner Bernthal has been detained but he will be joining us shortly.

The purpose of today's meeting is for the Commission to receive briefings by the Toledo Edison Company and the NRC Staff on the status of the Davis Besse Nuclear Power Plant.

On June 9, 1985, the Davis Besse plant experienced a complete loss of feedwater which led to a turbine and reactor trip. Although there were other malfunctions and human errors, plant operators were successful in bringing the plant to stable shutdown and in preventing any abnormal releases of radioactivity or any apparent major damage to the plant.

The NRC Incident Response Team evaluated the Davis Besse event, and the team briefed the Commission on July 24, 1985. Since then, the Staff has established Licensee requirements, and by letter dated August 14, 1985, requested information from Toledo Edison. The Licensee's response was received by letter dated September 12, 1985.

The purpose of today's meeting is to obtain information related to the decision to allow the restart of the Davis Besse plant. We will hear from the Licensee and from the Staff. I understand that Toledo Edison will speak first and that the Licensee had hoped that an hour would be allowed for his presentation. If possible, I request the

Licensee to try to limit his time to 45 minutes. For our part, I request that we limit our questions to those only directly related to Davis Besse.

With respect to the Staff presentation it is worth noting that the EDO must leave by noon in order to make an airplane, so if we have any questions for the EDO we should try to ask them before that time. However, I should point out that Mr. Denton and other members of the Staff will remain.

Do any of my fellow Commissioners have any additional opening remarks?

COMMISSIONER ASSELSTINE: The only question I would raise, Joe, is since we do have a fairly lengthy presentation from the utility, rather than try and rush through both, is it possible maybe to concentrate on the utility's presentation this morning, particularly since Bill has to leave about noon, and schedule a follow-up meeting with the Staff shortly after you and Fred return to the country?

CHAIRMAN PALLADINO: Well, I took a quick look at the schedule after Fred and I return, and there doesn't seem to be any opportunity for another meeting before the hearing before Mr. Markey. However, that shouldn't stop us from having follow-up meetings, except it would be difficult to have it before the Markey hearing.

Well, let's try to see that the Licensee gets enough time and at least try to get a half hour with the Staff.

COMMISSIONER ASSELSTINE: Good. I would just like to do justice to both presentations because it looks like a fair amount of work has gone into both of them.

CHAIRMAN PALLADINO: Well, I understand it took seven hours to discuss this matter with the Staff, on the part of Toledo Edison.

Okay, any other comments?

[No response.]

All right, then let me turn the meeting over to Mr. John Williamson, the CEO.

MR. WILLIAMSON: Chairman Palladino, Commissioner Asselstine, Commissioner Roberts, Commissioner Zech, I am John P. Williamson, Chairman and Chief Executive Officer of the Toledo Edison Company. We do appreciate this opportunity to make our presentation here today on the June 9th event on our findings from that event, and on our startup program overall.

May I begin by saying very simply that Davis Besse is our plant, it is our responsibility; we accept that responsibility. Safety has been, is and will continue to be our number one priority at that plant. Those are our people out there. I am responsible for their lives, and we are going to operate safely or we aren't going to operate at all.

Having said that, let me say that in our opinion, Davis Besse is not the best plant in the country at this time; neither is it the worst. It has been excellent in some

regards, needs a quantum improvement in other regards. Certainly, in the area of the lowness of radiation exposure per worker we are among the best if not the best plant in the country. Certainly, we have outstanding operators running the plant on a day-to-day basis.

But as certainly as those things, we also feel that we need to improve our maintenance, our training and our management of those programs overall.

Last year, we sensed the need for improvement in the plant, particularly with the impetus given us by the Region III people. We started a performance enhancement program. We thought we were on our way. I was very shocked by the SALP report last fall. The ratings in that report were truly shocking to me. As I reviewed the report, however, I felt it was a fair and balanced report, and we tried to speed up our program.

In January, when my president and chief operating officer succumbed to a heart problem, I picked up the responsibility directly for the operating part of our company including the nuclear mission. As I reviewed the nuclear mission, I determined that we needed to move our program faster than it was moving, and it was my conclusion that I needed to go outside the company, seek out a knowledgeable, aggressive, "doer" type of person to head that program.

I sought out Admiral Joe Williams, convinced him to

come in and pick up our program. We did not anticipate that the plant would go offline on June 9th. It did. That offered a new challenge to us, really a new opportunity to step back and take a very hard look at our whole program.

As a result of Admiral Williams coming onboard we have brought in several new excellent management people from the plant manager on down in the program. We have taken the outstanding people that we had, we have better assigned them to more fully utilize their knowledge and their capabilities in our program.

What you will be hearing from us today is a presentation by this new management team. I am very proud of them. They have come together very fast. They are experienced, they are doing a good job, they have learned to work as a team very fast, amazingly fast.

And I think with that by way of background again, leave me say that safety is and will continue to be our number one concern. We are concerned about people not only at the plant but in the area. My compact with Admiral Williams is that when he feels a plant is ready to start and you people feel it is ready to start, then Admiral Williams will have to convince me it is ready to start. And then we will go from there.

And with that, may I call on Admiral Joe Williams who is our Senior Vice President, Nuclear, to being our

presentation.

MR. WILLIAMS: Thank you.

CHAIRMAN PALLADINO: Joe, would you also introduce your other colleagues?

MR. WILLIAMS: Yes, sir, Mr. Chairman. On my left is Mr. John Wood who is the Manager of Structural and Mechanical Engineering Division of the Engineering Directorate; on my right, Mr. Lingenfelter who has the Technical Engineering Group and is responsible for the program of reviewing the other quality systems, and he will get into that; and Mr. Steve Smith who is the new Assistant Plant Manager for Maintenance.

As one of these gentlemen presents, Mr. Chairman, I intend for him to fire fallback and there will be somebody else come up and I'll introduce him at that time, if that's all right with you.

As Mr. Williamson said, we're delighted to be here to present the course of action in response to the 14 August letter that was signed by Mr. Denton, I think you called a 50-45. It's the roadmap by which we intend to get well.

I was particularly pleased that the letter addressed all of the issues surrounding Davis Besse and not just the specific ones on the 26th, because I think those lend themselves to engineering resolutions and you can go fix those. The other things are the programmatic issues that in

the long term will serve to really establish Davis Besse at the level of excellency that Mr. Williamson has said he desires.

I went out first and talked to Mr. Williamson first in April. I went out in May and talked to quite a few people, read a lot of documents, read the SALP report, their performance enhancement program, the details of that, came to some conclusions about what needed to be done, what needed to be changed programmatically, what needed to be changed about the resource application, talked to Mr. Williamson about them, and in general, we were in agreement on everything. And those issues that we addressed then are reflected in the course of action document in a more mature fashion.

There's nothing really remarkable about what we've done in management. In any organization like this or any operation like this you need a functional organization which provides the right lines of communications, the right lines of authority for the people; you need to make sure that the people understand what it is that you wish them to do, provide the quantity of people that's required to do the job, to get the requisite talen in there and to do that you have to provide adequate compensation to meet the demands of the marketplace.

[Slide.]

Briefly I will run through the organization that

exists now, and I won't dwell on what existed when I got there, but I don't think it's germane any longer.

I am the Senior Vice President at the top of the chart. Assistant Vice President -- by the way, the ones that are in the dashed lines are new positions that we have established. The ones with the yellow corners are positions that existed but I moved them in the organization, usually changing their reporting and, in some instances, their responsibilities.

The Assistant Vice President is now responsible for the administration, personnel and security. That's because those three functions are furnished to us by outside support, and they need concentrated attention of a competent person to make certain that the mission is getting that. I don't have that control -- not that I don't have a good response from them, but it's just a good managerial move to concentrate on those things. He also has the Nuclear Service Director.

In the nuclear engineering -- and I will talk more about that on the next slide, but we are completely revamping the engineering group to bring all of the engineering inhouse. When I got there I was fortunate to find a talented young man, Mr. Quennoz, who is the inplant manager, but he has the credentials to be one of the finest engineering heads in the country. So I established the position of Nuclear Engineering Group Director and placed all of engineering under

him. He brings to the engineering group an operational flavor that you just don't see anyplace else; you see it very few places. He is a qualified SRO, he has been a plant manager, he knows what kind of support is needed down there.

Nuclear Training Director, the third one from the left there, was reporting to a lower level. I booted him up and he is reporting directly to me. And that's because of the increased emphasis on the Training Department.

There was no Material Manager; that function is at the lower left. That function is provided by Corporate. I brought in a very experienced materials manager. I am going to leave the function with Mr. Williamson. I've decided for now we will leave it with the Corporate rather than bringing it under the Nuclear mission, but we are moving the entire operation out to the site so that it is right next to the customer. And this gentleman is interacting with them in a manner that will bring that into good shape.

COMMISSIONER ASSELSTINE: Joe, is that procurement -- spare parts and those kinds of things?

MR. WILLIAMS: Yes, sir, and I'll speak more about the spare parts issue because that comes into the configuration management program that we have set up, and there's an interim one that we'll address there. But I'm really satisfied with the way that particular piece of the action is coming together, both for the interim and then for

the long term.

[Slide.]

The Plant Manager -- I brought in a new plant manager to replace Mr. Quennoz when I moved him over to Engineering. He was a Navy Nuc enlisted man, and got out of Purdue, got his degree in mechanical engineering, moved up to Point Beach and cut his teeth on the civilian nuclear industry at Point Beach under Glenn, moved on down to the Summer Station where he was an operations manager there, and then down to Waterford 3 as the Assistant Plant Manager. And I brought him in as the Assistant Plant Manager.

Under him, we have elevated on the left with the yellow hatch, the Assistant Plant Manager for Operations, which really had a lower level and was a little over-burdened, and he was essentially the operations superintendent at the time. We established the position of Assistant Plant Manager and elevated that job both in terms of responsibility and also in terms of compensation.

The manager for maintenance at that time was a superintendent. We established the Assistant Plant Manager for Maintenance, and under him have really beefed up the maintenance organization to provide quality of maintenance in the amount that the workload demands. And I will have Mr. Steve Smith speak to that in detail.

Now the Technical Support Manager is a small

engineering group that I left down under the plat when I reorganized Engineering. We left him about 12 engineers down there for direct interaction. But really, their technical "daddy" is the Group Director for Engineering.

Also under the Plant Manager we've established a new position --

[Slide.]

-- of Planning Superintendent. That's people by Mr. -- I mean, I brought in Mr. Mike Shefers who was in the planning and scheduling business at General Dynamics, with me later at Zimmer. When Zimmer and I parted ways, he went to American Electric Power Company twin nuclear plants in Michigan where he was the scheduling manager. And so we have a large organization there to do the very important job of scheduling all of the work, including the unplanned outage work, and it's the key really to getting things done.

I want to go back to the Assistant Plant Manager for Maintenance. I brought in Mr. Steve Smith who was Navy Nuc and left and joined the civilian nuclear industry, and was Assistant Plant Manager for Maintenance at the Summer Station, left them and went into the consulting business helping plants around the nation establish good maintenance programs. And I just forgot to tell you about him.

[Slide.]

Engineering. I set up four divisions. The top one

is a new position, the Nuclear Engineering Group Director, Mr. Quennoz, who was the Plant Manager, has his Master's degree in nuclear engineering; a very well qualified, ex-Navy Nuc. Under him just for the interim, I've brought in Mr. O.J. Mavro from Stone & Webster who has been with me many, many places. Nuclear Engineering General Manager who is very good in the test area in particular and good at organizing engineers. And then during this transition period from a relatively small organization to a large organization I thought he'd be a great asset to Mr. Quennoz as they get their feet on the ground.

The Nuclear Facility Engineering Director heads up our design section in advance planning. He has a nuclear engineering manager under him, the mechanical and structural engineering manager and the electrical controls and engineering manager. And they were there but they were doing all of the engineering work that they could do, but primarily relying on Bechtel and B&W. And that operation was based in Gaithersburg, and that's where our drawings were and it was just a remote thing.

I'm going to bring all of that inhouse that I can, rely on Bechtel and B&W and others for just those types of things that I don't want to do because you can't hold those people accountable in the same sense as you can somebody that works for you. So we're beefing up the entire engineering,

we'll end up with about 220 in the engineering group.

The new one down there, the dashed one, is the Nuclear Plant Systems Manager. I think that in these plants you ought to have cognizant engineers that are responsible from cradle to grave for these systems and components, and that's what we're setting up in that organization.

Now of course, the chair at least wasn't there when they designed the plant, but they're responsible for the design, for any changes to it. Those people are responsible for the love and care and feeding of their components and their systems, and that includes making sure that the PM program properly supports their equipment and systems, that the operators don't abuse it, and the whole thing. And I think that will go a long way toward enhancing the engineering support of the plant, which I considered to be weak.

[Slide.]

In summary, the major changes within the nuclear mission. We have come to the conclusion that we need approximately 930 people instead of the 390 presently allotted to the station to increase the engineering effort and also, for the new planning and scheduling. And our quality assurance and quality control organization is taking on the balance of the plant, and that's going to take some additional people there. And then throughout, we're going to shift people, shift chemists, so that organization has been beefed

up a bit. A total of 930.

Most importantly has been an adjustment in the salaries to make Davis Besse competitive. We have agreement on what the adjustments will be, what level we will be taking the whole organization to. We're working out now the details of how we implement that. It will probably be a two-step program. There's too much for an elephant to bite at one time. And as we bring in people and organize we'll get these people competitive. I'll be able to hire at a competitive level. And as I said, the Assistant Vice President, Nuclear is concentrating on security, administration and personnel.

[Commissioner Bernthal joins the meeting.]

COMMISSIONER ASSELSTINE: On the new people, how many of those are realigning functions and responsibilities within the existing organization?

MR. WILLIAMS: Well, the 690 to 930, 240 will be new people. I can't get all those aboard by December. My goal is December of 1986, and that is an ambitious recruiting campaign to get the talent. In the meantime, I will fill from Bechtel or Stone & Webster or wherever I can get a competent engineer, and I will move him into the seat. If it ends up he is a good man and he wants to say, I will hire him, but, you know.

COMMISSIONER ROBERTS: That is a 35 percent increase. Did you have any difficulty persuading Mr. Williamson of the necessity of doing that?

MR. WILLIAMS: No, not really because when you look at the effort that is going to -- or the money that is being paid consultants to do that same type of thing over whom you have no account, you know, you pay those people twice as much.

MR. WILLIAMSON: Admiral Williams persuaded me it would be more effective, both cost-wise and management-wise, to do the work in-house rather than out-house.

COMMISSIONER BERNTHAL: A million dollars a day for plant down time is worth a lot of money.

MR. WILLIAMS: Position descriptions. You know, you don't have the right to bring a guy in and ask him to work for you unless he knows exactly what it is he is supposed to be doing, and I believe in detailed position descriptions, and they will be completed next week, at least for my first brush with them, and that is for all 930 positions.

The new Commission personnel are being moved to the site. We had about 50 people in downtown Toledo engineering, and this says Material Supports personnel, and they are, too, but also the engineering people are being moved out there. We have had to go into a trailer complex to accommodate those people for the present, but it's a nice trailer complex, and I don't like trailers on site, but you have got to do with what you have got to do, and they will be occupying that by the end of this month.

We have a new plant manager in place. The position

of Assistant Plant Manager-Operation has been established and filled.

[Slide]

The position of Assistant Plant Manager-Maintenance has been established, and an experienced maintenance manager has been hired for that position. The Maintenance Department has been completely reorganized. It has been enlarged, and experienced personnel have been hired for the key positions, and the position of Materials Manager has been established.

We have a new centralized planning department, as I refer to, and the previous plant manager assumed the duties as head of the expanding Engineering Division, and are increasing our staffing in engineering.

When I got there, I found a plethora of to-do items, just a bit to-do list that reflected the SALP problems that were surfaced in the last SALP report, and also the performance enhancement program that Toledo Edison had generated that was surfacing a lot of the issues that we are addressing here and correcting.

But there was just too much on the plate, and I have reassigned the priorities of all of those issues, and the ones that you see here on this slide are the ones that are going to get the most emphasis and the most resources. When you read the course of action, you will see the second category are those that were well along and it didn't make any sense to

terminate them.

The third category is of lesser priority. Now gentlemen, that doesn't mean we are not going to pursue those, but we are going to pursue them in the due course of doing business.

[Slide.]

I have already talked about the position descriptions and the merit review and salary administration program, and that has moved very rapidly and we have come to conclusion on that.

Configuration management is the really big swinger.

[Slide.] That is a multi-million dollar program that will do these things for me. It will give me component system data base of what I have in the plant, verify that. It will provide system descriptions that give our operators the design basis for the operation of those systems. It will validate our vendor manuals, give us control of drawings and manuals, and it will give us a very accurate spare parts allowance.

[Slide.]

Now, in the interim we have to do something about the spare parts allowance, so we have hired some engineers that are competent to do that type of thing and they have done it, to come in and review our vendor manuals and come up with recommendations on the spare part additions that I will do

now. And we will have some waste here because when I get on down to the final line, I will find that there were some things that these people recommended that my configuration management program doesn't show I needed, but that is downstream and I have to do something in the interim.

Management training. We need that --

COMMISSIONER ASSELSTINE: Before you leave configuration management, that is obviously not the kind of thing that can be done overnight. What kind of time frame are you looking at?

MR. WILLIAMS: Our RFP should have already been on the street, but it is not written just like I want it. It should be on the street by the first of November, and we should have that completed in its entirety by the end of 1987.

COMMISSIONER ASSELSTINE: So you are going to contract out?

MR. WILLIAMS: I'm going for prime contractor, will probably have some subs under him. I'm going to put it out so people can bid on different parts of it and I can determine who will be the sub and who will be the prime and just get the best people we can and move as fast as we can on that area, but that is really a multi-million dollar project, and I will probably bring somebody inhouse to manage that contract who knows that configuration management better than we know configuration management.

COMMISSIONER ROBERTS: What type of organization would the prime be, not by name but --

MR. WILLIAMS: It could be an architect engineering firm.

COMMISSIONER ASSELSTINE: Although I take it one of your objectives is to make sure that from now on you have the drawings, you maintain control of them, it is your plant and your drawings and you know what is there.

