ORIGINAL ACRST-2003

OFFICIAL TRANSCRIPT OF PROCEEDINGS

Agency: Nuclear Regulatory Commission
Advisory Committee on Reactor Safeguards

Title: 408th ACRS Meeting

Docket No.

LOCATION: Bethesda, Maryland

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UNITED STATES NUCLEAR REGULATORY COMMISSION

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

DATE: April 8, 1994

The contents of this transcript of the proceedings of the United States Nuclear Regulatory Commission's Advisory Committee on Reactor Safeguards, (date) April 8, 1994, as Reported herein, are a record of the discussions recorded at the meeting held on the above date.

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

408th ACRS MEETING

Nuclear Regulatory Commission

Conference Room P-110

7920 Norfolk Avenue

Bethesda, Maryland

Friday, April 8, 1994

8:33 a.m.

ACRS MEMBERS PRESENT:

E. WILKINS (Chairman)

T. KRESS (Vice Chairman)

C. MICHELSON

C. WYLIE

H. LEWIS

I. CATTON

J. CARROLL

W. LINDBALD

P. DAVIS

R. SEALE

W. SHAEK

S. DURAISWAMY (Designated Federal Official)

J. LARKINS (Executive Director of the ACRS)

PRESENT FROM NRC/NRR:

H. CHRISTENSEN (NRC Region II)

P. MILANO

E. HACKETT

B. KOO

M. McBREARTY

PRESENT FROM CP&L:

R. ANDERSON

W. ORSER

J. COWAN

R. LOPRIDRE

J. McGOWAN

P R O C E E D I N G S

[8:33 a.m.]

MR. WILKINS: The meeting will now come to order.

This is the second day of the 408th meeting of the Advisory Committee on Reactor Safeguards. During today's meeting, the Committee will discuss and hear reports on the following:

Brunswick Nuclear Power Plant, future ACRS activities, reconciliation of ACRS comments and recommendations, preparation of ACRS reports and strategic planning.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Mr. Sam Duraiswamy is the Designated Federal Official for the initial portion of the meeting.

We have received no written statements or requests for time to make oral statements from members of the public regarding today's sessions.

A transcript of portions of the meeting is being kept and it is requested that each speaker use one of the microphones, identify himself or herself and speak with sufficient clarity and volume that he or she can be readily heard.

Let me put on the record the conversation we just finished.

I am informed that the people from the Brunswick Nuclear Power Plant may be trapped in traffic on the way here. I believe the best solution to that dilemma is to delay the start of the presentation, although we do have -- we could have a part of it right now. If it turns out that they really are going to be delayed, we will go ahead and hear that part and ask you to extend your remarks to the extent feasible so as to try to cover the gap furnished by their absence.

What I propose to do immediately then is get started on future ACRS activities and that's Item Number -- what?

We will now go off the record.

[Discussion off the record.]

MR. WILKINS: We will go back on the record.

Jay, this is your subcommittee. Do you want to introduce the subject?

MR. CARROLL: All right. Well, this morning, we are going to hear a report on the situation at the Carolina Power and Light Brunswick Power Plant. This has been tentatively scheduled for some time and it's consistent with the ACRS policy, if you will, that when a plant has been shut down for longer than a year, we want to at least make a decision as to whether we want to hear about what the problems were and how they were corrected. So we're not

picking on Carolina Power and Light, we have been doing this fairly routinely in the past.

Pat, you're going to lead off and then that will be followed by a presentation from --

MR. MILANO: Carolina Power and Light, yes.

MR. CARROLL: You will find some background material on this situation in Tab Number 9 of your black binder.

[Slide.]

MR. MILANO: Thank you.

Good morning, Mr. Chairman, members of the ACRS, ladies and gentlemen.

I am here this morning to talk about the restart of the Brunswick steam electric plant Units 1 and 2. I will be leading off the presentation. My name is Patrick Milano. I am the NRR project manager assigned for the Brunswick plant.

With me today from Region II is Mr. Chris Christensen. He also, along with I and several others, were part of a review team that evaluated the long and short term actions that were desired for Brunswick prior to their restart.

For Carolina Power and Light there will be Mr. Roy Anderson, the Vice President of the Brunswick Nuclear Project.

[Slide.]

MR. MILANO: Getting started, before we can really go into the recovery efforts, I would like to go through a little bit of the background information to get everybody up to speed as to what transpired that led to the sequence of events.

Brunswick on April 7, 1992, Carolina Power and Light recognized the fact that there was a problem with a steel plated masonry wall between emergency diesel generator number four and emergency bus E-8 that was possibly not capable of meeting a seismic event due to insufficient number of anchors that were in the wall and also through the steel plates on each side of the masonry wall.

Later on that month on April 21, the licensee also identified a poured concrete wall between emergency diesel number one and emergency bus E-6 which also was deficient with regard to seismic bolting.

When it became apparent that other walls in the emergency diesel generator building were also likely to have these type of problems, Carolina Power and Light elected to shut down both units. The Brunswick tech specs require all four diesels to be in operation when either plant is operating. In that regard, it was a tech spec required shutdown.

Going back further than the shutdown, there have

been what we consider a checkered history of performance for the Brunswick plant itself. This goes back even to as far back as to 1982 time frame when Region II issued a confirmatory order which implemented a Brunswick improvement program which was designed to try to get some long-term corrective actions in that time frame. However, I am going to pick up in the 1988 time frame really for purposes of this discussion.

In 1988, the NRC put out its Systematic Assessment of Licensee Performance which basically found four significant areas of concern for this project. One was operator irattention to detail, a higher than expected equipment failure rate, management tolerance of deficiencies and slow action by the engineering support organization to correct design deficiencies.

Based on those findings, NRC management requested that a diagnostic evaluation team inspection be conducted and that indeed was done in May of 1989.

MR. CARROLL: The engineering support organization that you speak of is "downtown" or at the plant or a combination?

MR. MILANO: At that time, it was a combination. The nuclear engineering department was in Raleigh. There was some technical services at the site. That is not what is presently going on now; they are in the process of

decentralizing nuclear engineering, putting -- each site will have its own nuclear engineering support organization and then, furthermore, we are just in receipt of some information that later on this year each one of the sites is going to centralize its engineering functions at the site.

They have got multi organizations, engineering, nuclear engineering, technical support, project engineering, project management. They are going to put those all into one central organization to try to solidify the management control aspects of it.

MR. CARROLL: In that scheme of things, all of those people will report to the site vice president or plant manager?

MR. MILANO: Site vice president.

MR. CARROLL: Okay.

MR. MILANO: Okay. Proceeding on.

While the performance appeared to improve for the first half of the cycle after the SALP, we also found that it was negated by some poor performance in the areas of work control, operator performance in NRC administered examinations, and continuing instances of inadequate engineering support to the plant staff.

Based on those findings -- oh, excuse me. I have skipped something here. Basically what I wanted to say was after the diagnostic evaluation team inspection, Brunswick

came up with another improvement program called the "Integrated Action Program."

That is what I meant to say was the reason for the upturn in performance, but then again, it seemed to slide again as evidenced by the end of that next SALP cycle.

Based on that inability of the integrated action plan to sustain improvement, Region II conducted a series of five special inspections in the early part of 1992 to further assess the root causes. Basically they felt into what I would call two major categories.

One is the quality of the standards and expectations that were being presented by corporate and site management and a lack of a critical self-assessment of the programs and operations at the facility.

[Slide.]

MR. MILANO: Based on those findings, the NRC management placed Brunswick in June of 1992 on the list of plants requiring additional NRC attention. The letter that was provided to CP&L basically covered these six major points which are pretty much similar to what I have said before as to what had been the recurring trends at the plant site.

Repetitive work control failures, personnel errors, management oversight, overall plant material condition, attention to detail, and a self-assessment

program.

MR. DAVIS: What does the plant material condition refer to?