MR. WILLIAMS: That's right. Now, those will be moved out and we will have all of our stuff out of Gaithersburg by the end of the year. I won't wait for the configuration management to move that out and start controlling our own drawings. It's just the validation and making sure that what we have on the record reflects what is in the plant is a big effort, but we are in the process now of moving not only the engineering support that Bechtel gives out from Gaithersburg to the station but also moving all of our data from there to the station, and we do have the room to store it properly.

[Slide]

Management training is important, and there they had a management by objectives program that was in place when I got there, and of course, the foundation for that kind of a program, it really starts with position descriptions, and I will continue that.

Fire protection. I will say we are in hot pursuit, in risk of a pun, of our compliance with Appendix R, and we have a ways to go, but we know what needs to be done and we are going to go do it.

Nuclear mission procedures. We need site-wide --

CHAIRMAN PALLADINO: When are you going to do that?

MR. WILLIAMS: It is programmed out. I am having them change it now. It was stretched out, and we are pulling a lot of those things that need to be done back into 1986 and 1987. When am I going to be in compliance with Appendix R? I can't give you that date today, but we are working very closely with Region III. If I am hot in pursuit of Appendix R, they are hot in pursuit of me in pursuit of Appendix R. I might put it that way.

[Laughter.]

COMMISSIONER ASSELSTINE: Joe, could you highlight maybe a couple of the more significant items under fire protection that you still have to do?

MR. WILLIAMS: I'm going to let Mr. Wood step up to bat on that one.

MR. WOOD: I think we have a number of fire dampers that we are reevaluating, a number of fire barriers that need to be looked at and upgraded as necessary, and we also have some cable routing to consider for protection or for rerouting.

COMMISSIONER ASSELSTINE: For alternate shutdown capability?

MR. WOOD: That's right.

MR. WILLIAMS: We also installed a sprinkler system eight feet off the deck, but we are not sure that it properly reflects the heat so that you will get the action of the sprinkler heads, and that is under review also. A lot to do.

Nuclear mission procedures. We did not have site-wide procedures that are uniform, and there is some conflict in administrative procedures, and I have told Mr. Williamson that we are going to cut down on the consultants. I have the people in here now writing procedures, and we had to resort to that, but we need good site-wide procedures.

QA awareness program. We are cranking that into the training program so that people are aware of the need for QA. Non-outage work prioritization. We have a work prioritization committee, and this is a function, of course, of the new scheduling and planning group, and we have the STAs to assume the interim EDO functions.

COMMISSIONER ASSELSTINE: Could you explain that last one a little bit?

MR. WILLIAMS: Yes, sir. It will be explained a little further later on.

COMMISSIONER ASSELSTINE: We l, that will be fine.

MR. WILLIAMS: Well, the idea is that the shift supervisor in times of emergency is hard pressed to keep up with everything. We just felt that it was a good thing for the STA to be the emergency duty officer or interim emergency duty officer. But if we would train him in that role, that he would be a real valuable adviser to the shift supervisor and take a lot of that load off of him in the first heat of battle, such as happened on the night of June 9th, and at that time, our STA was somewhat removed from the place. He is in very close proximity now.

COMMISSIONER ASSELSTINE: More an integral part of the shift now than they used to be.

MR. WILLIAMS: He just has another function there, specifically.

I would like to have the assistant plant manager for maintenance now discuss the improvements in the maintenance program, Mr. Chairman. That is Mr. Steve Smith.

[Slide.]

MR. SMITH: Thank you, Admiral, Mr. Chairman, Commissioners.

The maintenance improvement program currently involves changes and improvements in many broad areas, and major areas affected are organization and staffing, training, administrative and technical procedures, preventive maintenance, spare parts and material control, engineering

interface and support, plant cleanliness and material readiness, and new facilities.

To assure that our new philosophies and our new programs and concepts are brought together and all maintenance department personnel clearly understand the duties and responsibilities, the position descriptions, along with our new management policies, are being incorporated in the procedure which I call conduct and maintenance activities.

This procedure is currently in its draft stage, and I intend for the procedure to be approved and implemented by October 15th of this year, at which time training will be conducted for all maintenance personnel.

CHAIRMAN PALLADINO: You list facilities. Are you building some new training facilities?

MR. SMITH: Yes, sir.

MR. WILLIAMS: We have a slide on that.

CHAIRMAN PALLADINO: I will wait.

MR. SMITH: The maintenance organization itself --

CHAIRMAN PALLADINO: Now, are the facilities going to be completed by the 15th?

MR. SMITH: No, sir. Just the procedures.

[Slide]

The maintenance organization itself has been realigned to perform two specific activities: that is, to provide adequate supervision, increased supervision to assure

the correct conduct of maintenance activities in the field and to provide a small technical staff that will be the parent body for maintenance technical procedures and for minor maintenance technical problem resolution.

The dotted line blocks that you see are new positions within the maintenance department. The ones with the dark hatch in the corner are those that are realigned to higher planes of supervision. New men brought in from the outside in the maintenance organization are myself, the maintenance superintendent of instrument control, the general foreman mechanical, and the mechanical maintenance superintendent.

[Slide.]

I have realigned certain personnel within the group, promoted certain personnel, upgraded other personnel. The new composite maintenance experience within the organization is 155 years nuclear and power plant experience. Within that 155 years, we have 60 years of commercial nuclear plant experience.

The maintenance organization of new management personnel are intended to accomplish several things, but more important is improved communication both within the group and within our facing organizations. To assure that communication exists, I have increased the number of first line supervisory personnel in the mechanical area to one to ten craft persons.

It was originally one to twenty-three. In the electrical area it is one to six. It was one to twenty-six. In the I&C area it is one to seven. It was one to nineteen.

These people each have direct supervisory responsibilities in the plant, are required to spend 75 percent of the working day in the plant with the personnel supervising activities. They each have a prime collateral duty, some of which I will get into later.

To assure that I set the pace for communications within the maintenance department, I meet daily with my superintendents, the general foremen and the lead engineers. I meet weekly with all the foremen and the shop stewards. We are a labor-organized organization.

I meet monthly with each discipline in their department, and I meet quarterly with the entire department. The superintendents themselves have an additional schedule for meeting with their people.

COMMISSIONER ROBERTS: Did you encounter any difficulty with your bargaining unit on changing these ratios?

MR. SMITH: Yes, sir, I did. They had a union position called group leader which had been responsible for the supervision of maintenance activities in the plant, and those individuals thought that their authority had been usurped somewhat. I have redirected their authorities and responsibilities to the training area and have outlined a

program where they can be of much more benefit with their wealth of knowledge and experience, and I have outlined the reasons for the increase in management staff in the plant, which is actually a help for them. We can communicate better with supervisory organizations outside the maintenance department and cut away the logistical interference for getting work done.

COMMISSIONER ASSELSTINE: In terms of your ratios and in terms of your requirements that they spend 75 percent out in the plant, how does that translate in terms of the amount of ongoing work that they are able to at least observe to some extent?

MR. SMITH: It is my observation, I have it on paper right now, that we are increased the amount of the work done in the field by a factor of three.

COMMISSIONER ASSELSTINE: Would that, say, mean that your supervisors would be out there actually seeing say 50 percent of what's going on in terms of individual jobs or --

MR. SMITH: Basically. They rotate between two to four crews. Bear in mind now that just the increase in the supervisory staff is not the reason why we have improved our work performance. We have a centralized planning group that takes care of a great deal of the paper work burden for the foreman, the paper work flow to the field, and communications with the operations department has improved

immensely. We have vast engineering support where we did not have it before.

The entire organization is working together to move the work into the field and ensure that we are ready to do the work.

In the area of training for the maintenance side, I have established an organization and directors within the organization to be sure that we identify and establish a schedule and meet our training needs.

To this end, I have a foreman in each discipline who is designated as the training foreman, and his sole responsibility is to ensure that the training schedule is met by our personnel, to monitor the program performance within the training program, and to coordinate in-shop training.

I have established training shifts with each discipline. Those shifts are comprised of craft and supervisory personnel. They are dedicated for a period of time each year into the training program. Their sole job and function is to attend training and complete that training.

To assure that we have adequate feedback and craft input into the training program, I have established training councils within each discipline. Those councils are composed of craft personnel on a ratio of 1-to-10 for that discipline. The training foreman is a member of that council, and the training discipline supervisor is additionally a member of

that council.

That council reports directly to me and the training director. They make recommendations for the type courses to be taught. They assess the quality of the courses that are being taught, and they help us to develop a training schedule.

Where appropriate, we are using outside organizations and facilities to augment our training facility, such as Babcock & Wilcox, vendors and other utilities. Currently we are using the facilities of Commonwealth Edison. We have mechanical, electrical and instrumentation control personnel right there at this time attending portions of training, until such time as our training courses are fully developed and implemented at the site.

COMMISSIONER ASSELSTINE: Steve, there's obviously some sort of dynamic tension between the amount of work that you've got going on at the plant and the objective of being able to devote more time to training these people. Is this like a longer term effort, or are you really achieving --

MR. SMITH: This is ongoing right now. I have established that our training schedule will be met. We have gone to outside contract organizations to augment our maintenance staff in the plant. We are meeting our work schedule with contractor augmentation. We are using additional Toledo Edison maintenance personnel from some of our fossil facilities that do have experienced personnel,

experienced at Davis Besse. We are meeting both needs and will continue to meet both needs.

I have budgeted for 1986 and will continue to budget 20 percent of our manpower to training all the time. Our schedule works out to be 48 weeks a year maintenance will be in training.

MR. WILLIAMS: Dave Bleddo was sending those people over to Chicago to Commonwealth Edison, but they sent them.

COMMISSIONER ZECH: Let me just say, too, I think your emphasis on maintenance is certainly appropriate, and also your emphasis on training and the establishment of a nuclear training director at a higher level, I think is certainly the right way to go.

What I would like to hear from the maintenance head is as far as maintenance is concerned, you've got to work very closely with your operational people.

MR. SMITH: Yes, sir.

COMMISSIONER ZECH: Now, how do you accommodate ensuring that your maintenance fits in with your operational schedule during the time the plant is running at 100 percent power, for example?

MR. SMITH: The advantage of having a centralized planning and scheduling organization is that within that organization are SRO people, actually licensed people in the plant. That organization actually is the driver, as far as

schedule is concerned.

COMMISSIONER ZECH: Who is in charge?

MR. SMITH: Mr. Mike Shefers, who reports directly to the plant manager. He speaks for the plant manager on schedule decisions.

COMMISSIONER ZECH: But I mean who is in charge of whether something is going to be -- some maintenance operation is going to be placed in effect, or whether it is going to be delayed? Who has the final decision on a maintenance item during plant operations?

MR. SMITH: That's a difficult question to answer in that operations has input to that schedule, maintenance has input to that schedule, engineering has input.

COMMISSIONER ZECH: But who's in charge?

MR. WILLIAMS: It really comes down to the plant manager.

COMMISSIONER ZECH: I hope so.

MR. WILLIAMS: Well, you know, the plant scheduler says I want to do these things at the plan-of-the-day meeting, and the people say no, you're not going to do them, and the plant manager has to step up and say either yes, you don't do them, or yes, you do do them.

COMMISSIONER ZECH: Well, you have emphasized maintenance, and it sounds like in a very strong and healthy way, and I commend you for that.

On the other hand, you've got to have somebody in charge.

MR. WILLIAMS: That's right. No, no, he's not a loose cannon.

COMMISSIONER ZECH: Good. He's very enthusiastic, I can tell, and I just wanted to make sure that somebody's got control of it.

MR. WILLIAMS: Yes, sir.

[Laughter.]

MR. SMITH: In the area of administrative and technical procedures, we have established an upgraded program that commenced this month. We now have four people on site. Effective Monday, we will have four more people on site. That cadre of personnel are immediately involved with the upgrade of the administrative department or the administrative procedures for the maintenance department.

We intend to do several things with this effort:

One is to incorporate NRC, INPO and industry guidance into our administrative program.

We are going to establish formal feedback mechanisms within the administrative controls to ensure that the craft personnel experience in the plant is evolved back into the procedure as ongoing procedure improvement.

We want to improve our technical procedures, both technically and in the "doer" fashion. To that end, we have

included in the staff of personnel a human factors engineer. He is presently assessing the format of our procedures. We are going to reformat the procedure for each discipline to assure that it works specifically for that discipline, and that the work flow through the procedure is correct and will permit quality work in the plant.

I have established in a directive at this time that any revisions to existing procedures or any new procedures created until such time as we have the program fully rolling will be reviewed by craft personnel and their comments resolved prior to my approval of the procedure and its submittal for plant approval.

This effort will involve approximately 100 administrative procedures and approximately 1500 technical procedures.

MR. WILLIAMS: Steve, I'm going to break in, if you don't mind, Mr. Chairman. I want to move along. He's provided for a systems engineering group to provide the preventive maintenance input to upgrade our preventive maintenance program.

The spare parts and material control in the next one is being addressed in an interim fashion by bringing in the engineers I was talking about to give us a purification of the spare parts system, at least on an interim basis.

Steve has also written the directives for the

engineering interface, to make sure that he gets the proper support and that engineering knows what support he needs.

Now, Steve, I'd like you to take that next one, plant cleanliness and material readiness, back away from me, would you, please.

MR. SMITH: Yes, sir. In the area of plant cleanliness and material readiness, we have two concurrent programs in place. I have a composite crew that is devoted to walking down the plant, identifying plant cleanliness and material readiness items.

The crew consists of mechanics, electricians, I&C personnel in our station services organization, which is the janitorial service. The size of the crew is approximately 30 people. Their supervisor reports directly to me. They are responsible for correcting minor problems when they are found. They initiate maintenance work requests for those that they cannot correct, and they establish a schedule and conduct cleaning in the plant based on the priorities for those areas in the plant.

Additionally, each member of my staff, which is approximately 38 individuals, is responsible for doing inspections in the plant. We are building a very large backlog of plant cleanliness and material readiness activities. I intend to do this. I have given specific guidance for this to happen.

This backlog of work will be prioritized and scheduled on a weekly basis into the plant for composite work crew of mechanics, electricians, I&C people and station service men. This crew will have a prime responsibility of being what I call the "do it now" force. They will report directly to the shift supervisor and respond to his operational needs in the plant. In order to keep them productive, they will work on this backlog of work when they are not performing functions for the shift supervisor.

COMMISSIONER ROBERTS: What is your backlog now?

MR. SMITH: There actually are two backlogs. The backlog of work that existed on 6/19/85 was 969 corrective maintenance work orders. We have to this date accomplished 663 of those work orders, leaving 306 which are being factored into the schedule at this time.

We have initiated an additional 1431 work orders. Of those, we have worked off 486 to date.

In the area of preventive maintenance, we have a current backlog of 138 preventive maintenance activities. 46 of those are in the process of being worked at this time. 21 more are on schedule to be worked. The additional would be worked prior to start-up.

MR. WILLIAMS: The new maintenance facilities that are being provided, Steve, includes a five-story structure on which we have broken ground. We are probably putting in steel

today, and we will be into that building next November or next October. It's a five-story structure, 100 square feet, and it gives the shop facilities a really modern well-equipped machine shop, electrical shop and an I&C shop.

It also has facilities for the quality control and for the engineers that are direct support of the plant. It's a patch to the present station building, with access directly into the plant.

CHAIRMAN PALLADINO: What interim facilities do you have for training maintenance people?

MR. WILLIAMS: Well, the training area -- we have a very good training facility that is coming into being. The square footage -- it is astounding to me how much room they hae down there. There are three laboratories that are being constructed in that building. They will be complete in December.

CHAIRMAN PALLADINO: You are talking about the new building?

MR. WILLIAMS: No, sir, that's a separate building. The training laboratories are down in the training building. These are actual workshops, well-equipped workshops. But the training laboratories -- and we will be speaking to them later in the training section -- are being installed in a building that is outside the controlled area.

MR. WILLIAMSON: Mr. Chairman, we have two buildings

we are talking about, really; the shop facility building is one that we have been planning for two years now, and have broken ground and are underway. It is attached right to the main part of the plant itself, so it will provide large shop facilities to what we have, as well as processing facilities, to bring people in and out.

The other building is a separate training building, two-story, very large building. The entire second floor of that building is devoted to training, classrooms, facilities, plus part of the first floor has laboratories.

I think it is very important that people get hands-on training in things.

CHAIRMAN PALLADINO: Do you have mock-ups or --

MR. WILLIAMSON: Yes.

MR. WILLIAMS: There will be. They are being installed now.

Now I would like to turn our direction to the specific events of September -- June the 9th --

COMMISSIONER ASSELSTINE: Just before we do that, I have just a couple more questions, if I could.

One was, could you give me -- you talked about the backlog, cutting down the backlog. How does that translate in terms of say equipment that's been out of service for long periods of time? Are you focusing on the stuff that's been out, whether for spare parts reasons or whatever, has been out

for a good period of time?

MR. SMITH: Yes, sir. We have established new priorities. Those priorities include items such as safety-related equipment, fire protection, security equipment, personnel safety items, and those things that have been outstanding for long periods of time due to the fact that they were not essential for plant operations, but they are a long term maintenance conditions.

In our water treatment facility, we have an intensive effort to remove no longer needed systems, to improve the cleanliness in the area and the operability of the system. That facility is near completion at this time and looking very good.

We are directing ourselves at all the material, equipment type items in the plant, and that program is coming along very well.

COMMISSIONER ASSELSTINE: How are you doing on equipment that's out of service in the control room?

MR. SMITH: We are working very intensely in the control room to --

MR. WILLIAMS: What did you say about the enunciators? They will all be clear by start-up?

MR. SMITH: Except for the ones that have to be left due to system alignment, they're going to be clear in the control room.

MR. WILLIAMS: Lifted lead and wire log is being attacked vigorously also, as is the instrument air, which you asked the last time we were out there.

All of these maintenance things are going into place. You realize this has only been going on about six or seven weeks now, and you said you have a mature, glossy system out there, the answer is no. You know, we are -- this is all being done in parallel and there's a lot of things going on, and it will be a while before things get to where we are satisfied that we have in place everything that we want, and that it is working the way we want, and this takes a little bit of time.

COMMISSIONER ASSELSTINE: You talked also about upgrading your maintenance procedure for different pieces of equipment. Could you talk a little bit about where you stand in upgrading your maintenance procedure for safety-related valves?

MR. SMITH: The program for upgrading those procedures is --

MR. WILLIAMS: Safety-related valves.

MR. SMITH: Yes. First, we have to create the administrative controls and approve our administrative controls. The first one is the development and approval of procedures and that's the one we are working on right now.

It is our intent to complete the administrative

controls portion prior to the end of the year and start the massive technical upgrading program. There are several reasons for that. We are allowing the systems engineering review group to get their effort underway. We will come in behind them and we will be pacing each other in the upgraded procedures.

Some of the informational fall-out from the system review is going to help us upgrade our technical procedures.

MR. WILLIAMS: The Limitorque valve procedures that we had to go -- they were a result of Mr. John Woods' group. Those are specially developed procedures to go in and to adjust those Limitorque valves. So whenever we run into a problem like that in the "get well" program, that is a separate issue, and that procedure is addressed right then, but it's addressed by the technical group agreed to by maintenance. And it is not one of the routine things as of yore. It will be in the future, okay?

May I go on, sir?

COMMISSIONER ASSELSTINE: Yes. That's all.

MR. WILLIAMS: On June the 9th event is the next area I'd like to address, and I'd like Mr. John Wood, who has headed up the effort that was manned by Toledo Edison engineers and also the best talent that we could find throughout the nation to bring in to work on these individual problems. And, Mr. Wood.

MR. WOOD: Thank you, Admiral, Mr. Chairman, Commissioners.

The 6/9 sequence of events involved a number of equipment concerns or anomalies. These concerns were addressed using guidelines developed with cooperation with the NRC fact-finding team.

I am going to present on the next page then the basic process that was used. We subjected an investigating and trouble-shooting routine using detailed action plans which were again reviewed with the NRC fact-finding team to these specific concerns that generated findings, root causes, that allowed us to appropriately identify what corrective actions and generic implications were involved.

Now, what you are going to find on the following slides are items addressing each one of these.

The generic implications are specific to Davis Besse equipment, not industry generic implications. Also some of the programmatic generic implications, such as maintenance, training, testing and operator actions are addressed in other elements of the program.

[Slide.]

MR. WOOD: The concern was the overspeed tripping of the number one main feed pump turbine, which initiated the plant runback which then resulted in the reactor trip. We found in our investigation that there was a failed circuit

board capacitor in the General Electric control system. This control system had been newly installed in a previous refueling outage. Here, very simply, we are going to replace the faulty board and also continue the checkout and testing of he controls for both main feed pump turbines.

[Slide.]

The next item is the steam feedwater rupture control system, which had a spurious actuation and closed both main steam isolation valves, thus isolating team to the main feed pump turbines. Here we have found in our investigations that the turbine trip caused the pressure oscillations, which then the system recognized as a low steam generator level situation.

Now, this oscillation is caused when the massive turbine stop valves slam shut under full flow conditions. It sets up an oscillation within the secondary side. We have made some changes in the last refueling outage on some level transmitters which had caused a more responsive level tap. That more responsive situation then allowed the oscillations to be detected, and then the system responded inappropriately.

Here we have fixed this or intend to fix it by adding electronic filtering to the input signals to prevent this from happening in the future.

[Slide]

The next item is the auxiliary feed pump turbines.

COMMISSIONER ASSELSTINE: On the SFAR system, I take it that you are pretty well satisfied that there aren't any broader questions or implications about the reliability?

MR. WILLIAMS: No, sir. There are some things that we wish to change about it, but that will be addressed later by Mr. James, who headed up the decay heat removal.

MR. WOOD: The next item was the auxiliary feed pump turbines, which had tripped on overspeed. This, of course, prevented the backup supply of water to the steam generators. It has been our determination through our investigations that this was caused by condensation in our long steam inlet lines, in which condensation forms in these lines as the lines warm up from the ambient using the hot steam, and this then disrupts the proper turbine control.

We intend to correct this by keeping the lines hot with steam to greatly reduce the water formation. We are also going to improve the governor controls on our number one turbine to be identical to our number two turbine, which was changed out in our last refueling outage.

MR. WILLIAMS: That's one of our big swingers. When we move that steam valve down next to the turbines, it makes that entire steam line then -- you have to consider it from a high energy break. Bechtel has done the analysis on that, and we have some of the whips or some of the supports, new ones that will have to be put in, designed. The control valves are

on order and we will be moving them down, but we are taking care of the high energy line considerations at the same time.

[Slide]

MR. WOOD: Continuing on, we have the auxiliary feed pump turbine trip and throttle valves. Now, the operators experienced problems when they went down into the rooms and tried to reset these valves. We have found that our procedures and our prior training were not entirely sufficient, and to correct that, we are providing improved hands-on training with actual full steam pressure at the valves.

We are also giving the operators additional help by providing placards and local indicators so that they have better indication at the equipment as to their situation. We are also enhancing communications in the pump rooms.

You should note that under generic implications here, there can be other crucial operator actions such as resetting of the emergency diesel generators, for instance, that need to be performed locally. This area was looked at by our operator actions review group that Bill Connor will be talking to later.

COMMISSIONER ASSELSTINE: How do you enhance communications both between the pump rooms and up to the control room?

MR. WOOD: Prior to this, we had one Gaitronics

station in the number two room, and we are putting an additional Gaitronics station in the number one room so that they can communicate between each other and also to the control room.

Next we have the auxiliary feedwater valves, AF599 and 608. These valves failed to open on demand after closing earlier. They closed earlier when the operator incorrectly pushed the top buttons on the auxiliary feedwater initiation buttons. This should have been corrected, however, when he went back a minute or so later and reset the buttons. The valves, however, failed to open.

This gets into our motor operator problems that Steve mentioned just a short while ago. The valves were allowed to torque out before opening. We are moving the MOVATS system to go in and readjust, and we will have the ability then to verify that the settings are correct.

This is, of course, applicable to other motor operated valves in our plant.

[Slide.]

The next is a pilot operated relief valve, or the PORV. During the transient, the PORV failed to close properly after its third opening. However, the operator had closed the block valve and isolated the PORV, thus shutting off flow. He went back a couple minutes later, reopened the block valve, found that the PORV was still closed. So it was not defined

at that point whether the PORV actually was in a failure mode.

We disassembled the valve, found no physical evidence to explain the improper closure. However, we cannot rule out poor material in the pilot. We find that the Davis-Besse record on our PORV operations is similar to industry experience, and I think the bottom line is there that the PORV is not 100 percent reliable and you have to be able to design your plant to accommodate occasional failure to close.

CHAIRMAN PALLADINO: Were you looking into the characteristics of the PORVs with regard to cycling? Is there some aspect of cycling that influences the effectiveness of the valve?

MR. WOOD: We are looking into the testing that will give us additional information regarding cycling, yes, sir.

COMMISSIONER ASSELSTINE: And specifically in terms of that, are you going to do tests on the valve, or at least a similar valve that cycles and also that uses both steam and water going through it to see whether that's a problem?

MR. WOOD: We are currently developing a test program in cooperation with the Duke Power Company using the Marshall facility and some of the EPRI valves that were used there, and we will be getting that under way in a short fashion.

MR. WILLIAMS: And we will be doing confirmatory

action testing on the rebuilding of the one that we have; is that not right?

MR. WOOD: That's correct.

COMMISSIONER ASSELSTINE: So that would really go beyond the EPRI's testing that has been done so far. So in a sense that may be useful generically. You may have the only kind of this particular valve, but I suspect the information will be useful to everybody that has PORVs.

MR. WOOD: That is correct, and it is also our intent to test other valves besides the one that we have.

[Slide.]

The main steam headers is the next item. We had some pressure control problems experienced on the main steam headers. We found this to be actuation of the atmospheric vent valves, which took the header pressure down. We are correcting this by adjusting and checking out the atmospheric vent valve control circuitry.

Part of the reason for the manual actuation of the atmospheric vent valves is the operator's uncertainty over the main steam safety valve performance, so we will also be testing the main steam safety valves and refurbishing them as needed so that the operators have confidence in that equipment.

COMMISSIONER BERNTHAL: I have one question about the previous point on the PORV. Refresh my memory for me. As

we all recall, in the Three Mile Island incident, to be sure, it was a problem that the valves stuck open, but in my judgment, an even greater problem, whether it is this valve or a pump or whatever it is, is lack of information, positive information about what really is happening.

I seem to recall -- and again in this case you did not have positive information. You only had, at best, indirect information on whether the valve really was open or shut. Is that the case? And I trust that -- you can do a lot with mitigation and operator action, but only if you are getting information. That surprised me way back in '79 and it continues to surprise me.

MR. WOOD: The second bullet under corrective actions are the acoustic monitor.

COMMISSIONER BERNTHAL: I assume that is --

MR. WOOD: That is the direct indication that there is flow out of the PORV. Now, the situation here was that that indication was not in the direct line of sight of the operator at his panel but it was off to the side. The operator correctly closed the block valve during the transient, but that was in response to system characteristics, which were appropriate.

COMMISSIONER BERNTHAL: Yes, exactly.

MR. WOOD: Here, we are moving lights from that post-accident monitoring system directly onto the panel so

that he will have that direct line of sight information available to him. So we will have a more unambiguous direct indication.

COMMISSIONER BERNTHAL: Is that kind of effort -- I probably ought to ask our staff, but at least in your plant, are you at some point, at least, down the line, perhaps systematically going through to make sure that whether or not something works, at least you know whether it worked or not, that you are getting the information whether or not there is a mechanical failure, in fact?

MR. WOOD: Yes, that is part of our control room design study.

MR. WILLIAMS: We have a human engineering program for control room design that is ongoing, and we will be picking that up and bringing those into the fore.

[Slide.]

MR. WOOD: I want to move on to the main feedwater startup control valve. When the operators put on the startup feed pump, they needed to open SP-7A or its sister valve, 7B. They were uncertain as to the status of it due to a blown light bulb. Here there was no significant finding and it was actually just a blown light bulb that has been corrected.

[Slide.]

Next we have the auxiliary feed pump --

CHAIRMAN PALLADINO: What was it, a blown light

bulb?

MR. WILLIAMS: Yes, sir. There was no indication. Another thing that flowed out of that, too, he asked them to go back and determine what was wrong, and they determined the light bulb was blown, and then when he started replacing it, he also put a six volt in a 120 volt circuit, and that blew, and so we have put some labels up that say, essentially, don't put six volt light bulbs in 120 volt circuits.

[Laughter.]

MR. WOOD: And the next, auxiliary feed pump number one suction supply. We had that pump suction transferred to the backup water supply, which is service water, which is raw lake water, and that is an undesirable feature. We have found, though, that there was no impact to the steam generator from water chemistry checks.

Also, the transfer took place because of, again, a transfer or a transient condition. When you disrupt the flow or suddenly introduce flow, you can set up oscillation again. Sensitive instrumentation picks that up and makes a transfer.

In order to improve the hydraulics, we are going to remove and replace strainers as appropriate. We are also improving the circuitry by revising the transfer switch setpoints and providing a time delay to take some of that sensitivity that is not needed out of the circuitry.

We have Valve MS-106, which is used to emit steam from steam generator No. 1 to aux feed pump turbine No. 1.

[Slide.]

This valve -- it indicated a stroking in a much faster time than the water should have with the seal-in circuitry. We found here again that the motor operator on the valve was not properly adjusted and falls into the same category as the other motor operated valves we discussed.

COMMISSIONER ASSELSTINE: Are you confident, both in this case and in the previous ones now, that what you have done to look at the motor operated valves, the use of the MOVATS machine, that that is going to resolve some of the uncertainty that had existed before about what is needed to be done both to maintain and to assure proper setpoints for the motor operated valves?

MR. WOOD: Most certainly it will take care of much of that uncertainty.

MR. WILLIAMS: And we are going to do the confirmatory testing on that to make sure that they do operate properly with the differential pressure.

COMMISSIONER ASSELSTINE: Are you doing all your motor operated valves and not just these?

MR. WILLIAMS: We are doing all of them in the safety systems and we will do the others -- Steve, when do you plan to get to the others?

MR. SMITH: It is an ongoing schedule that will take us through 1986.

MR. WILLIAMS: It will be done before startup.

CHAIRMAN PALLADINO: I'm sorry. What?

MR. WILLIAMS: All safety-related motor operated valves will be done before we request permission to start up, or before startup.

COMMISSIONER ASSELSTINE: That is what, 180 of them?

MR. WOOD: 166 is a ballpark number.

CHAIRMAN PALLADINO: I was just going to ask you how much of these things are going to be done before restart.

MR. WILLIAMS: They will all be done before restart, yes, sir.

CHAIRMAN PALLADINO: And what was this about 1988?

MR. WILLIAMS: The nonsafety ones. We have a lot of motor operated valves throughout the plant that are not in safety systems and that really, we feel, are not required for startup, but they will be on a continuing program of checking those.

CHAIRMAN PALLADINO: I guess my concern is that the so-called non-safety valves generally and inevitably have some impact on the plant. Is there any interaction between these systems that causes concern?

MR. WILLIAMS: Well, we will do them as rapidly as possible, Mr. Chairman, and we've got MOVATS teams in there

and our own teams. We bought one of these sets and when we get through with it then we'll rent it out to the rest of industry to get my money back.

[Laughter.]

CHAIRMAN PALLADINO: Well, my question is actually broader. We have all sorts of procedures here that you're revising, you have a new organizational setup, you've got new things underway with regard to maintenance. You have corrective actions on specific components. And I guess in the end what I'd like to get a feel for is what are you planning to do of these before restart, and how can you get away with stopping wherever you're going to stop?

MR. WILLIAMS: The next presentation you will see is one that a concern was raised the day after the event when we set in motion the action to determine what systems needed reviewing based on the June 9 event, and we have review groups set up. There are about 50 engineers working in this area that are reviewing the history of these systems and determining what confidence we can place and what kind of testing we need to do, what kind of corrective action we need to do, what additional preventative maintenance we might need to do to assure ourselves that those systems that we consider to be essential for startup are, in fact, operable when we -- before we decide to start up. And that's the next presentation.

CHAIRMAN PALLADINO: Okay.

COMMISSIONER ASSELSTINE: Joe, just for a point of reference, you said there are about 166 safety-related motor-operated valves. How many do you have that are non-safety related? A ballpark.

MR. SMITH: About 110.

COMMISSIONER ASSELSTINE: 100 more? Okay. Thanks.

MR. WOOD: Okay, continuing on, the nuclear instrumentation and nuclear source range detectors. Prior to the event, one channel was inoperable and the second failed during the transient. Now this caused the operators additional confusion during an already confusing situation. Here we have found through much trial and tribulation that the NI-1 system had an inadequate ground at the shield, or the shield found at the pre-amp. Number 2 had an intermittent failure of the containment penetration, and we have corrected both these situations to restore these components.

CHAIRMAN PALLADINO: What were those due to? Inadequate maintenance?

MR. WILLIAMS: Yes, sir. It's a very difficult -- those are triaxial cables and the fittings on those, there are just many, many of these fittings. They are very difficult to make, and it takes a well-trained man, and even then he can get into problems with them. And if you go back to the history, you know, they just weren't installed properly. And

at this installation here, we've had our troubles getting them installed with the vendor in there giving us a hand. It's a difficult thing to do.

COMMISSIONER ASSELSTINE: Does this mean on the second one where the thing had worked and sometimes it wouldn't work, that you understand now what was wrong with it and from now on it's going to work?

MR. WOOD: We believe we do, sir.

MR. WILLIAMS: From now on?

COMMISSIONER ASSELSTINE: Well, you're not going to have those intermittent failure problems.

MR. WILLIAMS: No, sir.

MR. WOOD: We should realize that these are very low signal systems and it's very hard to maintain this system in 100 percent working capacity.

COMMISSIONER ASSELSTINE: Well, I know you've been looking at the intermittent failure problem. I was just having difficulty understanding what it was.

MR. WILLIAMS: Well, there was a plethora of things that were not making it work.

MR. WOOD: In fact, this information is new to the Staff as well because we have just found it since our discussion with the Staff.

[Slide.]

The next one, the turbine bypass valve. This

actually represents the only equipment damage that occurred during the 6/9 event. Here we had an actuator that cracked during cooldown. We found that the internal valve components became disengaged, and because of pressure forces the loose disc then was able to have a hammer blow up to the stem and then caused the damage to the actuator. We are repairing the damaged valve and also have disassembled and refurbished the other five sister valves. We're also going to take a look at the drainage and make sure that that's proper for the system.

[Slide.]

The last one I have to talk about is the Safety Parameter Display System, SPDS. Both these SPDS display devices were inoperative during the event. One had failed I believe the night before, and of course they are to be used by the operators during a transient.

We found here that we had a bad fiber optic cable and also had faulty terminations. Here again, it's a very sophisticated termination with a fiber optic. We found that they had done that improperly and we have used a spare cable and corrected the terminations and have restored it to good working order.

MR. WILLIAMS: Mr. Chairman, all of those will be corrected and tested, all of these issues that Mr. Wood has addressed.

The system review and test program that I would like

now for Mr. Lingenfelter to address, is I think one that will answer the question that you had just asked about what do we intend to do about other systems and assure ourselves that we have the confidence that they, too, will operate.

CHAIRMAN PALLADINO: The whole pattern of activity involves a lot of things. At the moment I don't have a clear picture of what is going to be done before restart and what's going to be done after restart, and why can we do it that way.

MR. WILLIAMS: Well, it's a clear picture for these that we have just presented, all of those. They will be done prior to restart. And all the motor-operated valves in all the safety systems will be done. But then we have other things that we may need to do in these systems, and you're right, we don't know what those are yet because we haven't finished our review of those. And Mr. Ligenfelter will tell you where we are on that.

MR. WILLIAMSON: Mr. Chairman, possibly one if the confusing things here is that we are going way beyond the requirements. We're just going through the whole plant and the whole operation to be sure that we get it up to the excellence that we really want. But the essential things will be done before restart, but our program is ongoing.

COMMISSIONER ASSELSTINE: This first one might be a good example because I gather one of the concerns that came out of the June 9th event was using that long run of pipe

where you had a system configuration that they safety analyses said they were relying on but they hadn't been tested, and I think that is a good example, perhaps, of what are you going to do to make sure that, not only for that particular run of pipe but throughout the plant, you understand which configurations your safety analyses and our safety analyses have relied upon in now making sure that all of those are tested so that you know if you have to use those configurations, they will work, will function as anticipated.

MR. LINGENFELTER: And that is the purpose of our program.

COMMISSIONER ASSELSTINE: That will help us understand how you are going to address the more generic implications of what occurred.