MR. MILANO: Plant material condition refers to a number of things. One is that there have been corrosion problems specifically in the service water system. There were chronic diesel generator problems. Those are the two major ones.

MR. DAVIS: Thank you.

MR. CARROLL: What does being placed on list of plants requiring additional NRC attention mean? Does that mean that they could not restart until they got off that list?

MR. MILANO: No, it does not. It means that --

MR. CARROLL: So it is the second.

MR. MILANO: What it basically means is the input onto the "watch" list, as it is called, does not mean that a plant has to be in a shut-down condition. It means that the NRC is going to expend more of it inspection resources based on the perceived performance of the plant.

MR. CARROLL: Okay.

MR. CATTON: Has this plant done an IPE?

MR. MILANO: Yes, it has. The IPE came in, I believe, it was December of '92. It has not been reviewed. The review of it is on-going. It has not been completed by

the Office of Research yet.

MR. CATTON: Does the IPE reflect any of these problems, or you haven't looked at it yet?

MR. MILANO: I couldn't say.

MR. CATTON: It sounds like organizational factors to me.

MR. CARROLL: The Committee isn't interested in organizational factors.

MR. CATTON: I just thought I would focus them a little bit.

[Slide.]

MR. MILANO: Right after that 1992 placement on the "watch" list, the Regional Administrator of Region II, Mr. Ebneter, sent out a letter to CP&L listing a request for short-term actions that CP&L felt was necessary to restart the plant, and then long-term actions to correct the decline in overall performance, basically asking for a performance improvement program.

This was replied to by CP&L on July 23, 1992, which provided both a description of a proposal for a corporate improvement program, a specific Brunswick start-up plan, and a general structure of a long-term improvement program.

The long-term improvement program came in, in November of 1992 as CP&L submitted its corporate improvement

program. Also included with that in December of 1992 was a Brunswick three-year plan which had specific agenda items or initiatives that were specifically for the Brunswick plan, whereas the corporate improvement program had broader ranging corporate activities in it.

MR. SEALE: Are those dates out of order?

MR. MILANO: Excuse me. Yes, they are. Well, it is not out of order. What it is, is June. Then that should have been July. Corporate improvement initiatives in November and that in December. There was a mix-up in the dates. Excuse me.

MR. SEALE: All right.

MR. MILANO: Lastly, I would like to say that based on the submission of the licensee of both its three-year plan and its the July 23rd letter which indicated all these short-term mostly material conditions that the licensee was committing to correct prior to the restart of Unit 2, a confirmatory action letter was presented or was issued by the regional administrator on December 18, 1992.

[Slide.]

MR. MILANO: Lastly, just to reiterate the key NRC issues leading up to the shutdown were basically, again, the NRC's review of the licensee's failure to set high standards for material conditions, failure to provide support for a overall improvement program, and lack of a critical self-

assessment.

MR. CARROLL: Where would I go in the regulations to find out what adequate standards for material conditions are?

MR. MILANO: I couldn't say that. I would be talking off the top --

MR. CARROLL: So this is sort of a subjective judgment.

MR. MILANO: Yes, it is a subjective judgment, yes.

MR. CARROLL: On whose part?

MR. MILANO: On the part of the both the Region 2 and the NRR's staff.

MR. CARROLL: So it isn't the judgment of one individual, one resident inspector?

MR. MILANO: No, it is not.

MR. CARROLL: Before you would ever suggest that somebody had failed adequate standards, it would be reviewed both at regional level and the NRR level?

MR. MILANO: Yes, it would be. Also, what comes into play here is just trends that we observed and number of safety system failures, down times in various pieces of equipment.

MR. DAVIS: Did the plant management agree with your findings?

MR. MILANO: Yes, they did. That is basically what I was going to say. The licensee did their own self-assessment and had basically came up with similar findings.

What I was going to lead into next, rather than talking for them in particular, I was going to now turn the podium over to Roy Anderson, the Vice President for CP&O, if there aren't any further questions with regard to NRR.

MR. CARROLL: Okay. I guess just one other comment. I hate to see the NRC using words like "high standards." I don't think that is their function.

I think you should have some notion, preferably based on the regulations, of what adequate standards are. I am troubled -- I have always been troubled by the NRC being in the IMPO game of pushing people towards excellence. I know it is tempting, but I don't think it is what you are getting paid for.

MR. MILANO: I understand.

MR. CARROLL: You understand that comment.

MR. CATTON: Jay, if you could tie that high standards for material condition to the results of an IPE or something, that changes it, doesn't it?

MR. CARROLL: Yes, it probably does.

MR. LINDBLAD: And then tie that to safety goals.

MR. CATTON: And somehow organizational factors have got to fit in there, even if our colleagues don't

believe it.

MR. WYLIE: Would you explain that second bullet, what that entails?

MR. MILANO: The failure to provide support for improvement. Basically, what it was was it was felt that the corporate organization was not providing enough resources and support to the engineering or plant staff.

MR. WYLIE: Are you talking about funds? Money?

MR. MILANO: Predominately, yes.

MR. CATTON: Do you have some sort of a scale?

MR. MILANO: No, I do not.

MR. CATTON: For relative spending so that you can -- how do you decide that then? In some areas like real estate you can recognize good management straight away from the amount of money they spend on various things. How do you recognize it here?

MR. MILANO: All I can say in here is that there were at least two previous improvement programs. Both failed to maintain long-term -- show long-term gains.

There were some short-term improvements after the two programs, the Brunswick Improvement Program and the integrated action plans were instituted. They shortly peaked. The improvement trends declined.

We were saying therein is the fact that, based on those indications and the general deterioration of plant

systems, that was indicative of a corporate culture not to set themselves high enough standards.

MR. WYLIE: On that second bullet, I am still sort of puzzled about that. You detected they didn't meet schedules for improvement? Is that the way you assessed that?

MR. MILANO: A number of the improvement programs, yes -- let's talk about the IAP, the integrated action plan -- had both specific actions that needed to get completed and had schedules for completion.

By and large, there was a general trend to meet the schedules, but some of the things either did not get completed or did not get the ultimate goals that were desired by that program, and there was no revision or refocusing of those programs to try to get the underlying goal that was meant.

MR. LINDBLAD: Mr. Milano, now they have returned to power, have they?

MR. MILANO: Yes, they have.

MR. LINDBLAD: And was the critical element, repair of some material, false or was it management issues that was the critical element in retaining the power?

MR. MILANO: I would say the majority of the critical elements were material issues. There were -- I don't know the full numbers of them but they were on the

order of probably 100 different tasking falling into about four or five major groups.

One, corrosion related activities; diesel generators in themselves; seismic issues, like with the masonry walls, and stuff like that. Those were predominantly the critical issues that needed to get completed prior to the restart.

The management and long-term actions, while not tied directly to restart, were the fact that the programs were in place and some movement was going on them. But their completion will take a number of years.

MR. LINDBLAD: All right. Thank you.

MR. CARROLL: Now, at some point we will get into the cracked holdowns?

MR. MILANO: While we are not going to talk in detail to them, the core shroud cracks occurred prior to the Unit 1 restart during its refueling outage.

I am going to talk to the fact that that occurred at a later point in the presentation as we talk about the specifics of the restarts.

MR. CARROLL: Okay.

MR. MILANO: Mr. Anderson?

[Slide.]

MR. ANDERSON: Good morning. My name is Roy Anderson. I am the Vice President of Brunswick Station.

Just as a history, I have been 25 years in this business. I started at the Knolls Atomic Power Laboratory with General Electric Company and then went to GE's commercial business in their nuclear construction and engineering services.

I then went to Boston Edison company at their Pilgrim plant in 1987 and was there until I joined Carolina Power & Light in January of 1983.

[Slide.]

MR. ANDERSON: By way of background for the plant, Carolina Power & Light's Brunswick plant is located on the southeast corner of North Carolina, about 30 miles south of Wilmington and about two miles from the coast. Its cooling system -- it's cooled by river water. It does not have a cooling tower, although, as you can see from the photograph, one was planned.