MR. LINGENFELTER: The system review and test program addresses two major generic concerns raised by the June 9th event. Obviously, the first is the effect of inadequate maintenance in root cause determination of systems important to safe plant operation, and the second is the concern on incomplete functional testing of systems and components.

The objectives of the systems review and test program are represented on this slide.

[Slide.]

In summary, the program will review systems

important to safe plant operation to identify maintenance and operations problems and proposed corrective actions. Second, the program will review the existing test program to identify any additional testing requirements and to prepare and conduct a restart test program to assure that systems important to safe plant operation are functional prior to restart.

The scope of the program includes 31 systems.

[Slide.]

They are presented on the following two slides. These are the systems we feel are most important to safe plant operation, and not all of the systems we are reviewing are safety related. There are nonsafety related systems that we are looking at.

The systems are arranged in five groups, as shown on these two slides. The groups include primary systems and electrical systems, groups 1 and 2. Group 3 is instrumentation and control, group 4 are support systems, and group 5 are secondary plant systems.

[Slide.]

As the Admiral stated, we currently have over 50 people working on this project. We consider it to be one of our most important activities. And the new systems engineering group is heading up this effort.

We have the 50 people arranged in five groups corresponding to these system groupings on the previous

slide. The groups consist of Toledo Edison engineering personnel assigned as the lead responsibility for each of the system reviews, and they are supported by highly qualified industry representatives experienced in operations, maintenance, design and testing.

Each system review began with a problem identification phase. That phase consists of a review of selected documentation as shown on the slide and focused interviewing of station operations and maintenance personnel.

The problems they have identified are currently going through an evaluation and corrective action development phase. In this phase, the problems are sorted according to significance, and those which we must address prior to restart are being further evaluated to develop corrective actions which solve the root cause problem.

This process and the results generated by the groups are being monitored and appropriately modified by an independent system review group composed of high level industry and Toledo Edison personnel with a broad range of experience.

[Slide.]

The test program phase of this effort is being conducted by the same review groups. The groups will review the existing test program to assure that overall routine testing, including surveillance testing and periodic testing

and preventive maintenance testing, is adequate to assure that systems will perform specified functions.

The groups will then develop and improve the test program, including modified routine testing and some special one-time tests as required. The scope of this restart test program is also under review by the independent review group.

That is all I have.

COMMISSIONER ZECH: That has got to be coordinated too with your plant manager, all those tests as well as the maintenance program.

MR. WILLIAMS: Absolutely. Actually, we are going to bring in some test engineers. Our operators are good at -- you know, they are used to conducting surveillance tests and that type of thing, but we are going to bring in some test people that have used in startup tests elsewhere that have been more in tune with this kind of a test program, which is of greater magnitude than our operators have seen since startup.

COMMISSIONER ZECH: Very good.

[Slide.]

MR. WILLIAMS: We had to do some analysis work to determine whether or not certain components in the plant might have been damaged in the June 9th event and also to investigate the feed and bleed capability -- no, that's not right. I wanted to take this startup feed pump.

As you know, we had a new auxiliary feed pump planned to be installed in upkeep March of next year, and it was to referred to as the third pump. We accelerated that and pulled it back. That pump is on site, has been installed on its foundation, and most of the piping is in, the electrical wiring is in. It will be in and ready to operate well before the startup.

It is electrically driven. It gets its power from -- in an emergency, it will get its power from either diesel generator. It can be operated from the control room. That is the pump. It will be lined up when we start the plant up to the main feed system, and when we get up in power, we will shift it over to line it up to the auxiliary feed system.

In the auxiliary feedwater spaces, all of the piping and valves are -- it's a fully safety grade system. The pump itself is located in the turbine building. It has the same capacity or as great a capacity as either of the auxiliary feedwater pumps that are steam driven.

I do not intend to take that existing pump out. We are having to use its electrical supply for the new one, but we are studying to see what it is we can do to get that one hooked back up in the long term so that we will have 3-1/2 pumps, if you will.

CHAIRMAN PALLADINO. It was my understanding before you spoke that the system in which this auxiliary

feedwater pump, the electrical one, is in is not safety grade.

MR. WILLIAMS: The building is not safety grade.

CHAIRMAN PALLADINO: Is that the only --

MR. WILLIAMS: No, neither is the motor or the pump safety grade. All of the piping and all of the valves that are within the auxiliary --

CHAIRMAN PALLADINO: Nor the what?

MR. WILLIAMS: Nor the motor are safety grade.

CHAIRMAN PALLADINO: Well, why can we get away with that? Why not make them safety grade?

MR. WILLIAMS: Well, it was not considered as necessary to be a safety grade pump when it was originally decided to put it in next March, in that the two auxiliary feedwater pumps were safety grade and suffice for the emergency cooling.

CHAIRMAN PALLADINO: I guess my question is why do you feel it need not be a safety grade, or maybe that is for the Staff, as well. You say you felt it wasn't necessary to make it safety grade.

MR. WILLIAMS: Well, our studies showed that the ability for decay heat removal, that the steam-driven pumps did provide that capacity or that capability, and they had the small startup feed pump that was electrically driven. The desire was to increase our cooling capability, and so they

have put in a larger startup feed pump. That was not required to be a safety grade pump. It was not really required to be a safety grade system, but I have made the system safety grade with the spaces, the auxiliary machinery spaces.

The pump has to be located in the turbine building, and the turbine building is not seismic.

COMMISSIONER ASSELSTINE: Maybe if you could just highlight in what respects this new pump you are putting in, particularly as it is being configured, is not safety grade or would differ from a safety grade one. For example, one thing I understand is it is at least now going to be hooked up so that you can start from the control room and you don't have to run around --

MR. WILLIAMS: Oh, yes, you can start it from the control room. You don't have to run around to do that. It can be fed from either emergency diesel generator. The valves that we are putting in now are manual because I cannot get the safety grade remove control valves in short term. They are long term items. Our long-term fix on that is to put in the remotely operated valves as well.

That is really not a problem because we will manually align it to the main feed system, and after we start up the plant and get up to 30 percent power, we will go down and manually align it to the auxiliary feed system where the valves open. So that's not a problem. And all of that is

safety grade, so the operators will no longer have to run down there to do anything.

COMMISSIONER ASSELSTINE: So is it mostly the nonseismic qualifications, just the space in which it's located?

MR. WILLIAMS: That's right. Not seismic qualified.

COMMISSIONER ASSELSTINE: The turbine building is not seismically qualified.

MR. WILLIAMS: That's the extent to which it is not safety grade.

CHAIRMAN PALLADINO: Did you say the motors in the pump itself were not seismic?

MR. WILLIAMS: Oh, yes, that is seismic. I'm right on that, am I not, Ted?

MR. MYERS: That's correct.

MR. WILLIAMS: The only thing that's not safety grade about it is it's not seismically qualified.

COMMISSIONER ASSELSTINE: That is because that is the spot you had where you could put it in.

MR. MYERS: Yes. Well, no, it probably goes a little bit further than that because if you were going to establish the seismic, there are certain quality assurance, quality control aspects in the manufacturing of the pump that you would address to make sure were done, and then the building is not that way.

COMMISSIONER ASSELSTINE: So it is both the equipment and the building.

MR. WILLIAMS: Yes. Not that it's not an extremely reliable pump and motor; it's just that those aspects of QA were not applied during the manufacturing process.

CHAIRMAN PALLADINO: Okay. When -- and maybe not today -- but when we talk to the Staff, I would like to get their assessment of the situation.

I notice it's 12:00 o'clock, and we're about halfway through.

MR. WILLIAMS: Well, the analysis program and the decay heat removal are the essential ones. I think the last two, we can drop off without any loss on your part, really, sir.

CHAIRMAN PALLADINO: All right. What do you propose to do?

MR. WILLIAMS: Run rapidly through those two.

Mr. Myers, run rapidly.

[Slide.]

MR. MYERS: The analysis program, post-June 9th, had four major objectives. First of all, of course, was to evaluate the effects of the transient on selected plant equipment; secondly, to develop and benchmark an accident transient model that could be used, specifically representing Davis-Besse; thirdly, was to evaluate feed and bleed or the

makeup HPI cooling at Davis-Besse; and then finally, support any procedural or equipment improvements recommended for the rest of the program through an analysis evaluation.

[Slide.]

The current status, the steam generator and auxiliary feedwater systems, the stress and heatup condition evaluations are complete and satisfactory. No significant effects.

The reactor coolant system is also undergoing a review, and preliminary results indicate there will be no significant problems stemming from the June 9th even there, either.

The transient model that was developed is a RELAP-5/Mod 2 model and has been successfully benchmarked against the OTIS test facility. That is a joint NRC/EPRI/B&W Owners Group B&W facility built in Alliance.

Our June 9th evaluation was made with that transient model, looking at the case where we would have run a similar transient and have not restored feedwater, relying totally on Davis-Besse feed and bleed. That indicated successful core cooling throughout that event.

Additionally, 100 percent cases, full-power cases were run for Davis-Besse. I will summarize them in a moment.

COMMISSIONER ASSELSTINE: Is that dependent upon when you turn on the makeup pump?

MR. MYERS: Yes, it does.

COMMISSIONER ASSELSTINE: So when you say it verified it, that was under the assumption that you turned -- well, you had one running, as I recall.

MR. MYERS: Yes. In the June 9th event, the simulation we ran lost all feedwater, as we did in that event, and precluded operator action until 30 minutes after the event. We will go through the other simulations here in just a minute.

[Slide.]

Just as a reminder, in this diagram we talk about feed and bleed operation at Davis-Besse. The bleed portion is provided through the reactor coolant system. The hot leg high point vents, the pressurizer vent, the pilot-operated relief valve, and of course the code safeties are available.

The injection portion is provided by the Davis-Besse makeup system at pressures higher than what our high-pressure injection system would provide.

Similarly to our discussion before --

CHAIRMAN PALLADINO: I'm sorry. You say you have pumps that can inject --

COMMISSIONER ASSELSTINE: It's the piggyback mode, right?

CHAIRMAN PALLADINO: But only in a piggyback mode?

MR. WILLIAMS: Well, they can inject at full system

pressure. They come around at 1850 pounds with the piggyback mode, even piggyback. But these analyses were run under those conditions.

CHAIRMAN PALLADINO: You are not going to correct that?

MR. WILLIAMS: We are looking -- I will speak to that later when Mr. Jain gets here. There is a long-term correction on installation of high-pressure makeup feedpump, but we don't --

CHAIRMAN PALLADINO: I was sort of surprised to find that situation existing in a plant, that you would have an injection system that can't inject. I would expect to see that given prompt attention.

MR. WILLIAMS: It is given as prompt attention as it can be given, Mr. Chairman, but there are two ways you can lick that problem. One is to blow the pressure down quickly on the plant, so that your existing HPI system can take care of it, and that is the case of using the PORV and the hot point vents, and our system can be reduced in pressure down to the point where our systems can handle it.

CHAIRMAN PALLADINO: Is this the only plant that has this kind of situation?

MR. WILLIAMS: I will have to defer to the Staff on that, sir.

CHAIRMAN PALLADINO: Yes. I was looking at the

Staff.

MR. DENTON: Let me answer that this way, Mr. Chairman.

Westinghouse plants, many Westinghouse plants, do not have the capability to pump water at high enough head to open the safety relief valves, and they rely on PORVs to blow the plant down. This plant has sort of the Westinghouse level of HPCI, but they don't have all the relief capacity that some of the Westinghouse plants have, and that is one of the things we are looking at.

CHAIRMAN PALLADINO: But I thought this one couldn't pump at the operating pressure. I think the Westinghouse ones can at least pump at the operating pressure.

MR. DENTON: There are very few plants, only a handful, that can actually pump water right through and against the relief valve setting.

CHAIRMAN PALLADINO: I wasn't thinking about pumping against the relief valve setting, but pumping so that you can get water in when the system is still at pressure, and I am thinking of the LOCAs or small LOCAs.

MR. DENTON: I should get Brian Sherwood to get up and talk about this just a little bit.

If you remember, these systems were designed to comply with the emergency core cooling requirements of the Commission, which is to cope with pipe break sorts of things,

and a variety of designs resulted, some of which are able to pump right through the relief valve.

Some plants -- you will recall that we have talked about Combustion Engineering plants -- don't have a PORV, and therefore you have a difficulty in that case, and they rely on other ways to get the pressure down.

But here, what we are looking at is the total capability of the pressure to cope with loss of feedwater, and that means looking at the size of the PORV, the makeup pumps, the HPCI, and other means.

If you would like to hear more on this subject --

CHAIRMAN PALLADINO: Well, maybe not at this time.

MR. DENTON: TMI-1 is somewhat of a unique B&W design, in that it does have very high pressure to HPCI pumps, which can't pump water against the relief valve pressure.

MR. WILLIAMS: The point I'd like to make here is, since this event has happened, there was a question about whether or not Davis-Besse could feed and bleed under these conditions. We had B&W burning the midnight oil to make the analysis that is specific to our plant, and it didn't turn out that, yes, we could keep the core covered with operator action being deferred as long as 30 minutes.

We had some problems with some other issues. How do you determine -- you know, at what point did he really take action? And this is what gets into the next part of the

analysis.

As you will see, we concluded that it's better for our instrumentation and the quality of our instrumentation to have him take action on hot leg temperature. And we went into the analysis on the assumption that we would take that action and get 610 degrees hot leg. That took, in our estimate at the time we went into the studies, three minutes to three and a half minutes for it to reach that point. So the graphs you see are going to be peculiar in that they will say 8.5 minutes, 13.5 minutes, and so forth for operator action time, but that's really because it took three and a half minutes for the temperature to get there, and it actually it takes longer than that.

MR. MYERS: The injection portion provided at Davis-Besse comes from what we call the makeup system. There are two centrifugal pumps, 12-stage, 450-horsepower motors, that are provided on a normal -- one is normally operating at all times for injecting against system pressure.

In the injection feed and bleed mode of operation, the operator is instructed to start the second pump, to open the high point vents, to open the pressurizer vent, and open the pilot-operated relief valve. This initiates feed and bleed cooling at Davis Besse.

What we tried to depict in this slide is, although the makeup system was not originally identified as a

safety-related system in its original licensing, there are many attributes, very similar to the other discussion, that are provided and supported as a safety-related system.

MR. WILLIAMS: Essentially, all of this is not safety grade, really. It is the ventilation to the room in which the pump and motor are located.

MR. MYERS: And an evaluation of hazards which would normally accommodate any safety-related system. Also, redundancy is not part of it.

So for Davis-Besse, the injection mode is provided by the makeup system and has full capability against full system pressure and right against the code safeties to inject water.

[Slide.]

The next slide looks at the actual, 100-percent full-power cases that were evaluated for feed and bleed operation with our benchmark model that was developed after June 9th.

There is some conservatism built in to these evaluations. As I identified before, makeup flow is normally flowing at all times. In this case, we ignored that flow and provided actuation at the operator action times identified below, and also we took no credit for the post-TMI anticipatory reactor trip system installed, which would trip and eliminate the full-power conditions about eleven or twelve

seconds earlier than identified here.

Four cases were run, again looking for a new and better operator initiation parameter. It was identified that we would use hot leg temperature alone as an indicator for the operators to initiate feed and bleed cooling.

Preliminary analysis indicated that by selecting a hot leg temperature, we would end up with approximately three and a half minutes before the system got to that condition, and therefore we ran cases with five and ten-minute delays on that, giving us an eight and a half and thirteen and a half minute case, and then twenty and thirty minutes cases to initiate feed and bleed.

The results are summarized in the next slide.

[Slide.]

As identified in the first three cases, there is ample core cooling in each of those cases, and the information that was provided to the Operations Group and the evaluation and coming up with a new parameter to initiate feed and bleed is coming out to be a hot leg temperature of 600 degrees.

COMMISSIONER ASSELSTINE: Is the line at 12 covering the core?

MR. MYERS: Yes, that's correct. I'm sorry. The 12-foot is the top of the core.

COMMISSIONER ASSELSTINE: But I take it, what you have done is to look at your procedures in terms of saying,

"We are going to pick a point in terms of hot leg temperature." That is when all the makeup pumps go on, and you open the high point vent, you open the PORV and start draining water out of the system, and that is three and a half minutes?

MR. WILLIAMS: Well, actually we may change that a little bit. It was 610 in this analysis, but it may come out that we use 600 or 602 degrees, being that we haven't really decided on that parameter as of yet; am I not right?

MR. MYERS: It looks like it will be more like 600.

COMMISSIONER ASSELSTINE: So that will prompt operator action.

MR. MYERS: That's a very conservative case. We expect there will be much more time available based on the conservatisms in the analysis.

MR. WILLIAMS: Mr. Chairman, in addition, when we looked and we said, "Well, there's all that much question about the feed and bleed in the pumps, I put another group together of very competent people, I think, under Mr. Sushil Jain's leadership, to determine what could be done near-term and long-term to better equip us, that made any sense to do, to remove the decay heat.

And this is Mr. Sushil Jain.

MR. JAIN: Thanks, Admiral.

Honorable Chairman and Commissioners, most of the

systems that were critical to the June 9th event related to removal of decay heat from the reactor core, namely the main feedwater system, the main steam system, the oscillating feedwater system, the startup feedpump, the steam and feed rupture control system, or the SFRCS, and the feed and bleed mechanism, which is the cooling mode for the primary-site.

The task force identified changes to improve the reliability of these systems, as well as the complexity of the SFRCS, and the task force utilized lots of senior-level, experienced people in design, operations, and engineering, both from Toledo Edison as well as people from MPR, Cygna, and B&W.

The objectives of the task force were to reduce the frequency of demands for the auxiliary feedwater system and the emergency means of decay heat removal, and reduce the number of automatic responses that initiate auxiliary feedwater and to reduce the potential for common mode failure, similar to the one experienced on June 9th, and finally to evaluate other redundant means to remove decay heat from the core.

The overall goal that we were shooting for was to improve the liability specifically of the auxiliary feedwater system for it to be commensurate with the NRC's specified Standard Review Plan criteria.

[Slide.]

The methodology exercised by the task force used deterministic approaches, as well as scoping calculations where necessary, and engineering judgment, as well as reliability analyses were utilized to assess the relative benefits of different changes that were recommended.

In the process of doing all this, applicable documentation, as well as past operating experience, including the June 9th operating experience, was totally reviewed by the task force, and in the process also, Toledo Edison people appropriately were interviewed.

[Slide.]