[Slide.]

MR. ANDERSON: Brunswick Station has two General Electric boiling water reactors of 790 megawatts apiece. The containment is a modified Mark I with a direct torus vent. The units went into service or actually got operating licenses in 1976 for Unit 1 and 1974 for Unit 2.

Pardon?

MR. CARROLL: I was going to say time really flies.

[Slide.]

MR. ANDERSON: Yes, sir. Since that time, the Brunswick plants have had an up and down history, and I think the most obvious example perhaps is the average unit capacity factor is hovering around 50 percent for the units.

[Slide.]

MR. ANDERSON: In 1992, as Pat described, seismic issues were identified in the diesel generator buildings and both units were shut down. Extensive inspections and work went on looking at anchor bolts, code margin issues on anchors and supports, and ended up in a significant amount of work in excess of a year. There were also performance issues and Pat mentioned the confirmatory action letter.

Those issues broke down both into management and programmatic issues, which I will describe briefly.

Our enforcement history and our cyclic performance let to the confirmatory action letter.

MR. DAVIS: Excuse me.

MR. ANDERSON: Yes?

MR. DAVIS: How were the seismic problems discovered? Was this part of an A-46 review or was it part of the PRA that was done early on?

MR. ANDERSON: My understanding, and I don't know, John, if you can help me, but my understanding is it was part of an inspection.

MR. DAVIS: By the NRC?

MR. ANDERSON: I believe it was NRC that found the problems. Yes, Pat?

MR. MILANO: What happened was there was an NRC inspection that took place and one of the actions was as they were looking at some corrective actions that had occurred through some previous deficiencies and when the NRC inspector was going through the paperwork trail for the completion of a previous deficiency, one of which was that there possibly was an error in the through-wall bolting between the two steel plates that reinforced the masonry walls, he came through and found out that a complete evaluation of the other bolts and stuff like that had not occurred, and because of that the Licensee went back and looked further into it, and that is when more of the same problems were found and arose.

MR. DAVIS: Thank you.

MR. CARROLL: Anchor bolts were big in those days.

MR. DAVIS: The bolts were big or the issue was big?

MR. CARROLL: The issue.

MR. ANDERSON: Yes.

[Slide.]

MR. ANDERSON: From the standpoint of management, and it was interesting the comments earlier about management, it was not focused on operations, and it was

rather insular with regards to change.

The organization was centralized, and if I said "centralized empires" that would probably be a description. Training, for example, did not report to the site. It reported to Headquarters, so to communication with Training to get some customer response, the communications went up the site chain across to the corporation, back down to the site and back and forth.

Accountabilities were a process and not product-oriented, if I would characterize an accountability of moving this stack to you but not necessarily solving any issue. This was my observation when I got there.

Communications were poor, as you can imagine, up and down, as opposed to across person-to-person.

Self-assessment again focused on process: Are we following the process, rather than are the results being achieved? I think the results were a series of band-aid fixes, some in the material area. One that comes to mind is our service water system, and we used brackish water from the Cape Fear River; it was carbon-lined carbon steel pipe and we continued to patch it instead of going to copper, nickel or a more corrosive-resistent pipe.

In the plant's history there have been several seawater leaks, service water in the reactor building, and that is just unsatisfactory.

MR. SEALE: Could I ask a question?

MR. ANDERSON: Yes.

MR. SEALE: You had mentioned as one of the symptoms of the insular empire a problem in the training area. Was that difficulty identified in any of the INPO training assessments or evaluations of the plant?

MR. ANDERSON: Yes, sir. I believe it was, and it was also, if I recall back in history, I think it was in 1990 our operators actually failed their requalification exam. I believe it was in '90 or about that time frame, so I mean there were indications that something needed to be done.

MR. CARROLL: But arguably for a utility with a couple of nuclear power plants like CP&L had, some training function in the general office to service the two plants at least made some sense, didn't it?

MR. ANDERSON: I think it does, but if I would -- I guess the characteristic is we have multiple plants, two boilers and two pressurized water plants. From a setting of standards I believe there is a need for corporate oversight. When it comes to a customer-supplier relationship, when an operator needs to be trained and says I need more help on this piece of equipment or a maintenance person says we have gotten new digital controls and I need help -- that should happen just like that. Maybe we're in violent agreement on

that one.

MR. CARROLL: I think we are.

MR. ANDERSON: In any case, there was no focus on people either. There was a tendency in the past to work on the hardware, and unfortunately the hardware without the people is just a monument and whether it runs or not depends on how well we deal with our people.

[Slide.]

MR. ANDERSON: From a programmatic standpoint -- and to some degree, many of these things are a result of that management focus that I described on process as opposed to result, we had a large poorly understood backlog in 1993 when I came.

I wanted to see those that affected safety, those issues, open items that affected safety systems, those that were considered operability, those that were considered reliability -- they were not readily forthcoming, and for a large part of 1993, we sorted that out.

The work tended to be production-driven and not operations-driven. Operations in this business is the ultimate customer. What does the operator need to run the plant? What does it need fixed?

It tended to be that the maintenance folks, if I were to just characterize it, selected the work. I will just overstate the position a little bit -- selected the

work that they worked work. That meant some areas of the plant were left wanting.

There were many temporary conditions. Temporary conditions are work arounds, those things that do not work as they were designed, but you can operate it in manual, level controls that would take operator tours to periodically adjust. Flow control valves where the bypass was used would be a couple of examples.

I would say that the culture and the attitude was to modify the plant and not necessarily maintain it. We have moved against that. My position is I want the best maintained 1975 vintage boiling water reactor type four in the world. But I don't want it modified. If it doesn't work, we will fix it. But I don't want to change because I didn't do maintenance on it. You have to maintain the equipment.

There were large areas of the plant that required anti-Cs, protective clothing, to enter. They were contaminated. Those are inhibitors to doing work. It is a barrier. Anything I have to take off my street clothes and put on anti-Cs and enter that area, that is a barrier from doing work. It is tough to get enthusiastic about changing your clothes and going into those areas.

There were repeat failures. I have a tendency to run from one issue to another.

Now, an important point here is that when I look back at the history of the Brunswick plant, I don't think Brunswick ever lacked for the funds to do the job right. I have run a couple of power plants and the amount of money that they had to do the work necessary was sufficient. I believed that it was not properly focus.

If the feeder reg value needs to be overhauled, you don't replace it. You overhaul it. Sometimes just because it is a 1975 design pump control, doesn't mean it is a bad one if you maintain it. I think the money that was spent very often was in continual change as opposed to maintaining the plant.

MR. CARROLL: In that time frame, what was the plant complement?

MR. ANDERSON: This is an estimate of mine. But the plant had about 800 people, as I recall, 850 full-time CP&L employees.

MR. CARROLL: For the two units.

MR. ANDERSON: And at least that many, if not more, contracted staff. When I came -- which is an issue that I want to get into because programmatically you have to invest in your people. If you don't invest in your people, then you never make a gain. When I came to Brunswick, we had about 850, 900 CP&L employees on site. We had 2,000 contractors.

MR. DAVIS: For both plants?

MR. ANDERSON: Yes, sir. Today we have about 400 contractors on-site and about 1,000 CP&L employees.

MR. CARROLL: Is the objective zero contractors?

MR. ANDERSON: I never say never and I never say always. The objective is to do the work in-house and to use contractors. Contractors provide a valuable resource. They are only a problem when we don't use them correctly.

When you have a technology that I can't afford to have every day, you bring in that technology. You use it. You thank the person. You send them on their way.

When you have a peak work load, and you don't have enough welders for a very short intense maintenance period, you bring them on. You use them. You thank them very much. "See you next time." You send them on their way. But you don't let them stay around to where they start doing the work that the people at the station should do.

I think that was a trap.

MR. CARROLL: That sounds like the speech I used to make.

[Slide.]

MR. ANDERSON: If I describe what I believe were the problem, then the antithesis is the things that we have done over the past year to change that.

We brought in some new key people. It was not a

significant number of people. It was on the order of, in management, maybe 20. But we promoted some people. But we had to get a fresh focus. We had to set a clear vision and a clear mission statement, something that everybody could hang onto.

When you chatted earlier and you talked about management or organization, that is exactly what the issues were. There is fundamentally nothing wrong with that power plant if it is maintained. At least that is my belief.

The vision. We intend to be world class. That means upper quartile in SALP. 81 percent capacity, upper quartile in capacity, and 17.5 mils or upper quartile in cost. It is a business.

The mission statement of Brunswick Station. Everything that anybody does has to get tied back to. Our mission is to provide safe, reliable, economic, and environmental sound electric from nuclear power. Not one with the other. That is important.

We took that mission statement and drove it down in the organization, and anything -- you can come to my station. If you want to talk to supervisors or individual contributors -- anything that anybody does, they can relate back to that.

We focused on people. I will talk a little bit about it with an organization chart. But we unitized the

plant. The plant characteristically had a history of running from one plant to the other. The maintenance force would focus on Unit 1 and do something while it seemed like Unit 2 went to seed. Then it would go back to Unit Number 2 while Unit 1 went to seed.

We unitized the plant. There are two plant general managers. After this I will show you that chart and focused it on OPS. An interesting thing about a nuclear power plant different from a fossil plant is that a nuclear power plant never stops operating if it is at 100 percent or zero percent. Once you have irradiated the fuel, it is always operating.

That means that outage management has to report to the plant general manager because he is responsible for the operation of the plant. That was a change.

We benchmarked, got management involved. We started a backshift surveillance program between the hours of 10:00 at night and 5:00 in the morning. You will find a manager on shift. The objective was to get management with their customers, the operators and the maintenance folks on the backshift to find out what they did.

We gave each manager -- for example, you may be responsible for security. You may get the tag-out procedure because we give each one a tag-out procedure. Your job is to read it, and your job is to go on the backshift and

observe it and talk to the people who are responsible for implementing it.

Then we tell the people on shift to ask this fellow what he does for a living. If he can't give you a good explanation, you tell him the problems you've got with his organization. That works pretty well to get going. (a) it broadens the background, and (b) there is a synergy between the people out trying to support and the people who are being supported.

We initiated a self-assessment. It really comes down to an ownership issue. The self-assessment process was key to our start-up. I will talk about that in a little bit.

But when we did that self-assessment, it was one that -- and it started with me -- using INPO Guidelines which are very good as a standard. I came in. We talked about the people, the process, and the plant, the resources that you had to do your job. I started and established the standard at that point. In the end, each operator certified that they were ready to start up, and if they weren't, we took action.

We brought ownership in with training advisory groups, both operations maintenance and engineering. But, for example, the training group need to have a customer/ supplier relationship because it is an impossible thing if

the trainer -- if the customer, the maintenance person, for example, says that, "I didn't get the training that I needed."

That is a oxymoron in terms because a training group's mission is to provide that training. They can say that I didn't tell them that I needed this training. I didn't recognize it, but they can't say that I was refused it. That has been a change.

Our plans are different. Instead of process, we focused on results. What are the measurables? I like the term, it's called "deliverables." We don't -- I would just give you an example. When I reviewed the plans of the past it would talk about evaluate something.

I don't want anything evaluated. I want to know at the end of this period of time I will be getting a deliverable and it will have the following measurements. I will have a work scope to do, it will be defined by the cost, by the material, by the people, by the plant conditions. That I can understand. But don't evaluate it. Say what you are going to deliver, what can I do with it and that has made a difference.

We have paid for performance. Again, it gets back to accountability. It was kind of interesting, last year it was the first year. We have a 401-K share program. We have to get people interested and understanding that your job is

based on plant performance. So we set our 401-K program in place. Instead of how the company does, so that -- well, in 1992, Brunswick operated for three months then didn't turn a lick for the year. My people participated in the company portion of the share, the 401-K program.

In 1993 we set out specific goals with regard to backlogs in maintenance, errors, reliability of emergency core cooling systems, accreditation of training programs with INPO. Their ability to participate in the program depended on their performance. That's kind of interesting.

As it turns out, by the way, we participated 100 percent, the people rallied. But that's different in the past.

[Slide.]

MR. ANDERSON: A little bit on the organization. As was mentioned earlier by Pete, we decentralized our organization and focused it on the site. Training which used to report to headquarters now reports on site. Licensing, over here in regulatory affairs, used to report to headquarters; it now reports on site.

We do have a central licensing arm to look at generic issues. But the specific issues that we deal with on the site come from the site.

Nuclear engineering department, as we talked about earlier, now reports to the site. There is a central --

there is a vice president of nuclear engineering for common issues but as regards customer focus, operations focus, supporting the needs of the plant, nuclear engineering is located on site.

We focused on ops. I mentioned earlier that we unitized. We established a new position called director of site operations and gave him the resources, that is radiological controls, the work control system. We unitized the plants. There are two plant managers here. The training and technical support, which I would call the system engineers, those people that monitor system performance.

You will notice also that, again getting back to the position that the plant never stops operating, it's 100 percent, it's zero percent, fuel in, fuel out, you always have to treat it like an operating plant. I mean, the fundamental issue when we talk about shutdown risk is treat it like an operating plant.

Outage management group reports to the plant general manager. Right now we have just completed -- we had both units up and running and Unit Number 2 completed the longest run in its history, the first breaker to breaker run, meeting its commitments. That plant manager is in an outage and it's his responsibility -- previously we used to have an outage organization and it was almost like the

responsibility of the plant was turned over to the outage group and when they were done work they would give it back. We don't do that anymore. My opinion is it's a wrong way to do business.

We've also, to focus on ops, we've initiated senior reactor operator training. The real issue is integrated plant knowledge. Part of having a spotty history is not understanding. You may have a great electronics technician but the person does not understand how the integrated plant works. So we initiated a certification program. It's similar to the license program in all aspects except that we don't require that person to become proficient in the maneuvering of the control room switches. We are sending all our managers through that.

If I had to list them, I am certified on a boiling water reactor. John Cowan, who is here today, the site director, is certified on a boiling water reactor. The regulatory affairs manager is certified on a boiling water reactor. The work control manager is an ex-SRO. Both plant managers, both ops managers, both maintenance managers, one of the outage managers and the tech support manager have all been certified. They understand integrated knowledge of the plant.

We have also increased the number -- this is an investment in people -- increased the number of people going

through the SRO program. It is kind of interesting, the original title when we got there was the Brunswick Nuclear Project. We are not the Brunswick Nuclear Project; we are the Brunswick Nuclear Plant. We are through building that plant. Let's maintain it and run it.

The shift is then the success chain has got to come up through operations. If you're a bright, hard charging engineer, your best opportunities are to license and to do a short stint in ops to understand how the plant works before you go off into mechanical or electrical or civil or before you become a maintenance supervisor. Because then how do you say, the errors that are made by lack of knowledge of integrated plant are a lot fewer. The dependence on a few people in the control room to make sure things don't conflict doesn't occur. We have seen the benefit of that, again, the long runs, the work control center.

We established organizations around deliverables and I have two examples here. Right now I think nuclear engineering. We had a nuclear engineering group that reported to Raleigh and we had a modifications group down here. Sometimes you'd hear these conversations that went along the line where the designer says the constructor, the modifications group couldn't construct their way out of a wet paper bag if you gave them a knife and instructions.

And, of course, the constructor says that the engineer couldn't engineer their way out of a wet paper bag if you gave them instructions. We put those two groups together.

The deliverable is a modification, if this is what we're doing, to the plant. Not a mod package, a working modification. So we broke that boundary down.

Work control. Work control took operators out of the plant, moved them over and now work control manages the work, assigns the work.