There are three things that can be done to improve the reliability of any system. The very first thing you do is to minimize challenges to it. So if you minimize challenges to it, the fewer times it fails.

The second thing you do is, once you challenge it, you make sure it starts.

And finally, what you do is, once it starts, you want to make sure that it does accomplish its mission.

So the very first part is to reduce the spurious initiators for the decay heat removal systems. In that regard, the steam generator level signals that feed the SFRCS, the steam and feedwater rupture control system, which initiates the auxiliary feedwater system, will be filtered to screen out all the spurious signals going into the level

strengths of the SFRCS.

Also, the power supplies that are utilized by the SFRCS, their performance will be improved by providing better support systems for the power supplies.

And finally, the main steam and main feedwater isolation on low level of the SFRCS initiation will be modified to ensure that the primary means of heat removal, which is the main feedwater system, supported by the main steam system, is always available.

[Slide.]

COMMISSIONER ASSELSTINE: What has the history been in terms of having spurious initiators of aux feed where it really wasn't called for?

MR. JAIN: There have been several initiations in the past, and a brief review reveals that about, say, 40 to 50 percent could have been caused by -- I wouldn't call it spurious, but undesired actuation, not necessarily caused by instrumentation problems, but because of plant conditions at the time.

To improve the performance of the auxiliary feedwater system, based on the analyses conducted in the past, the most dominant contributors that were found for the auxiliary feedwater system were the motor-operated valves and the performance of the turbine and the governor.

As mentioned earlier, Toledo Edison has embarked on

a program to improve the motor-operated valve in general, and further modifications are underway to reduce the number of valves in the auxiliary feedwater flowpath that have to either position or reposition, basically to minimize their failure.

In that light, the discharge valve from the condensate storage tank, which supplies the suction water to the auxiliary feedpumps, will be depowered to minimize spurious actuation or spurious mispositioning of that valve.

Also, to minimize overspeed tripping and minimize the condensation in the long steam lines, the steam admission valves will be provided in close proximity to the auxiliary feedpump turbine.

Further, to enhance human engineering for the control room operators, the SFRCS actuation panels will be revised, which I will get to in a little bit.

MR. WILLIAMS: I think I will break in right here and say that the valve flowpath reductions is one that you brought up, I think, Mr. Chairman, at an earlier meeting, and you know, the isolation of those steam generators, the discharge valves and the auxiliary feed, that is directed at, can we leave those valves open?

Our analysis, which was completed last night, shows, yes, you can leave one of them open on the last steam generator that is depressurized, and so if you have a break on the other side, this one's going down, this one is following,

that valve will stay open. Your other isolation will take place, and then you've got a source for cooling and no valve to open.

We are continuing the analysis to determine whether to leave both of them open, but that analysis will take longer to do, and it will be done before startup. But we don't have that yet.

MR. JAIN: To ensure that the auxiliary feedwater system does continue to run once called upon to actuate, the governor on the No. 1 turbine will be replaced by a better-designed PGG governor, which has already been installed on the No. 2 pump turbine in the last refueling outage.

For a better awareness of the operator, the control room annunciator window will be modified to make him better aware of the SFRCS status. The next three modifications basically relate to improving the performance of the oscillating feedwater system on the suction side, and then a local position indication for the trip throttle valve will be provided, in case the operator has to manually locally control the turbine.

[Slide.]

The next slide shows the manual actuation buttons for the SFRCS, which kind of played a key role during the June 9th event.

MR. WILLIAMS: He not only pushed the wrong buttons;

he pushed the two top ones that had to do with the pressure, low pressure.

[Slide.]

MR. JAIN: The next slide shows the revised configuration of the manual initiation buttons, where the buttons most frequently used have been located on the top, and those are the ones that will be used the most by the operator as directed by the procedure. The others on the bottom are the less frequently used buttons, and they will be provided with a plastic cover. I have samples here of the buttons.

And in order to make those switches less error-prone, plastic covers will be provided on those, so the operator has to think twice before depressing those switches.

MR. WILLIAMS: Each one of those will be covered with one of these (indicating).

COMMISSIONER ZECH: I'm sure that's a good idea. But still, training is very important in all of this, so they really don't just go to the top button for some kind of casual reason, when it could be that the need to push the other buttons.

MR. WILLIAMS: I'm going to skip the operator part of this, because time is running out. But one of the things in the operator area is not only the training, but we're changing our procedure, so that when the reactor operator takes preliminary action in a case of this kind, he must

notify the SRO that he is doing so. He doesn't have to ask his permission, but this gives a chance for the SRO to have a vote.

Sushil, I'm going to cut you off here.

[Slide.]

The longer-term decay heat removal, they are really long-term, and we are looking at them -- I don't know what that is going to show. Certainly, the control room mimic panel for the finalized AFW/SFRCS will be designed and installed to enhance the capability of the operators to recognize and handle these situations better.

But there are two other areas I've asked Mr. Jain to go back -- they gave me the report on the recommendation for short-term/long-term improvements, and we're going back to take a look at our ability to insta'l additional PORV valves, two of them, under the present code safety valves on the pressurizer. That will give us the capability to rapidly blow the plant down, and further more, take a look at one that he looked at previously, take another look at it -- the installation of one high-capacity injection pump, HPI pump, that can pump at system pressure.

Now, you know, we were talking about, that is a longer-term thing, but it would give us a far better capability to do that, and that's going to take a little bit of time to generate that study, and then if we decide to do

it, it's decided that it's needed, it's going to take awhile to get that kind of hardware built.

But we do have the room on top of the pressurizer to do that. And let me assure you, we've done the -- on the operator's side, we're going to do the training and change of procedures to reflect what was learned in the June 9th event, and also in the training area, as you may know, we have a site-specific simulator on order, or the contract will be let here right after the first of the year, and that will be available -- when is that going to be available? -- '88. It will be placed in the Administration Building there. We will move a lot of the training up there.

The present training facilities are really superb in terms of space, and the laboratories that are going in are good. The Training Department has been built up markedly in terms of personnel. The qualification of the personnel has been upgraded. We have made it financially attractive for station people to rotate out of the station and over there as a career path, so that we have knowledgeable people. That is all to be put in place, but that capability exists.

And with that, Mr. Chairman, I will conclude our presentation. I know you need to get going.

CHAIRMAN PALLADINO: Thank you very much.

MR. WILLIAMSON: Pardon me, Mr. Chairman. You might introduce Bill O'Connor, who is our Assistant Superintendent.

MR. WILLIAMS: I cut him off. This is Mr. Bill O'Connor, Assistant Plant Manager of Operations. He did a marvelous -- he did the job over the telephone on June 9th and kept saying, "You do this, you do that, you do this."

CHAIRMAN PALLADINO: Well, we commend him for his very fine work.

Well, let me say, we have covered a lot of ground, or you covered a lot of ground. I hope that we all stay with you. But I must say, I commend you for the initiatives you have shown and the reorganization and new people that you have brought aboard and are bringing aboard. Your attention to these problems, I think, is an essential part of making sure that this plant operates safely.

Of course, we have not heard from the Staff as a result of this presentation, but I am sure that on the points that I am speaking to, they certainly would be heartened by the initiatives you have taken.

Before seeing if the Commissioners have any other closing questions, I would like to see, if possible, at agenda planning, having a meeting before we have the hearing with Congressman Markey on the 2nd.

Now I was considering even a possibility of tomorrow, and I would like Staff to look at their schedule and for us to look at our schedule, so when we come to agenda planning, we can look at it. I notice that we do have a

meeting scheduled from 9:00 to 10:30, and I think we had it at that time because we had something else that now fell by the wayside, and I want to look to see if at least we can get an hour or so with the Staff, not only on Davis-Besse, but on some of the generic issues and the related plants that I'm sure will be a subject at the hearing.

Now let me see if the Staff has any particular comments on the presentation this morning that they would like to make, on the order of one or two minutes.

[Laughter.]

Go ahead.

MR. DENTON: There is a substantial upgrading in all the major safety areas going on at this plant, and we are encouraged by that. We just received in the past few days an answer to my letter of a few days ago, and that is being looked at. We are having assessments of their upgraded maintenance plans done, their training plans. I have requested an ACRS subcommittee meeting on thermohydraulics to look at the feed and bleed and the auxiliary feedwater systems. In fact, I have asked the ACRS to meet with us on the entire plant upgrade before reaching any decision on a restart.

So we are doing a lot of studies and inspection. But I am finding that this is a case where the utility is showing the initiative. They are taking the lead in these,

and our principal role at the moment is being sure that they have gone far enough, the sort of question you've asked.

CHAIRMAN PALLADINO: All right, thank you.

Let me ask the Commissioners if they have any burning questions they would like to ask?

COMMISSIONER ROBERTS: I have a very quick one, and I don't mean to ask something that is none of my business.

Have you got a timetable on when you are going to complete this ambitious undertaking?

MR. WILLIAMS: Yes, sir. I want to commence the startup evolution the first week of November, and that's where we are headed, and the resources are being applied to it.

CHAIRMAN PALLADINO: I understand something was given to SECY on scheduling, and I was handed a copy by my assistant sometime during the meeting.

MR. WILLIAMS: It's not in the presentation. It was separate, I believe.

CHAIRMAN PALLADINO: Yes. It was handed to me separately. So we might make sure that everybody has it.

COMMISSIONER BERNTHAL: Let me just make a comment. I guess one of the things, Admiral, that I learned back when I was still on the Hill was that people in universities are not necessarily the best at t[illegible]g and briefings, and I was always impressed with the ability of the services to give a concise and informative briefing without wasting time, and you

certainly have done that here today.

I am sorry I missed the early part of it. I have a feeling, though, that it reflects your experience from earlier days.

We have learned here, to our chagrin, that being too complimentary seems to be the kiss of death. So I'm not going to compliment you much.

[Laughter.]

MR. WILLIAMS: Thank you.

COMMISSIONER BERNTHAL: I think everyone here knows of one or two cases recently like that, so I will save my compliments.

I will say that the people of Ohio, I think, once before were denied the opportunity to benefit from your expertise and capabilities and probably should have had that opportunity, and I am looking forward to seeing your capabilities and those of a responsible and apparently good team applied in the months and years ahead.

MR. WILLIAMS: Thank you, Commissioner.

COMMISSIONER ASSELSTINE: I would just add, I agree very much with what Commissioner Bernthal said. I thought this was an excellent presentation. You covered a lot of ground that provided us with a lot of information to chew on. And without having had the opportunity to chew on that a little bit more and talk to the Staff about it, I would say

that I am very impressed with the amount of work that you have been able to do thus far, particularly since I was out there. It looks like you have covered an awful lot of ground and made some real progress.

MR. WILLIAMS: It's really hitting Mr. Williamson in his pocketbook, I'll tell you that.

[Laughter.]

CHAIRMAN PALLADINO: Any further comments?

[No response.]

CHAIRMAN PALLADINO: Well, thank you very much, gentlemen. We appreciate your coming here today, and we did get a very good presentation.

We stand adjourned.

[Whereupon, at 12:30 o'clock, p.m., the Commission meeting was concluded.]

CERTIFICATE OF OFFICIAL REPORTER

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of: COMMISSION MEETING

Name of Proceeding: Continuation of 7/24 Briefing on Davis-Besse

Docket No.:

Place: Washington, D. C.

Date: Tuesday, September 17, 1985

were held as herein appears and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission.

(Signature) Suzanne B. Young

(Typed Name of Reporter) Suzanne B. Young

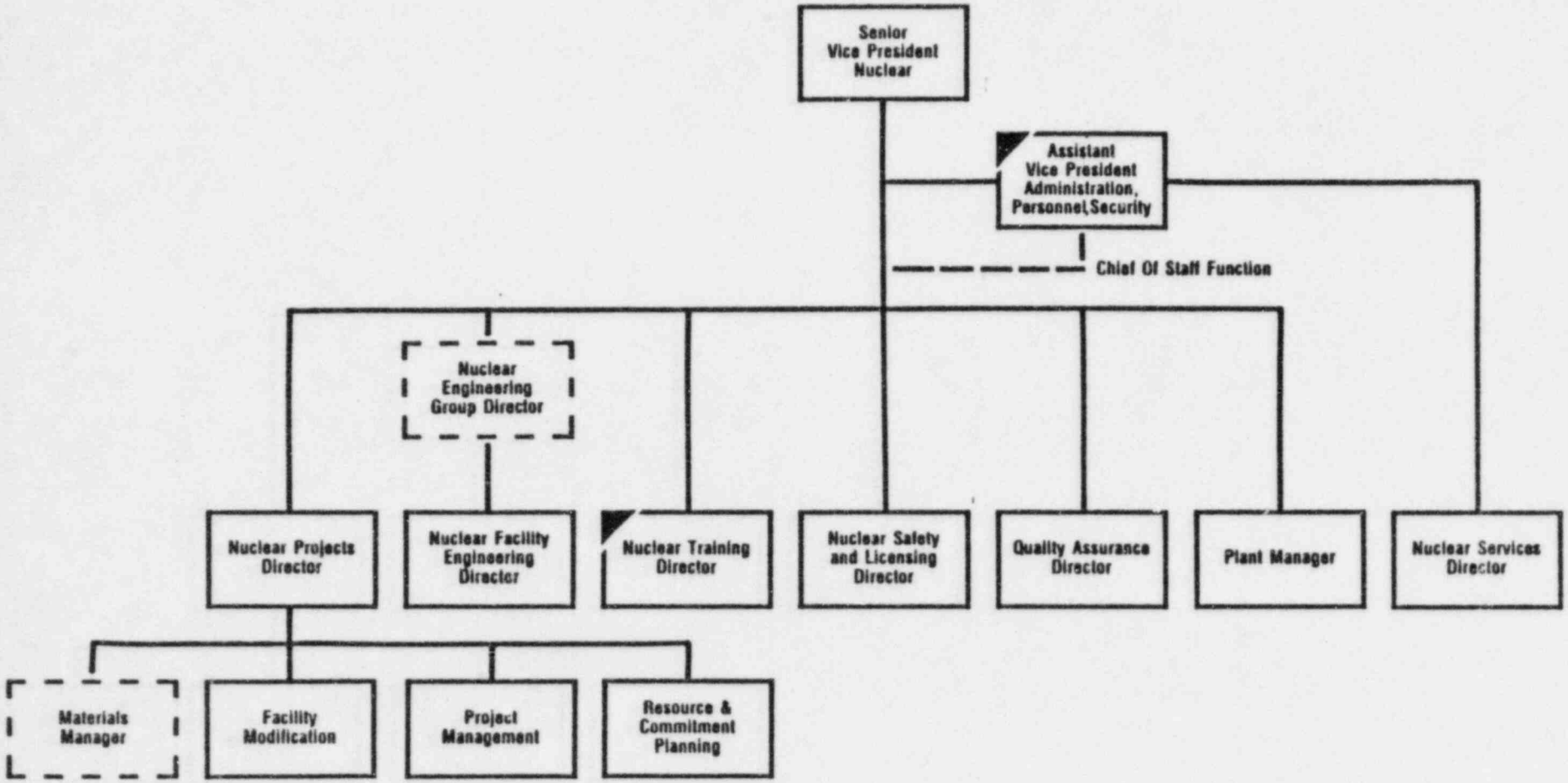
Ann Riley & Associates, Ltd.

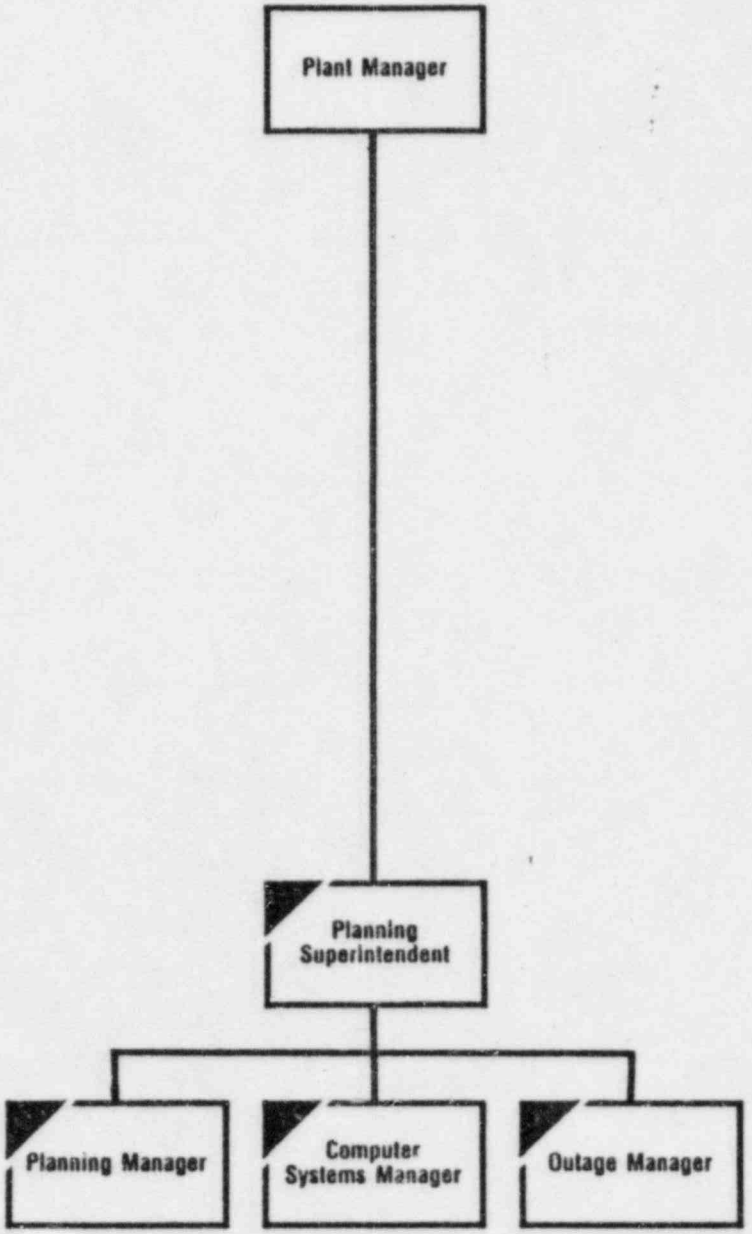
Toledo Edison Presentation to NRC Commissioners