As I mentioned earlier, maintenance used to assign it, now ops decides the priorities. We don't have system hiccups. We don't take a piece of equipment out twice when you can only take it out once and get all the work done. We don't run a surveillance to test a piece of equipment and then take the equipment out and do maintenance and have to run the surveillance to test operability. We just don't do that anymore. It all came around work control.

Which is interesting, because if you talk to my maintenance supervisors, they will tell you that work control is onerous. However, when I look at results, the result is that the productivity is two times what it was when we didn't have work control and maintenance selected what they wanted to work on and when, which is interesting.

I think also because of unitizing and because of going after the SRO chain, the integrated plant knowledge

chain, we have built depth into the organization, and that will come into the future with sustaining this.

[Slide.]

MR. ANDERSON: From a programmatic standpoint, we view self-assessment to drive standards and re-baseline the organization.

The start-up readiness process was a self-assessment where each organization, down to an individual, had to certify that they were ready to go and go through their resources. When they talk about the organization, the number of people you have, the training that they have, the status of your procedures, the equipment that you need to do your job.

It also empowered people. When we started up it had been in the past that management decided when the plant was ready to start up. We didn't do that this time.

We had operators and system engineers walk each of the systems down, and they had to certify to us that it would be reliable.

Now, we put bounds on it. I wanted every licensee event report reviewed, every repetitive failure looked at, and I wanted to know why it wouldn't occur or, if it was something we were not prepared to deal with, what we were going to do to mitigate it if it did occur. But it was very successful.

When we got ready there was a great deal of confidence down in the ranks that we were ready to roll, and I think the performance has demonstrated that.

Again, the work control process, which I mentioned earlier, we used an X-senior reactor operator to run that, we used SRO on a shift rotating basis to maintain the program, and, as I mentioned earlier, we have seen a factor of 2 increase in productivity.

Also, I will give some credit to Maintenance because some of the training we did, the rework has also gone down.

We've implemented an effective performance management program, which is a series of evals. When you do a self-assessment and you go to re-baseline the organization, you have to translate the mission -- safe, economic, reliable, environmentally sound -- to things that organizations do and that you can measure.

It has to come down to people where you have some clear expectations and accountabilities, and that is what we have done.

It is not negative. It can be, certainly. I mean, we have had our fair share of moving people along, but it can be just as well with incentive awards, with performance awards, which we have done.

From the standpoint of knowing where we are and

where we are going we benchmark. That means going out and visiting plants that do things the best. We have done that on a significant basis. We establish peer groups.

Because we are, as you mentioned, a multi-nuclear unit utility, we have the benefit of being able to have all the maintenance managers get together and look not only internally at what we do best, but also go externally, either on IMPO reviews or on our own to look at plants that do something better than we do.

In other words, don't wait until you have a problem to say let's go fix it. But let's go proactive and look forward and find out somebody that does something better than we do. It makes us less insular; it makes us more involved in the industry.

[Slide.]

MR. ANDERSON: I think the results are that we have seen a cultural change. We have a questioning attitude at the station. There is not a fear to ask why anymore.

Out of the system walkdowns, other than the confidence that the engineer and the operator believe the system would support, the next largest benefit or maybe the greatest benefit was people were not afraid to question why we are doing something anymore. It is not a monolithic "management wants it done." We don't do that. Everyone has a say.

We have measurable milestones. Pat Milano mentioned our three-year plan. We have a three-year plan. We have transitioned it to the business plan. Set milestones, accomplish milestone. And we have a mission.

Unit Number 1 start-up and some examples of performance, we had the smoothest start-up in the units history. Maybe the smoothest start-up of a boiler, I don't know, on Unit Number 2.

We took the lessons that we learned from Unit Number 2 and applied them to Unit Number 1. Unit Number 1's start-up was better. It took less time, and the mistakes were the pieces of equipment that we found wanting or not wanting in Unit Number 1 start-up.

Unit Number 2 for the first time in its life ran breaker to breaker 312 days. And the long-run isn't significant in itself. The mission is high capacity factor, and if that occurs every 150 days, you shutdown to fix something on a plan basis, that's fine.

The significance, I think, though is that the work that the people selected, the engineers and the operators that walked through the reviews of past histories as to why repetitive problems occur and what we did about them was a success.

Unit Number 1 has been critical since February 1st of this year and runs continuously.

We have set out its priorities. I mentioned earlier that we had an issue where we had a large undefined backlog. I think, again, the unit runs. That we did get to the right work, and it was prioritized correctly, and we continued to work it off. The backlogs continued to go down. We did 17,000 maintenance items in the past year.

From the standpoint of people, we invest in them. We have a succession plan. One thing that we didn't have in the past, because everybody has to know what their strengths development needs are, and then we have to do something about them, so we built in-depth in that respect.

I sent last year every manager and every supervisor to management training. Supervisor training took a month to do. That training was beginning to bleed me white of people, but in the end it paid off.

Most of our supervisors at the station had never been through a supervisory training course. Now all of our supervisors have been through a supervisory training course.

Again, I mentioned the SRO training, the training advisory group's ownership of the process, and new facilities.

I have some pictures of the plant. I would just like to comment because I have talked a lot about the people and the change here. What you are about to look at is either a monument or an operating plant, and the difference

between the two is the people.

[Slide.]

MR. ANDERSON: This is at 20 foot of the reactor building. Those are the control units. There are no contaminated floor space. Remember, a roped off area in its basic sense is a barrier, a barrier to going in and checking and doing work.

MR. MICHELSON: Have you made any changes to that scram discharge volume right above those units?

MR. ANDERSON: That mod was done. It has worked fine.

MR. MICHELSON: It is a low radiation area now?

MR. ANDERSON: Yes, sir. This is an RHR heat exchanger.

I want to point out, you notice the blue piping. That's service water. One of the initiatives we take, mission statement, make it easier to do the right thing rather than the wrong thing, eliminate barriers. Contaminated areas are barriers.

We're color coding our pipes. So now you and I could walk through and when you enter a room you will be able to identify -- my goodness, there's water spilling out of the top of this valve. You and I are not licensed on the plant. But you can go to the room and see that a pale blue color is service water and you can make an intelligent

report to the control room that I was in the room number and there's a service water leak from vale number -- I mean, we can do that now.

Again, it is make it easier to spread that knowledge around.

[Slide.]

MR. ANDERSON: This is an RHR pump. Again, the green is -- this pale green, and unfortunately the colors aren't too good, there's a pale green color here. That's the color of the RHR system.

[Slide.]

MR. ANDERSON: This is my favorite. This is in the lowest part of the plant, the proverbial basement. This is the HPCI turbine. This is the high-pressure coolant injection, our high pressure safety system. I like to call it hospital clean and it is. It also happens -- by the way, both units happen to have excellent safety system reliability, not because we changed them, because we maintain them.

[Slide.]

MR. ANDERSON: This is the RCIC system and I have to read it. Reactor core isolation cooling. I wish they called it just the small HPCI, but we never did. This is not a safety system but again you can see color coded pipe. This is also in the lowest place in the plant.

This is the core spray room, as you can see. If you will, this is the side of a square building, that's the reactor building and you see the wall of the torus here kind of cutting, it's a triangular shape. But this is the core, this is the color of core spray. You see a leak from that and you know it's core spray, you have a question about it.

The position we took is if you can keep the basement clean, you can keep the rest of the plant clean So we started at the bottom and worked up, sometimes to the painters' chagrin.

There are not preservation issues.

This is the reactor building closed cooling water heat exchangers. This is 50 foot. So we were down to the minus -- what's the lowest level, John -- minus 17 feet below sea level. Now we are up to 50 feet above sea level. These are the heat exchangers. This is some of the piping I had mentioned earlier. This is, in essence, brackish water on one side of this heat exchanger and the pumps.

You can't see it, but we did some things to reduce the maintenance. We put in mechanical seals. These don't leak anymore. Nice, reliable mechanical. Not the old packing gland and two nuts to adjust.

[Slide.]

MR. ANDERSON: Again, another shot on the 50-foot level.

[Slide.]

MR. ANDERSON: This is an RHR service water booster pump and I think you can see some of the modifications we did to foundations. You'll notice this is one large stainless steel bed. There was a lot of corrosion here and anchor bolts were in the concrete.

The modifications we did were to make a complete new bed plate, do it once, do it stainless and we won't be there again. You can also see some of the new material piping. I guess this is a bad picture to do that. But some of the copper-nickel piping that we're putting in the service water system to reduce the amount of maintenance because that type of maintenance doesn't get you ahead in plant performance, it's an inhibitor to plant performance every time you fool with a leak.

MR. CARROLL: You're using copper-nickel up to what size?

MR. ANDERSON: I don't know. I have -- you're talking about -- well, I've seen copper nickel about up to 18 to 24 inches, John?

Most of the work right now is going on in the diesel generator building, getting rid of that carbon steel and getting in the copper-nickel.

MR. MICHELSON: How are you doing the bio fouling for the seawater side?

MR. ANDERSON: Chlorination.

MR. MICHELSON: Chlorination. Continuous or batch?

MR. ANDERSON: Pardon? Continuous.

MR. MICHELSON: And you don't have any more tube worms and all the other kinds of problems then?

MR. ANDERSON: I'm sorry?

MR. MICHELSON: You do not have any more of the bio fouling problems, tube worms, the clams and so forth, mussels?

MR. ANDERSON: I never say "never."

MR. MICHELSON: You did say that, yes. You're not presently having it?

MR. ANDERSON: That's correct. Right now the plan is that we will get copper-nickel in. If I had to make a split, those pieces of pipe that I cannot walk down, we'll put copper-nickel in. Those pieces that I can walk down, we walk down each outage and inspect.

[Slide.]

MR. ANDERSON: This is the hallway and you are leaving Unit Number --

MR. MICHELSON: You know, copper-nickel does have a history of having problems in alternately flowing and stagnant systems.

MR. ANDERSON: Yes, it does.

MR. MICHELSON: You've got to be careful of that. Condenser tubes, copper-nickel condenser tubes have had a lot of difficulty in that regard when units are shut down and returned to service.

MR. ANDERSON: It will be interesting to see. I put titanium service water piping in at Pilgrim and then when I saw the grounding mechanism I shook, and looked at the valance. Yes, sir, I am aware of that.

This is the hallway, if you will. You are entering Unit Number 1 from Unit Number 2. The reactor building is on this side and the valance or plant turbine building is on this side.

One of the missions, and it's very interesting to watch, but if you watch my employees now and it is very difficult to measure but it's intangibles, they smile now. When someone can go in in their street clothes and do a job and not come out dirty, when someone is proud to bring their family where they work, because one of the things we said is, I'd like everybody to bring their family and show them where they work.

I didn't bring any "before" pictures, but it was not a place you could be proud of. This is.

MR. CARROLL: What does it say on the stop sign. I couldn't read the small print.

MR. ANDERSON: It says, "Stop. You are in Unit 1.

Think."

We have unit number mission, right. Do an outage on one unit and not work on Unit Number 1 by mistake, Unit Number 2 is shut down. We have a program that's called STAR, stop, think, act, review what you did and it has been very effective.

[Slide.]

MR. ANDERSON: Now, I just wanted to show something. This happens to be Unit Number 2, this is the main feed pump. This is a room we opened up. It is normally a high radiation area during operations, behind shielded walls. This is after 312 days of continuous operation. If you do the maintenance correctly, if you take the time to preserve it, it stays that way. It does not become something that you have to go over and over again.

[Slide.]

MR. ANDERSON: This one, here's another shot of that same room. We just opened it up, so it was an opportunity to take a picture. Unit Number 2 is now down in a refueling.

[Slide.]

MR. ANDERSON: here are the feed condensate booster pumps in Unit Number 2. The shot doesn't show it well but one of the things we did is the floors in Unit Number 2 are blue and the floors in Unit Number 1 are white.

Again, we want to split the units, make it easy to do the right thing. You've got a blue piece of paper you're working on, work document, you're in Unit Number 2.

MR. MICHELSON: How do you do the train identification within the unit? Like RHR for instance.

MR. ANDERSON: It's identified by label.

MR. MICHELSON: But not by color?

MR. ANDERSON: No. The plant manager of Unit Number 1 says that it's unfair because his floors are white and harder to keep clean. I told him they're probably both just as hard to keep clean, one of them just shows it more.

[Slide.]

MR. ANDERSON: The diesel generator room.

[Slide.]

MR. ANDERSON: And this is the control room. And here is another area. I believe the work at Brunswick was more personnel related than hardware. We did a lot of hardware work, but whether it becomes a monument that's perfectly restored and changes from that point or whether it stays there and runs is the people that are there.

This is the control room. Our control room operators are in standard attire. They wear ties.

MR. MICHELSON: Would you flash your diesel generator compartment for just a moment?

[Slide.]

MR. ANDERSON: You are looking down, one of the Norberg diesels.

MR. MICHELSON: Down beside the wall.

MR. ANDERSON: Yes.

MR. LINDBLAD: Can you remember what the dimensions of that diesel generator room are? We had another issue yesterday on typical dimensions of a diesel generator room.

MR. ANDERSON: Oh --

MR. LINDBLAD: How tall is the ceiling for one?

MR. ANDERSON: 40 feet?

MR. LINDBLAD: Thank you, that's all I need.

MR. ANDERSON: It's a big room. If the question is enough room to do maintenance, which is usually when I walk into a space, we have the room.

[Slide.]

MR. ANDERSON: Standard attire. We are going to standard attire with our maintenance folks. If I said to you, it's like everyone here wears a tie, it's a sign of a professional, our operators responded to that.

MR. CARROLL: Ohhhhhhh --

MR. LINDBLAD: Keep going.

MR. ANDERSON: I stepped into it?

MR. WILKINS: You don't know why you lucked out, but we do.

[Laughter.]

MR. CARROLL: When you talk about standard attire for maintenance people, you are certainly not talking neckties, are you?

MR. ANDERSON: No, sir, but we are talking about standard -- for example, khaki or blue pants, cotton.

MR. CARROLL: Okay.

MR. ANDERSON: I'm talking about a collared shirt or almost a polo shirt in the summertime. I'm talking about a pair of coveralls with a company logo. It was always interesting, when I walk on a site I always look for something -- do company employees wear the company logo or do they wear the contractor's logo with all those jackets and coffee mugs and that stuff? I'd prefer my company logo.

MR. CARROLL: Now tell me about the operator in the control room. Does he take his tie off when he goes out in the plant? I don't need to see a picture.

MR. ANDERSON: No. No, he does not.

MR. CARROLL: Around rotating machinery he wears a tie?

MR. ANDERSON: You tuck your tie in. No, sir.

MR. CARROLL: Okay.

MR. LINDBLAD: While we have got you stopped for a minute, what is your replacement power cost?

MR. ANDERSON: My goodness -- I can tell you that

we spent, for the time Brunswick was down -- Skip? $50 million?

MR. CARROLL: You have got to get to a mike.

MR. ANDERSON: For the period that Brunswick was down we spent about $50 million in replacement costs.

MR. LINDBLAD: And that was from what kind of generation?

MR. ANDERSON: I don't know.

MR. LINDBLAD: And that is purely an estimate?

MR. ORSER: It was primarily coal-fired generation, mostly from AEP's power plants.

MR. LINDBLAD: Thank you.

MR. CARROLL: Skip Orser.

THE REPORTER: Thanks, I got that.

[Slide.]

MR. ANDERSON: When I said we invested in the facility, if you want to have a world-class maintenance outfit, you have to have world-class training facilities and that is what we are doing. I mean we'll have almost as much training facilities as a local community college when it comes down to it, but it pays off in the long haul.