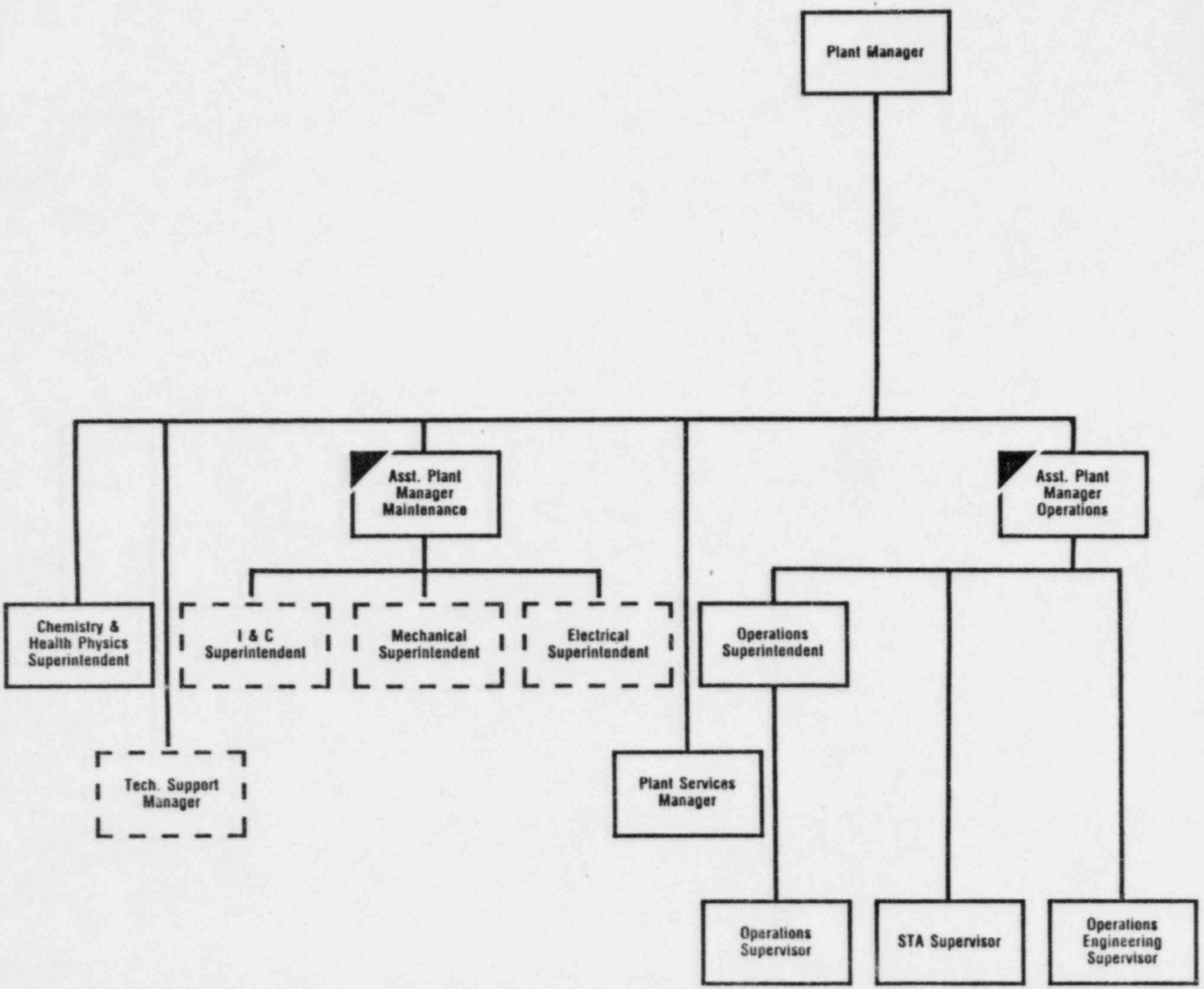
September 17, 1985

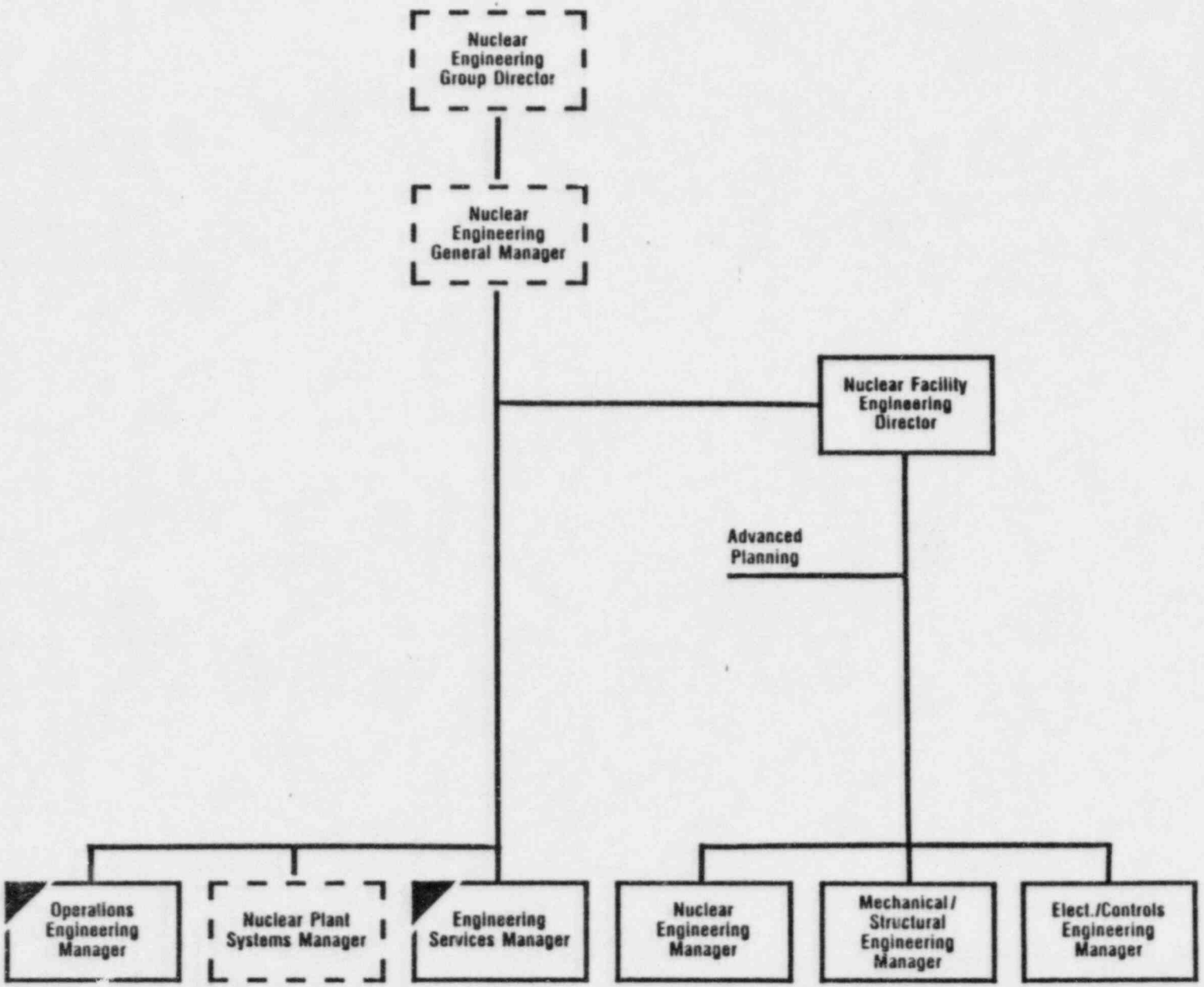
John P. Williamson *Chairman*	**Introduction**
Joe Williams, Jr. *Senior Vice President Nuclear*	**Mission Management Changes**
Steve Smith *Assistant Plant Manager, Maintenance*	**Status of Course of Action (Maintenance Improvements)**
John Wood *Mechanical/Structural Engineering Manager*	**Event Investigation (Equipment Investigation)**
Jacque Lingenfelter *Operations Engineering Manager*	**Safety System & Testing Review Program**
Joe Williams, Jr.	**Motor Driven Feed Pump**
Ted Myers *Nuclear Safety & Licensing Director*	**Analysis Results**
Sushil Jain *Senior Nuclear Engineer*	**Decay Heat Removal**
Bill O'Connor *Assistant Plant Manager Operations*	**Operational and Procedural Changes**
Mel Stewart *Training Director*	**Training**
Joe Williams, Jr.	**Closing Remarks**

Nuclear Mission Organization




Plant Manager
Planning Superintendent
Planning Manager
Computer Systems Manager
Outage Manager


Plant Manager
Asst. Plant Manager Maintenance
Asst. Plant Manager Operations
Chemistry & Health Physics Superintendent
I & C Superintendent
Mechanical Superintendent
Electrical Superintendent
Operations Superintendent
Tech. Support Manager
Plant Services Manager
Operations Supervisor
STA Supervisor
Operations Engineering Supervisor


Nuclear Engineering Group Director
Nuclear Engineering General Manager
Nuclear Facility Engineering Director
Advanced Planning
Operations Engineering Manager
Nuclear Plant Systems Manager
Engineering Services Manager
Nuclear Engineering Manager
Mechanical / Structural Engineering Manager
Elect./Controls Engineering Manager

Summary of Major Changes Within The Nuclear Mission

- A new organizational structure for the Nuclear Mission nas been approved. Staffing increases from 690 to approximately 930.
- Salary adjustments will be made to make TED truly competitive in recruiting talent and maintaining stability.
- The Asst. Vice President, Nuclear has been assigned to concentrate his attention on Security, Personnel, and Administration activities. All of these functions are provided by Toledo Edison organizations outside the Nuclear Mission.

Summary of Major Changes Within The Nuclear Mission

- Position Descriptions are being written.
- All Nuclear Mission personnel are being moved to the site as well as materials support personnel.
- Training Director now reports directly to the Senior Vice President, Nuclear.

Summary of Major Changes Within The Nuclear Mission

- A new Plant Manager is in place.
- The position of Assistant Plant Manager, Operations has been established and filled.
- The position of Assistant Plant Manager, Maintenance has been established and an experienced maintenance manager has been hired for that position.
- The Maintenance Department has been reorganized, enlarged, and experienced personnel have been hired for the key positions.
- The position of Materials Manager has been established. An experienced manager has been hired.

Summary of Major Changes Within The Nuclear Mission

- A new centralized Planning Department, reporting to the Plant Manager, has been established and an experienced manager has been hired as Superintendent.
- The previous Plant Manager has assumed the duties as head of the expanding Engineering Division.
- The Nuclear Engineering Division has been substantially enlarged and is being staffed.

Reassignment of PEP and SALP Improvement Program Activities

High Priority—Will Receive Commensurate Emphasis and Resources:

- Prepare Detailed Position Descriptions for New Organization
- Merit Review and Salary Administration Program
- Configuration Management
- Management Training
- Management By Objectives
- Fire Protection
- Nuclear Mission Procedures
- QA Awareness Program
- Non-outage Work Prioritization
- STA Assume Interim EDO Function

Configuration Management

- Component/System data base
- System descriptions/design basis
- Validated vendor manuals
- Control of drawings and manuals
- Accurate spare parts allowance

Maintenance Improvement Program

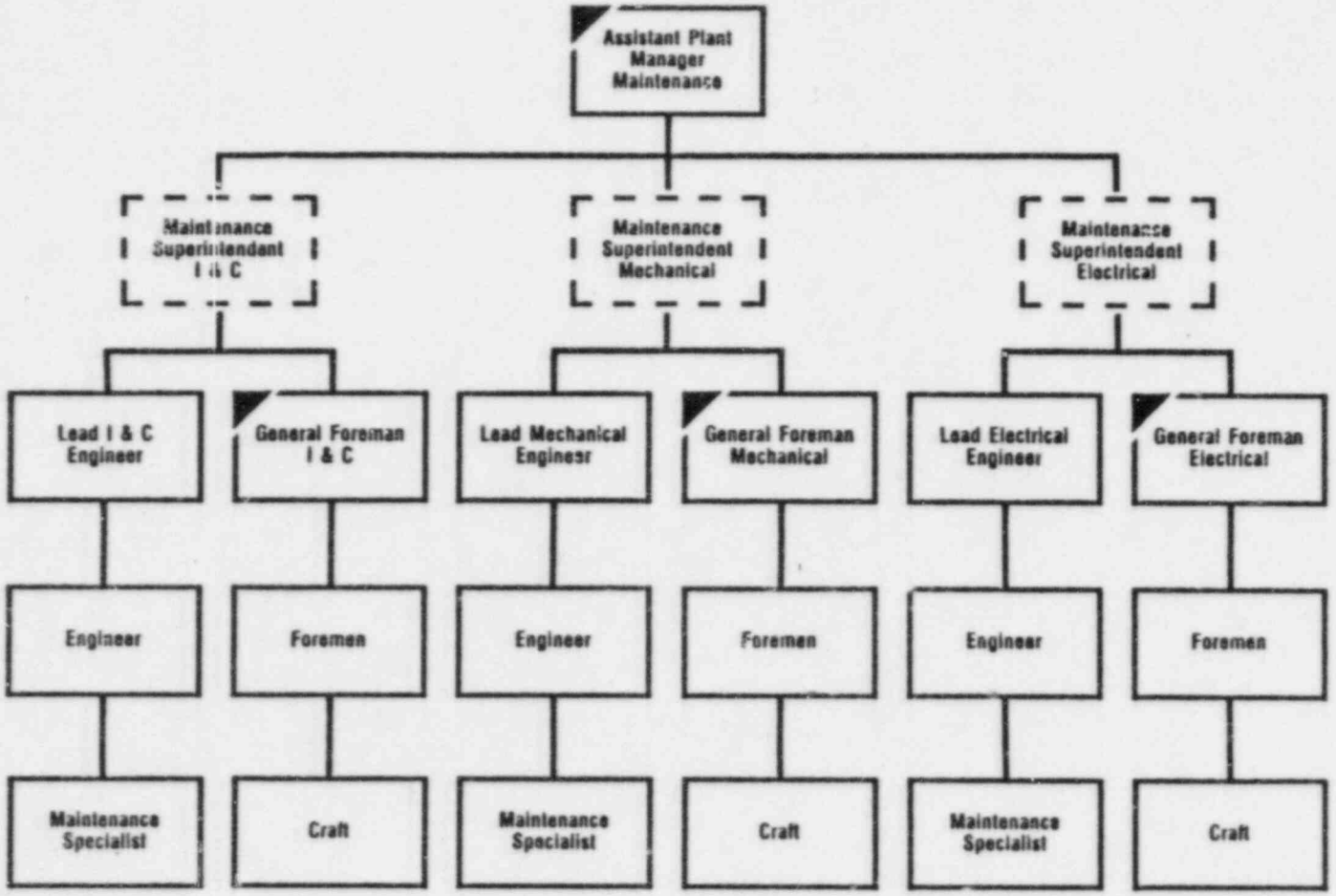
Changes are being implemented in several broad areas:

- Organization and Staffing
- Training
- Administrative and Technical Procedures
- Preventive Maintenance
- Spare Parts and Material Control
- Engineering Interface and Support
- Plant Cleanliness and Material Readiness
- Facilities

Overall Procedure "Conduct of Maintenance Activities" in preparation:

- Will formalize management policies, duties and responsibilities.
- Will provide guidance regarding goals and objectives.
- To be completed by October 15.

Plant Maintenance



Organization

New Management Personnel

- Assistant Plant Manager, Maintenance
- I & C Superintendent
- Mechanical Maintenance General Foreman

Increased supervisory personnel for each discipline:

- Superintendent
- General Foreman
- Lead Engineer
- Foreman

Improved supervisor/craftsman ratios:

- Mechanical, 1/10 (was 1/23)
- Electrical, 1/6 (was 1/26)
- I & C, 1/7 (was 1/19)

Improved department communications:

- Assistant Plant Manager meets daily with Superintendents and General Foremen.
- Weekly with Foremen and Shop Stewards.
- Monthly meetings with each discipline.
- Quarterly department meetings.

Training

- One Foreman in each discipline has been designated "Training Foreman".
- "Training Shift" concept being adopted
  - Assures periods devoted to training.
- Training Councils formed in each discipline.
  - Craft personnel (1 member for each 10 craftsmen)
  - Makes recommendations to Assistant Plant Manager, Maintenance and Training Director.
  - Considers types of courses, course quality, schedule.
- Where appropriate, outside organizations or facilities will be utilized to provide training.
- Currently utilizing Commonwealth Edison training facilities to support certain training needs.

Administrative and Technical Procedures

- Upgrade program commencing 9/85, to be completed 12/86
  - Incorporate NRC, INPO and industry guidance in administrative procedures.
  - Incorporate plant experience in technical procedures.
  - Establish well-defined administrative and work controls.
  - Assure formal feedback mechanisms.
  - Involves approximately 100 administrative and 1500 technical procedures.
- Outside assistance with expertise in procedure preparation.
- Technical positions in each discipline responsible for technical procedure content and quality.
- Walk-throughs for new and revised procedures.
- Vendor technical manuals will be reviewed by each discipline until configuration management program is in place.

Preventive Maintenance

- Will be addressed by system engineering group.
- Outside assistance involved:
  - Babcock and Wilcox
  - Bechtel
- PM's to be scheduled by new central planning group.
  - Establishes priority.
  - Assures coordination with backlog reduction.

Spare Parts and Material Control

- Program developed and in implementation.
- Spare parts adequacy and inventory control are priority issues.
- Objective is assurance of improved material resources.
- Part of configuration management program.

Engineering Interface and Support

- Formal identification of concerns to appropriate levels of engineering and management.
- Concerns listed in integrated plant schedule with response dates.
- Responsibility to resolve concern and to implement assigned to specific individuals.
- Procedure incorporating these features to be implemented by 9/30.
- Goal is improving turnaround time for engineering problem resolution.

Plant Cleanliness and Material Readiness

Continuing program now in place.

Composite (cross-discipline) crew devoted to plant walkdown.

- Reports to Assistant Plant Manager, Maintenance.
- Repairs minor problems as found.
- Initiates maintenance action items and work requests.
- Establishes schedules and priorities for dedicated cleaning crew.

Each member of Maintenance Department staff (38 people) responsible for daily inspection of assigned area.

- Permanent assignment of area responsibilities.
- Guidance provided.
- Deficiencies result in work requests or cleaning crew punchlist items.

New Maintenance Facilities

Five-story structure being constructed:

- Adds 100,000 sq. ft. of shop and office space.
- Preliminary work currently in progress.
- Groundbreaking - September, 1985.
- Scheduled for occupancy-November, 1986.

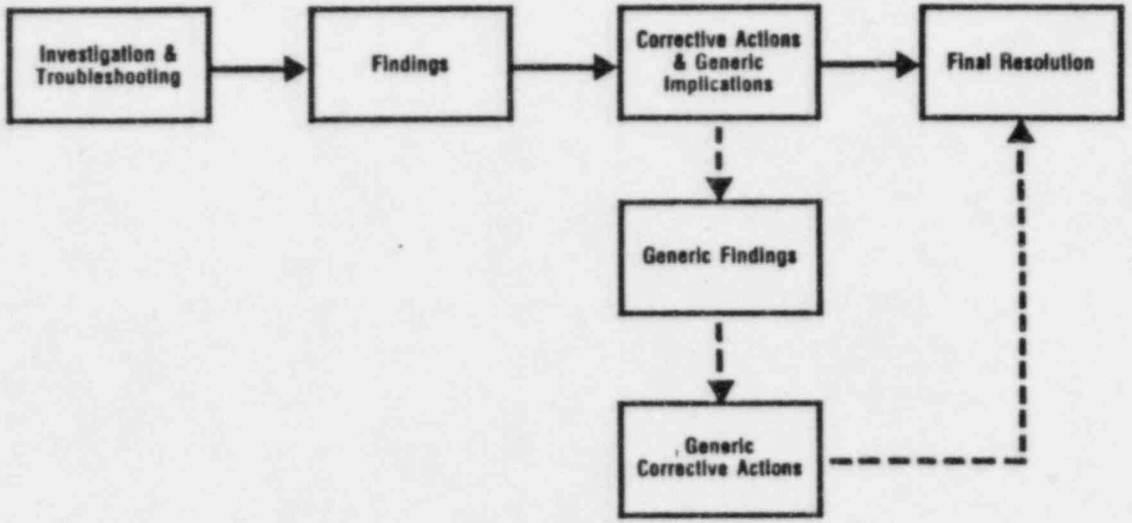
Benefits to be recognized:

- Improved shop facilities and enhanced capabilities.
- Fewer components will be returned to suppliers for repairs.
- Facility has been organized to support daily interface of support organizations.
- Maintenance work orders generation and scheduling will be improved through better communications.
- Improved personnel morale will result in improvement in personnel performance.

Equipment Concerns

- Main Feedpump Turbine
- Steam Feedwater Rupture Control System
- Auxiliary Feedpump Turbines
- Auxiliary Feedwater Turbine Trip & Throttle Valves
- Auxiliary Feedwater Valves AF 599 and AF 608
- Pilot Operated Relief Valve
- Main Steam Headers
- Main Feedwater Startup Control Valve
- Auxiliary Feedwater Pump # 1 Suction Supply
- Main Steam Valve MS-106
- Nuclear Instrumentation Neutron Source Range Detectors
- Turbine Bypass Valve
- Safety Parameter Display System

Issue/Concern Resolution Flow Chart



Main Feedpump Turbine (MFPT)

Concern:	Overspeed tripping of MFPT 1-1 initiated a plant runback.
Findings:	Failed circuit board capacitor in General Electric control system.
Corrective Actions:	1. Replace faulted board. 2. Check and test control circuits for both MFPT 1-1 & 1-2.
Generic Implications:	None-problem is specific to MFPT control circuits.

Steam Feedwater Rupture Control System (SFRCS)

Concern:	Spurious SFRCS actuation closed both main steam isolation valves and isolated steam to main feedpump turbines.
Findings:	Turbine trip caused pressure oscillations which SFRCS detected as low steam generator level. Level pressure tap was made more sensitive due to transmitter changeouts.
Corrective Action:	Add electronic filtering to signals.
Generic Implications:	Increase in sensitivity/response can result due to transmitter changeouts. Installing filtering in Reactor Protection System flow transmitter circuitry.

Auxiliary Feedpump Turbines

Concern:	Both auxiliary feedpump turbines tripped on overspeed - this prevented supply of water to steam generators.
Findings:	Condensation in long steam inlet lines disrupts proper turbine control.
Corrective Actions:	1. Keep lines hot with steam to greatly reduce water formation. 2. Improve governor controls.
Generic Implications:	None-no other quick start steam driven turbines.

Auxiliary Feedpump Turbine Trip and Throttle Valves

Concern:	Operators experienced problems resetting the valves - delayed initiation of auxiliary feedwater to steam generators.
Findings:	Procedures and prior training not sufficient.
Corrective Actions:	1. Provide improved hands-on training. 2. Provide placards and local indicators on T&TV to help operators. 3. Enhance communications between pump rooms and from pump rooms to Control Room.
Generic Implications:	Other crucial operator actions performed locally. Covered by Operator Actions review.

Auxiliary Feedwater Valves AF 599 and AF 608

Concern:	Valves failed to open on demand after closing earlier - would have prevented auxiliary feedwater flow.
Findings:	Motor operators on valves were not properly adjusted allowing valves to "torque out".
Corrective Actions:	1. Readjust AF 599 and AF 608. 2. Evaluate and readjust other motor operated valves. 3. Test valve operations. 4. Provide new maintenance procedures.
Generic: Implications:	Applicable to other motor operated valves

Pilot Operated Relief Valve (PORV)

Concern:	During transient PORV failed to close properly after third opening - closure of the block valve isolated the PORV and it reseated.
Findings:	No physical evidence found to explain improper closure - foreign material in pilot cannot be ruled out - performance similar to industry experience.
Corrective Actions:	1. Testing of valve - old/new. 2. Add acoustic monitor flow indication light on PORV control panel. 3. Change PORV annunciator light from white to red. 4. Improve panel labeling of solenoid open/close switch. 5. Provide for PORV exercising during shutdowns.
Generic Implications:	None-no valves of similar design.

Main Steam Headers

Concern:	After closure of main steam isolation valves, pressure control problems were experienced in the main steam headers.
Findings:	Manual actuation of atmospheric vents valves (AVV) caused large pressure drop in header # 1 - AVV control circuitry on header # 2 is a lesser concern. Switch contacts corroded on ICS module.
Corrective Actions:	1. Full check-out and adjustment of AVV control circuitry. 2. Testing of main steam safety valves and refurbish as needed.
Generic Implications:	Switch contacts being evaluated on other ICS modules.

Main Feedwater Startup Control Valve

Concern:	Operators were uncertain of status of control valve SP-7A due to blown light bulb.
Findings:	Valve operated properly - technician inserted incorrect voltage lamp during event.
Corrective Action:	Provide additional information to operators.
Generic Implications:	None-no significant findings.

Auxiliary Feedwater Pump # 1 Suction Supply

Concern:	Pump suction transferred from normal to backup water supply about 20 minutes after reactor trip.
Findings:	No impact to steam generator - transient low suction pressure caused transfer.
Corrective Actions:	1. Remove/replace strainers. 2. Revise transfer switch setpoints. 3. Provide time delay.
Generic Implications:	Other pump suction transfer systems.

Main Steam Valve MS-106

Concern:	Valve positon indication recorded as closed to not closed to closed in about one-third the expected time - this valve is used to admit steam from steam generator # 1 to auxiliary feedpump turbine # 1.
Findings:	Motor operator on valve was not properly adjusted.
Corrective Action:	Readjust and test valve.
Generic Implications:	Other motor operated valves.

Nuclear Instrumentation Neutron Source Range Detectors

Concern:	Prior to event NI-1 was inoperable and NI-2 failed during transient - previous problems had been experienced.
Findings:	NI-1—inadequate grounding of shield found at preamp due to paint and lack of star washers. NI-2—intermittent failure of containment penetration cable center conductor. Triax cable connectors also found degraded in each detector string.
Corrective Action:	1. NI-1—proper ground established 2. NI-2—using spare penetration. 3.Replacing/refurbishing connectors as required.
Generic Implications:	Preventative maintenance program needed for source range, intermediate range, and power range connectors.

Turbine Bypass Valve

Concern:	Pneumatic actuator assembly cracked and failed during cooldown operations several hours following reactor trip.
Findings:	Internal valve components became disengaged and caused hammer blow forces which damaged actuator.
Corrective Action:	1. Repair damaged valve. 2. Repair steam traps and drains. 3. Refurbish other turbine bypass valves. 4. Revised operating procedure to assure proper drainage of headers.
Generic Implications:	Applies to both turbine bypass valve headers.

Safety Parameter Display System (SPDS)

Concern:	Both SPDS Control Room display devices were inoperative during event - they are intended to be used by the operators during transients.
Findings:	Bad fiber optic cable and faulty terminations on data transmission cable.
Corrective Action:	1. Use spare cable. 2. Correct terminations. 3. Replace obsolete terminal.
Generic Implications:	None-no other fiber optic systems.

System Review and Test Program Program Objectives

The objectives of the System Review and Test Program can be stated as follows:

- Evaluate systems important to safe plant operation to identify known significant or recurring maintenance and operations problems and propose corrective actions, where appropriate.
- Evaluate the scope of existing surveillance testing on systems important to safe plant operation to identify any additional testing required to assure that systems will perform their specified functions.
- Based upon the surveillance test evaluation, and testing requirements identified to verify the adequacy of the new system modifications, prepare and conduct a test program to assure that systems important to safe plant operation are fully functional.
- Complete this program on a schedule consistent with the timely restart of the unit.

System Review Program
Specific Systems Included

Group 1	Reactor Coolant System
	High Pressure Injection
	Core Flooding System
	Decay Heat Removal and Low Pressure Injection
	Containment Spray System
	Containment Emergency Ventilation
	Containment Air Cooling and Hydrogen Control
	Makeup and Purification System
Group 2	Electrical 125/250 VDC (Includes Battery Room H&V)
	Electrical 4.16 KV System (13.8/4.16 KV Transformers)
	Electrical 480 V Distribution (Includes Inverters and Required Transformers)
	Electrical 13.8 KV System (Includes Startup and Auxiliary Transformers)
	Emergency Diesel Generators (Includes "Q" Fuel Oil Tanks and Diesel Room Ventilation)
	Instrument AC Power (Includes Inverters and Required Transformers)

System Review Program Specific Systems Included (Cont'd)

Group 3	Anticipatory Reactor Trip System
	Control Rod Drive Control System
	Incore Monitoring (Includes Core Exit TC)
	Reactor Protection System
	Steam and Feedwater Rupture Control System
	Safety Features Actuation System
	Integrated Control System
	Security System
Group 4	Control Room Normal and Emergency H&V Systems
	Station and Instrument Air
	Station Fire Protection
	Component Cooling Water System
	Service Water System
Group 5	Auxiliary Feedwater System
	Main Steam
	Steam Generator System
	Main Feedwater System

System Review and Test Program
System Review Methodology

- Five system review groups.
  - Headed by Toledo Edison engineering personnel.
  - Supported by highly-qualified industry representatives.
- Selected documentation review
  - LER's, DVR's
    NPRDS Data
    MWO's
    FCR's
    HED's
    TAP Reports
- Focused interviews of operations and maintenance personnel.
- Evaluation/decision making guided by consistent, specific criteria/review process.
- Preparation of suggested corrective actions.
- Preparation of report documenting findings and recommendations.
- Overview and decision by a designated independent system review group.

System Review and Test Program Surveillance Test Review

- Each group will review their respective surveillance tests for completeness and test adequacy considering design basis conditions.
- Identified concerns will be documented and recommended test outlines developed.
- Independent system review group will provide oversight and will approve the test outlines.
- As appropriate new or revised surveillance tests will be developed, approved and conducted in accordance with existing procedure and test programs.
- Outlines for post-modification testing will be prepared in conjunction with surveillance test review. New test procedures will be prepared where testing beyond surveillance tests is deemed necessary.
- System review group will review tests performed and will assume responsibility for rectifying problems.

Actions Concerning Motor Driven Feed Pump Pre-Start Up

Install new motor driven feed pump prior to startup.

New pump design features:

- Provides 100% capacity auxiliary feedwater flow.
- Pump discharge aligned to the auxiliary feedwater headers during normal full power operation.
- Pump suction normally from the condensate storage tank.
- Pump capable of being started from the Control Room.
- Pump motor can be supplied from either emergency diesel generator following a loss of offsite power.
- Can be manually realigned to feed the main feedwater system. This will be the normal alignment during low power operation. Pump suction in this alignment will be from the DST.

Following installation and initial operation, common suction line strainer will be eliminated.

Analysis Program

- Evaluate effects of the transient on selected equipment.
- Develop and benchmark Relap 5/Mod 2 Davis-Besse specific transient simulation capability.
- Evaluate adequacy of Makeup/HPI cooling.
- Investigate the acceptability of proposed operational and system improvements.

Current Status

Equipment Area

- Steam generator—no significant effects.
- AFW supports—no damage due to the event.

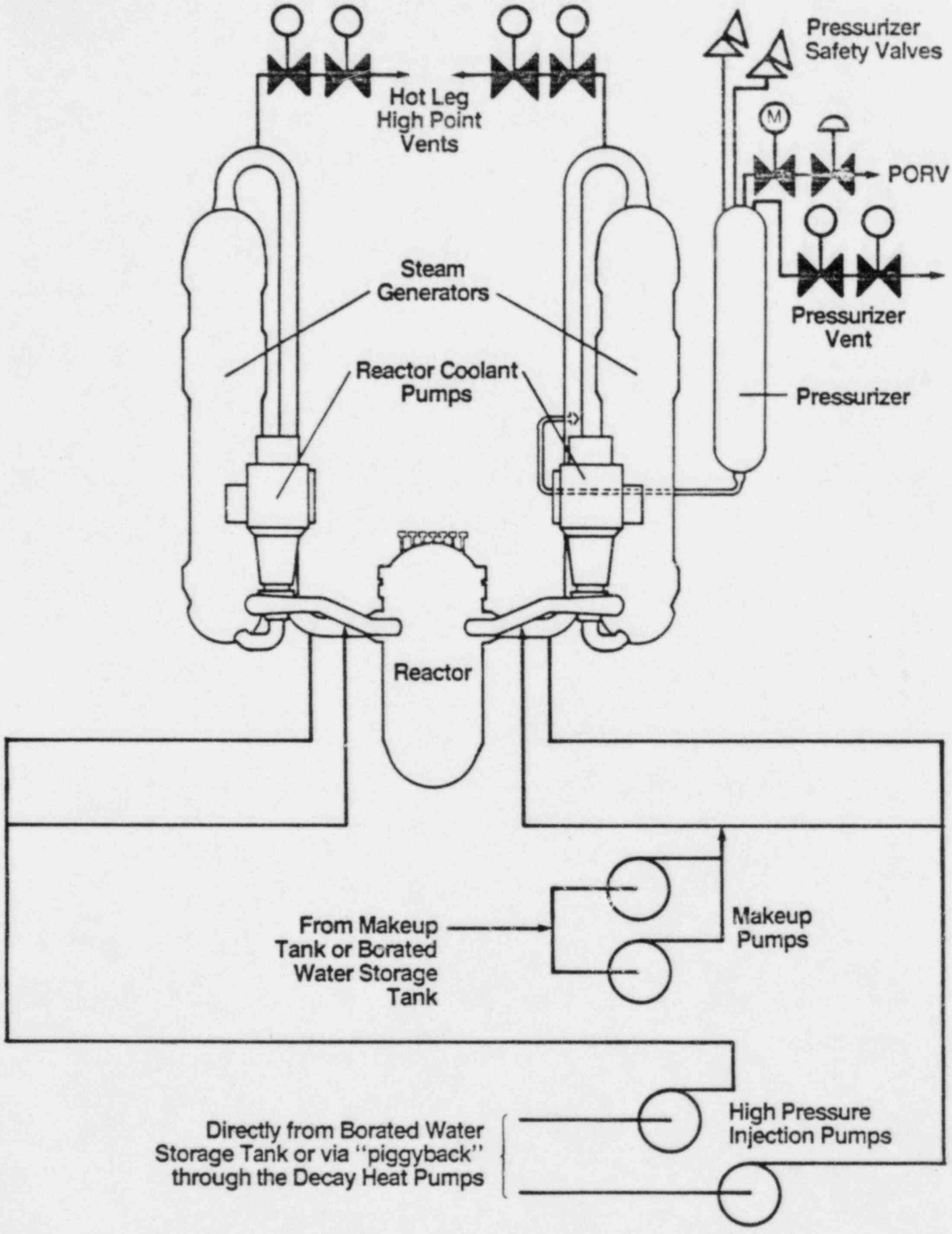
Transient Model

- RELAP 5/Mod 2 Model is OTIS benchmarked.
- On June 9, makeup/HPI cooling would have been adequate.
- Makeup/HPI cooling will mitigate full power loss of all feedwater cases at Davis-Besse.

Operational and System Evaluations

- Ongoing to identify if previously bounded.

Decay Heat Removal by Makeup/HPI Cooling



Quality Attributes of The Davis-Besse Makeup System (Injection Portion)

Makeup Pumps	2-safety grade, seismically qualified, 450 HP twelve stage continuous service, centrifical pumps.
Makeup Pump Cooling	
Lube Oil	Safety grade.
Ventilation	Non-safety grade.
Electric Power	Fed directly from the safety related buses (not load shed).
Seismicity	Injection portion constructed Class I.
Water Source	Normal - Makeup Tank. Emergency - Borated Water Storage.
Control	Injection configuration is controlled from Control Room.
Technical Specifications	Operability of both pumps covered similar to ECCS technical specifications.
Qualification	Majority of system outside containment; much in non-harsh environment.
Hazards (Missiles, etc.)	Not reviewed as safety related.