MR. CARROLL: Back to neckties. Do the operators stationed out in the plant, what I'd call an Auxiliary Operator, also wear neckties?

MR. ANDERSON: No, sir. The reactor operators,

the senior control room operators, and the shift supervisors wear ties; the auxiliary operators have an oxford shirt or a polo shirt, depending, because it gets very hot in the summer.

MR. CARROLL: Company provided?

MR. ANDERSON: Yes, sir.

MR. CARROLL: Company laundered?

MR. ANDERSON: No, sir.

MR. CARROLL: Okay.

MR. ANDERSON: Just don't bring that up at my --

[Laughter.]

[Slide.]

MR. ANDERSON: The challenge for the future is to proceed with the mission, safe, reliable, economic, and environmentally-sound electricity. I think we have made great strides in the safe, reliable, environmentally-sound area. We need to make this unit economic if we are to survive, to do all three.

I think the things like work control, I think the things like training will make the difference. They have made the difference, but that will be our challenge.

It is also to instill in our people the need to always go out and find a better way to do business.

If I said to you at every plant, whether it is on the watch list or it's on the good guy list, there is

something that somebody does better than somebody else and something that somebody does not as well, and you have to go out and ferret those pieces out. It was a challenge for our people. When they first went out, they would come back and say we do that better than they do. I said that's not what I sent you for. I want to know what they do better than we did, and that was an education process, to go out and it has made a difference.

I think benchmarking is the best way to know how you are doing, targeting for upper quartile. As the quartile shifts, so do the targets.

I think we have to continue to ensure a strong succession plan for employees, both technical training, integrated plant training, and supervisory training, and again, expectations are pay for performance. The 401-K always do that, set the stretch.

I think that in 1993 the plant came a long way. You know, when you think about it, we started in 1993 with both units down. All our training programs came up for INPO accreditation. We had an operator requal exam and we sent all our people to supervisory training and all our programs were reaccredited and both units started up and have run well, and we passed license operator requal, as a matter of fact, did very well, so I think the plant is on its way.

If I leave with one statement, I think it's

Napoleon, if I get the quote correctly, that commented when someone said to him the brigade was no good, it wasn't performing well, and his comment back was there are no bad brigades -- there are only bad brigade commanders. I believe at Brunswick I got a very good staff down there and I think we have the programs in place and we are demonstrating that they work. That ends my presentation for today.

MR. CARROLL: Okay. Any questions of Mr. Anderson?

MR. DAVIS: I have a comment, Mr. Anderson. I happened to review the Brunswick PRA that was performed several years ago and as part of that I toured your plant. I wouldn't recognize it from these slides.

MR. ANDERSON: Thank you.

MR. DAVIS: You have done a remarkable job of improving at least the appearance of the plant.

MR. ANDERSON: Breaker to breaker, that's performance. No, I thank you very much but I would say that the -- let me turn this off here -- if you are proud of where you work, your work is better and I cannot quantify that but that's true.

MR. WILKINS: That is very true. People who work in a clean environment don't throw chewing gum on the floor and put their cigarette butts where they are supposed to.

They do a better job all around. There is no question about that.

MR. DAVIS: The only slight concern I have is if you emphasize on-line capacity as the performance index, there is a risk that you are going to run into some safety problems because, you know, in our perspective I think safety must come first and then performance follows.

If you get that reversed, there can be some problems. I have seen plants that were operating that were right on the edge of tech spec violations and probably shouldn't have been operating.

You understand what I am saying, I guess?

MR. ANDERSON: Absolutely, and I think that the issue there is, and I'll go back, is I'd love to have breaker-to-breaker runs, start-up from a refuelling run and shut down, but that is not the mission. If I maintain that plant well and every hundred days I have to take it off line to fix something for a week, I can still do 81 percent, I can still have a world record run, and that is the way we run the business and again I go back to the preservation in the plant.

People who spend a lot of time making it leak-tight don't want to see it run-down, and if we are to succeed in the future, that swell has to come from the bottom. It has to be the people that say, you know, we can

fix that, we need to fix that, we need to go down in power and go into the condenser, we just can't run this way.

MR. CARROLL: I guess I was curious as to what you have done in terms of a computer-based management information system that is used throughout the plant. Do you have such a thing?

MR. ANDERSON: Yes, I would like to unplug it.

MR. CARROLL: Why would you like to unplug it?

MR. ANDERSON: I'm being facetious. Yes, we do. We are integrating to one database. We have put a LANS system in to tie in all the buildings.

But fundamentally in the last year my push was to put the human back in. We had this gigantic database. It was a large uncharacterized listing of things that had to be done.

The mission -- take Unit Number 1, for example. There were 640 outstanding maintenance items that are of low priority. If I can get that number down low enough, I would like to keep it in a loose-leaf binder.

If I can get the number of procedure changes down low enough -- and I would argue there is a tendency towards worrying about managing the numbers instead of working on the numbers themselves. So, yes, we do. That's my opinion on that.

MR. CARROLL: Who put it together? Who put that

system together?

MR. ANDERSON: We did.

MR. CARROLL: But was it a bunch of computer jocks, or was it the maintenance people and the operating people?

MR. ANDERSON: Initially the basis of the system came from those people who understood computers. That is one of the differences -- getting back to that customer/supplier relationship that we have established, today the customer says, "This is a wonderful system. I can't use it."

It has been changing. So when I say as we integrate the LANS, it is the customer driving the screens, driving the information, driving the ability to change. I have been there before on that one.

MR. CARROLL: Okay.

MR. ANDERSON: Thank you.

MR. CARROLL: Any more questions?

[No response.]

MR. CARROLL: Okay. We appreciate your presentation. It was very interesting.

[Slide.]

MR. MILANO: I am going to end up with just a quick overview of what the NRC did to monitor the restart process for Brunswick Unit 2 in particular, and to follow on

with Unit 1.

Basically, the NRR and Region II entered into a task interface agreement which specifically defined which organization would do with regards to reviewing the activities that went on for the Brunswick restart. We established a Restart Review Panel. All of these actions were in accordance with the NRC Manual, Chapter 0350.

The Restart Action Plan, basically, had five major subsections in there, the major one being the physical readiness of the facility. Like I said before, the July 23rd letter, which provided the licensees' commitments for conducting a specific set of maintenance, became the central theme for the physical readiness portions.

Plant and corporate staff readiness. What that means is that we reviewed both the license operator, the training programs that went on. We also looked at those actions that were being conducted by CP&L to verify the readiness. They are system engineering walk-downs. They had their Nuclear Assessment Department do a detailed inspection and statusing of the readiness to restart. We monitored that.

Licensee management oversight. We looked at what they were going to be doing with regards to the return to power, their development of a power ascension program and their on-shift coverages and back-shift coverages.

There were several facility licensing actions that needed to be completed prior to the restart. Those were included.

Special inspections. Basically that centers around the major special inspection that was done by the staff. We conducted about a two-week operational readiness assist team inspection that was performed by NRR, or led by NRR, and having inspectors who were from other sites outside of the CP&L organizations.

[Slide.]

MR. MILANO: I am going to talk in particular just to what the Office of Nuclear Reactor Regulation did. We took the lead for developing the Restart Action Plan, putting it together, and getting it approved. Like I said, the first focus was the Unit 2 restart. NRR conducted a number of specific things and major evaluations that went on with that.

Emergency diesel generators. Like I told you, that was a major -- or a critical aspect of it. We look at the effects of one of the diesels had operated a -- a couple of cylinders had high exhaust temperatures. We looked at that and what the licensee had done in terms of verifying that the cylinder liner wasn't damaged.

We also reviewed a failure analysis report. The number 1 engine had sustained some damage, a couple of

cracked main bearings, some broken collision blocks and some gearing problems, a gearing and a flex drives that goes over to the lube oil pump.