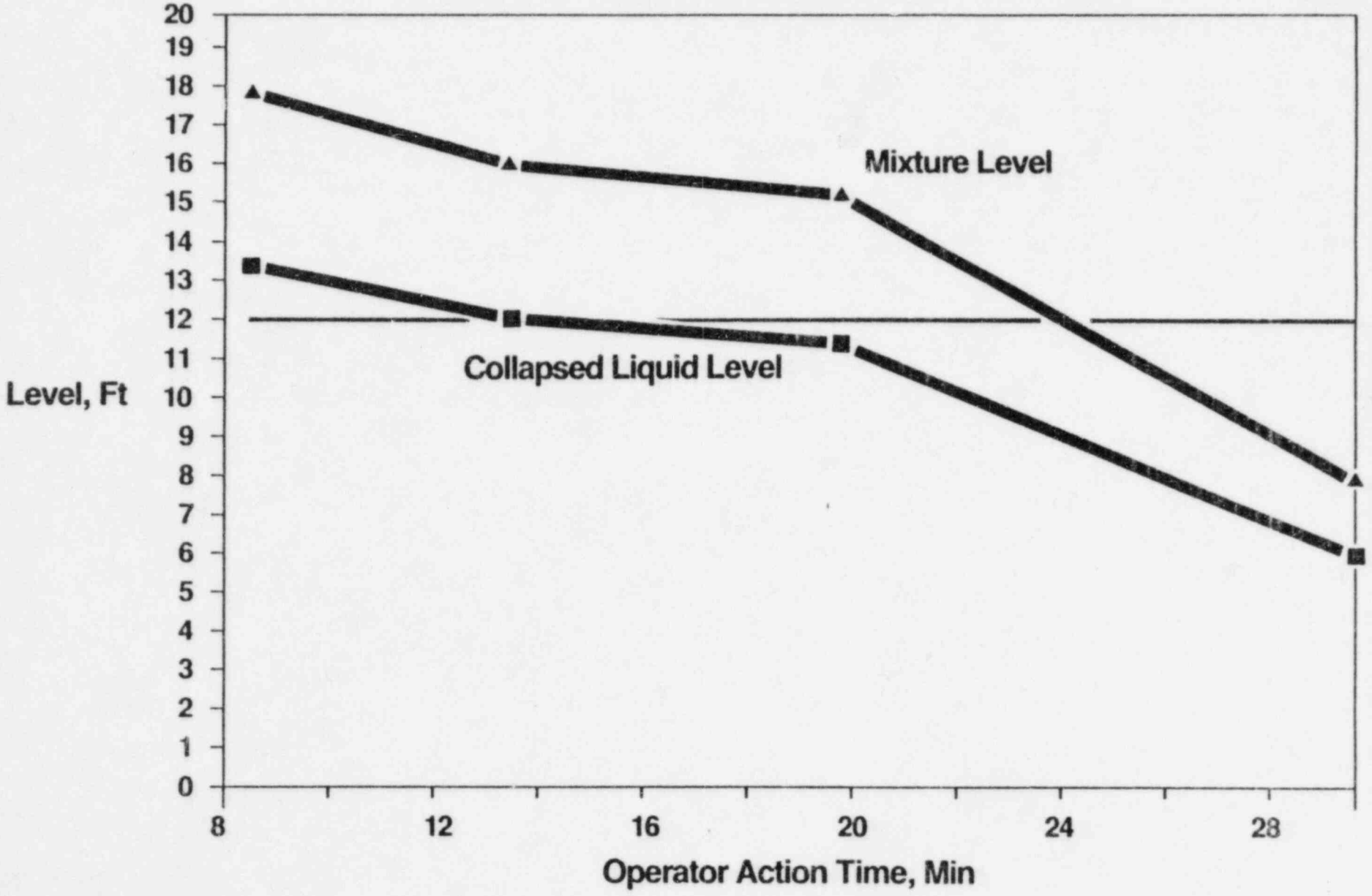
Feed and Bleed Cooling Evaluation

TOTAL LOSS OF FEEDWATER FROM 100% POWER

Assumptions:	Power	1.02 x 2772 MWT
	LOFW	Time Zero
	Reactor Trip	15 Seconds
	Makeup Flow	2 Pumps initiated at operator action time
	PORV	Blocked open at operator action time

Operator Action Time Matrix:	Case	Operator Action Time
	1)	8.5 Minutes
	2)	13.5 Minutes
	3)	20.0 Minutes
	4)	30.0 Minutes

Core Level vs. Operator Action Time



Decay Heat Removal Reliability Improvement Program

Task Force Effort

- Chartered to review all systems used for decay heat removal.
  - Main Feed and Steam
  - AFW
  - SUFP
  - SFRCS
  - Feed and Bleed
- Identified changes to improve operational reliability and to reduce complexity of SFRCS.
- Broad Membership
  - Experience in design, engineering, operations.
  - Included outside expertise:
    - MPR Associates
    - Babcock and Wilcox
    - Cygna

Task Force

Objectives:

- Reduce frequency of demand for emergency decay heat removal.
- Reduce number of automatic system responses required to initiate auxiliary feedwater.
- Reduce potential for common mode failure.
- Evaluate diverse and redundant means of decay heat removal.

Goal:

- Provide equipment recommendation that would improve reliability of systems used for decay heat removal. Specific improvements for the AFW should eventually achieve SRP reliability criteria.

Task Force Methodology

- Multiple "techniques" used.
  - Deterministic
  - Preliminary Scoping Analysis
  - Engineering Judgment
  - Assessment of existing PRA's
- Reviewed Documentation.
- Evaluated past operating experience.
- Interviewed Toledo Edison personnel.

AFW/SFRCS Reliability

Reduction of spurious initiators:

- Filter existing steam generator level signals.
- Improve SFRCS power supply performance.
- Remove main steam and main feedwater isolation on SG low level.

AFW/SFRCS Reliability

AFW initiation to SG—improvements:

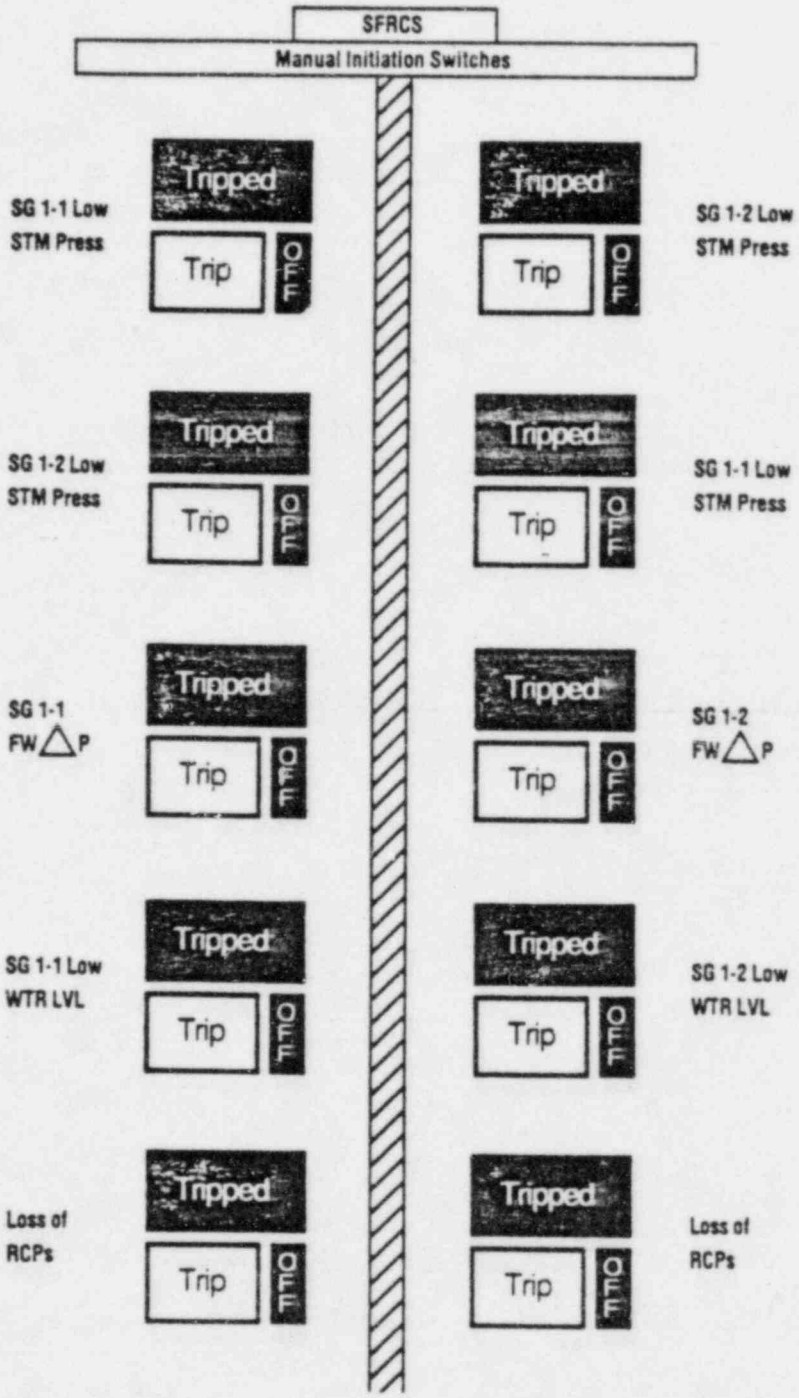
- Valve motor operator improvements.
- Valve flowpath reductions.
- Depower CST to AFWPT suction valves.
- Provide hot steam lines to AFW pumps.
- Disable feed isolation to last steam generator depressurized.
- SFRCS panel revision.

AFW/SFRCS Reliability

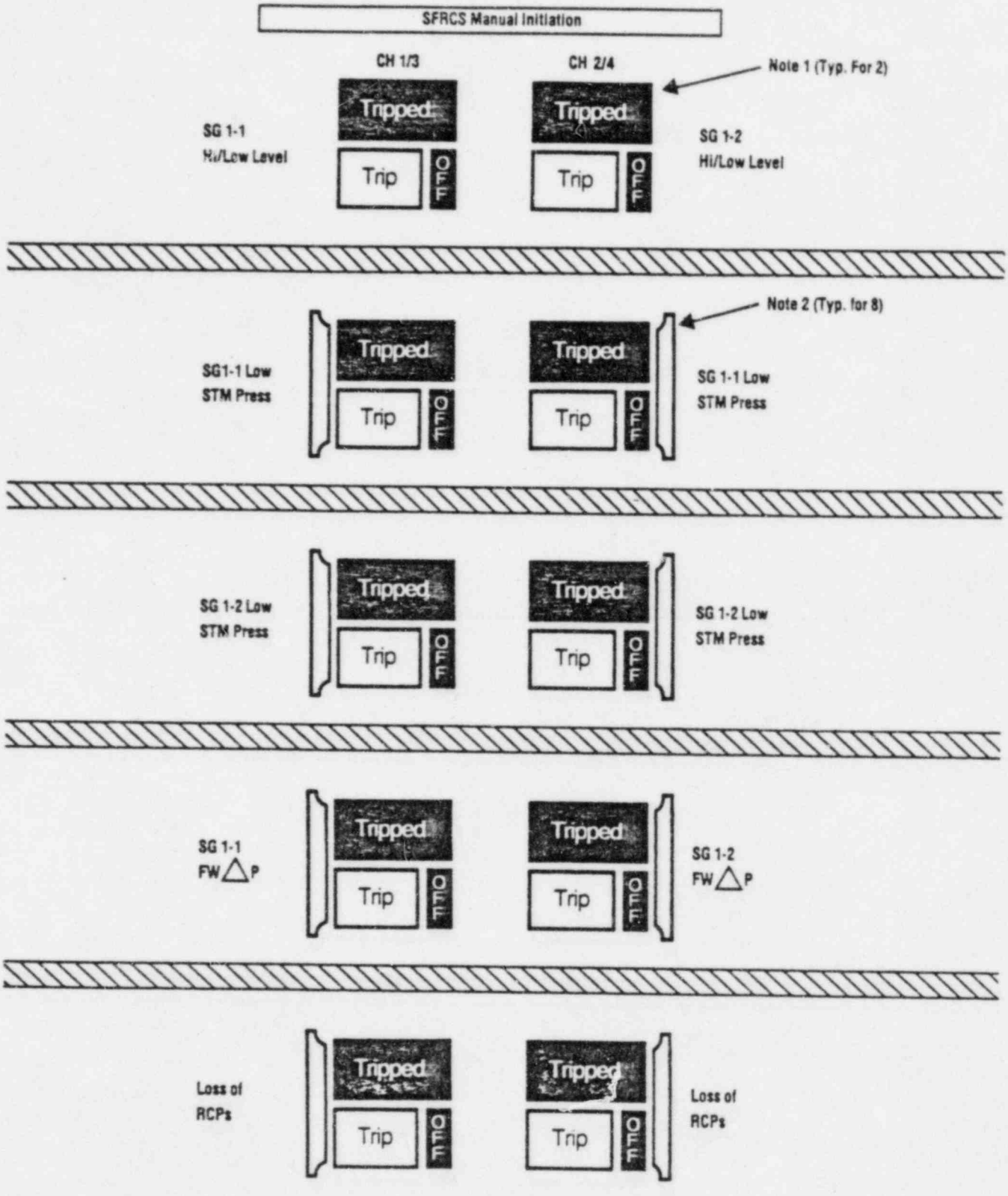
AFW continuation improvements:

- Install PGG governor on AFPT-1.
- Provide seal-in manual reset for SFRCS full trip alarm.
- Remove AFW pump suction strainers.
- Resize strainer from CST.
- Revise AFP suction transfer scheme.
- Install local position indication for AFPT trip throttle valve.

Original Layout



Revised Layout



Notes:

1) Cutler Hammer Full Shroud (No Window) Cat # E30KT6 (Gray)
2) Cutler Hammer Guard With Clear Plastic Sliding Window, Cat # E30KR32 (Red)

Longer Term Decay Heat Removal Reliability Improvements

- Increase margin between SFRCS trip and ICS low level limit.
- Improved AFW level control.
- SFRCS logic revision to further minimize isolation.
- Control Room "mimic" panel for finalized AFW/SFRCS.

Operational and Procedural Changes

Shift Technical Advisor (STA)

- Shift schedule changed from 24-hour duty day to rotating 12-hour shifts.
- STA spends entire shift within protected area.
- STA office located within 1-2 minutes of the Control Room.
- Trained as Interim Emergency Duty Officer to advise the Shift Supervisor in event classification and Protective Action Guidelines.
- New class of STA'S currently in training will be SRO licensed and part of normal shift complement.

Operational and Procedural Changes

NRC Notification

- Checklist provided in the Control Room to ensure information provided to the NRC Duty Officer is timely and accurate.
- Additional training will be provided to personnel responsible for NRC emergency notifications.

Operational and Procedural Changes

Emergency and Abnormal Procedures

- SRO required to remain in the Control Room directing actions of the RO once EP 1202.01 is implemented.
- Review all Emergency/Abnormal Procedures to assure clarity of instructions when unusual actions are required.
- Review all Emergency/Abnormal Procedures to assure Control Room instrumentation is adequate to support the decision statements requiring operator action.
- Provide manual pressure-temperature plotting capability on the operator console.

Operational and Procedural Changes

Emergency and Abnormal Procedures

- EP 1202.01 will be modified to:
  - Provide definitive criteria for Makeup/HPI cooling.
  - Correct SFRCS response verification.
  - Realignment of Auxiliary Feedwater mini-recirculation flowpath.
  - MSIV status verification.
  - New motor driven feedwater pump operation.
  - Criteria for AFW suction transfer from service water to the CST.

Operational and Procedural Changes

Training/Administrative

- Increased emphasis by management and training on adherence to procedures.
- Pre-startup training of all operators on high priority-infrequent operator actions (e.g. AFWT-trip throttle valve).
- Manual vs. automatic safety system actuation.
  - Operating philosophy changes requiring reactor operator to inform senior reactor operator of intent to manually actuate system.
- Pre-startup training for licensed operators.
  - Loss of feedwater events.
  - Control logic and operation of AF 599/608.
  - SFRCS changes and actuation.
  - Control of steam header pressure following a reactor trip.
  - Simulator training (starting 8/26/85) includes SFRCS mock-up and manual P-T plotting (assumes inoperable SPDS).
  - Other new hardware modifications.

Training Program Enhancements

Management Involvement

- Training Department elevated to Division status.
  - Recognition.
  - Desirability.
  - Morale.
- Director level management reporting to Senior Vice President, Nuclear.
  - Upper management attention.
  - Support.
  - Better able to address training issues.

Training Program Enhancements

Staffing

- Training supervisors to manager level.
  - Promotion path within Training.
  - Appropriate level to work with Mission counterparts.
- Training instructors elevated to comparable level with Station positions.
  - Attract high caliber personnel.
  - Alternate career option.
  - In line with other utilities.

Training Program Enhancements

Staffing (Cont'd)

- Nuclear Training staffing levels.

  41 positions currently approved.

  35 filled by Toledo Edison people.

  6 offers awaiting responses.

  This is being supplemented by 10 additional contract personnel.

- Progress

8/84		8/85
24	Approved Positions	41
17	Toledo Edison Staff	35
2	Contract Instructors	10

- Additions

  Additional staff will be needed to support the simulator and expanded maintenance training. Approximately 55 total.

Training Program Enhancements

Program Improvements

- INPO Accreditation
  - NUMARC commitment.
    - All programs ready by December 1986.
  - Operator Programs (NLO, RO, SRO/SS)
    - Expect to be ready by December 1985.
    - INPO to review draft SER in October.
  - Remaining programs (Mechanical, Electrical, I&C, Chemistry, Health Physics, Shift Technical Advisor, Technical Staff and Managers)
    - Concerted effort to have these programs ready prior to December, 1986.
    - Expect maintenance programs to be ready closer to mid-1986.
- Clarification of responsibilities for training functions.
  - Drafting procedure defining responsibilities.
    - Training responsible for development and implementation.
    - Line organization responsible for training and qualification of assigned people.

Training Program Enhancements

Upgrading of Facilities

- New Training offices and classrooms.
  - Doubled number of classrooms.
  - Much improved learning environment.
  - New furniture.
- Significant parking lot project.
  - Nearing completion.
- Dedicated Training labs to be completed December, 1985 for:
  - Mechanical
  - Electrical
  - Instrumentation & Control
  - Chemistry
  - Health Physics

Quality "Hands On" Training

Training Program Enhancements

Upgrading of Facilities (Cont'd)

- Plant specific simulator will be built.
  - Finalizing design specifications.
  - Nearly 300 simulated malfunctions will be availabie to test and evaluate operators.
  - Bid and review process early 1986.
  - 32-36 month lead time.
  - On site and operable by December, 1988.

9/85

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Meeting Title: Cont of 7/24 Briefing on Davis-Besse

Meeting Date: 9/17/85 Open X Closed ____

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