MR. CARROLL: This brings up a question relevant to something that we have been talking about the last couple of days. Do you have an opinion, or does CP&L have an opinion to the effect that if I stock appropriate spare parts, there is virtually no diesel problem that can develop that I cannot recover from within 14 days?

MR. MILANO: I will turn that over to Mr. Anderson>

MR. ANDERSON: That has always and never written all over that question.

MR. CARROLL: Yes. I recognize that.

MR. ANDERSON: Let me answer it this way. I believe if you do the five-year overhauls on time. I believe if you keep up with the maintenance, those diesels are absolutely reliable. I have the spare parts to do that, so, yes, I guess, spare parts is a key.

MR. CARROLL: Including a short block?

MR. ANDERSON: No, sir. I don't believe you need a short block. You need cylinder sleeves. You need the five-year overhauls. If you identify you have a problem with a short block, I would expect you to have that occur on a five-year overhaul.

MR. DAVIS: What about the crank shaft?

MR. ANDERSON: No. The crank shaft in my opinion is not a consumable item. Bearings are. If you damage a crank shaft, I suggest that you have done something to that diesel. At least when I was younger and driving, it was always the case. It was never a wear-out problem.

These diesels are made with removable cylinder heads, removable liners, bearings that are replaceable, couplings, those types of items. If you check the bedplates regularly, if you do the non-destructive engineering on the casings to look for fatigue, all those things, you are either of capable of repairing in a timely fashion or catching before they do damage. I do not think it is necessary to have a crank shaft or short blocks in hot standby. My opinion is that I couldn't replace a short block in 14 days.

MR. CARROLL: I don't think so either. The issue is on the new evolutionary plants, what credit should be given for the combustion gas turbine as a replacement for a 1-E diesel generator? If you do give it credit, how many days can you use it for?

MR. ANDERSON: I am glad that is your question to answer and not mine.

MR. CARROLL: Well, it looks like we are progressing towards getting some reasonable credit but the

philosophy that the staff seems to have is that you should be able to turn anything around in 14 days.

MR. ANDERSON: I very, very strongly believe that if you maintain what you have and do the preventive maintenance, that most of that equipment in there is very reliable. Now you may decide that the preventive maintenance or the predictive maintenance is onerous and you should change, but to change because something is not reliable, I don't agree with that. You change because it is too much work to maintain it reliably and I think the diesels fall in that category.

MR. CARROLL: All right. thank you.

MR. MILANO: Continuing on, we looked at equipment corrosion problems. There was some corrosion in lower portions of the drywell. On the drywell liner we looked at the replacements that were being done with regard to the service water pump lube water system.

Overall, we spent a lot of time within the short-term structural integrity program, we looked at CP&L's contractor and put together some information. We went to Bechtel's organization and we looked at site walkdowns and we did a detailed review of their design guide that was done in the evaluation process.

MR. MICHELSON: Excuse me. What was the corrective action on the drywell?

MR. MILANO: On the drywell, what they ended up having to do is they ended up gouging out. It was an area where the concrete basemat went into the liner wall.

MR. ANDERSON: Do you want to me respond?

MR. MILANO: No. Let me continue. If I make a mistake, you can chime in. At that location, there was some water and corrosion and what they ended up doing is in areas they had to chip out the concrete and do weld repairs on the liner and then after they restored it, then they put flexible, RTV around the edge.

MR. MICHELSON: Was that liner resting on the concrete directly? Does your liner rest directly on concrete or is a sand-based or how?

MR. ANDERSON: No. Our containment is a reinforced concrete with a steel liner.

MR. MICHELSON: Oh, yours is reinforced. All right. You do not have these in the normal MARKs.

MR. ANDERSON: That is correct.

MR. MICHELSON: Yours is different, yes.

MR. MILANO: Based on the short-term structural integrity, at the end there were some actions that, because of lead times and materials and stuff like that, that couldn't be done. CP&L agreed to do an analysis of the combined effects of not making those corrections prior to the unit restart. NRR did a complete review of that

analysis.

Finally, like I mentioned before, we did an operational readiness assist team inspection and it was conducted or started on March 29, 1993 and it was done in accordance with one of the NRC manual chapters and the results came out okay.

MR. MICHELSON: I would like to ask one o[illegible] question. On the plant you have, since it is a salt [illegible] plant, are you using all fresh water for cooling the bearing coolers on the RHR pumps and things of that sort? Is that a fresh water cooling system that is safety grade?

MR. ANDERSON: We have a sea water system and an intermediate heat exchanger and the reactor building closed cooling water is fresh. It is fresh.

MR. MICHELSON: It is safety grade on your plant then?

MR. ANDERSON: Yes, sir.

MR. MICHELSON: All right. Good.

[Slide.]

MR. MILANO: Finally, Unit 2 returned to operation, the start-up was on April 29, 1993. On April 7, 1993 CP&L made the decision to, rather than to attempt to focus on starting Unit 1 which had a limited amount of fuel left -- I believe it was only about three or four months left of operation on it -- they decided rather than go to

the short return to ops that they would just conduct a refueling overall and Unit 1 was returned to operation in February of this year.

[Slide.]

MR. MILANO: Finally, for Unit 1 like I said before we added a number of requirements based on the Unit 2 restart to that restart action plan for Unit 1. Also, because of the core shroud cracks that were found, CP&L conducted a repair modification and also did an evaluation of the other cracks that were not repaired and NRR did a review of that evaluation.

This is probably a wrong choice of words, concerns, but there were other issues that were done prior to the restart. Both units have the hardened wetwell vents installed. The reactor vessel water level reference leg purge system was put in for the unit that just started up, Unit 2. Unit 1, the system is in there, it is just not hooked up yet and the jet pump holdown beams were replaced in Unit 1.

MR. CARROLL: On the level purge system, what design is that? Is that the Millstone design or the Millstone improved design?

MR. ANDERSON: Fundamentally, it is a reference leg fill coming off the control rod drive pumps. Yes, I believe that is what Millstone did.

MR. CARROLL: All right.

MR. MICHELSON: Is that a first-time replacement for the holdown beams?

MR. ANDERSON: That is correct, first-time replacement.

MR. MICHELSON: All right.

MR. ANDERSON: An was not made because of cracks. We did it as a pre cory strike based on the Grand Gulf experience.

MR. MICHELSON: But you hadn't really detected any problem with yours then, even before that?

MR. ANDERSON: That is correct.

MR. CARROLL: All right.

MR. MILANO: Now I am going to turn it over to Chris Christensen who was a part of the Region II personnel on the restart review panel.

MR. CARROLL: Chris, we are running a little short on time. One of the things people keep wanting to tell us is about all the chronology of letters back and forth and things like that. That is not really one of our major interests.

MR. CHRISTENSEN: Yes, sir. I have jumped my slide that starts with number 4 there.

MR. CARROLL: All right.

[Slide.]

MR. CHRISTENSEN: Good morning. My name is Chris Christensen and I am a section chief out of Region II, Reactor Projects. I am also the acting branch chief for right now and I would like to thank the committee for inviting me to talk about Region II's activities.

I am going to go ahead and skip a lot of the correspondence and stuff that went on early in the process and talk about what Region II did for the follow-up and Brunswick's recovery.

The NRC developed an oversight review panel which was established to review the start-up and recovery of Brunswick. That panel basically consisted of the Chairman, who was the deputy director of reactor projects, John Johnson. It had the NRR project directorate, NRR project manager, the division directors from each of the technical divisions in the region plus the branch chief, section chief and senior resident.

These meetings were basically conducted on a monthly basis and at each time we had a meeting, what we discussed was the status of the inspection activities that had been conducted at the site, what issues were still left to inspect, what additional other issues were new and evolving that we need to provide more resources for.

Also, we did these inspections basically at almost the same time, basically the week before we had the public

meetings with the licensee and those were about every six weeks also.

At these public meetings we would discuss with the licensee the status of their recovery, the problems they were having and that type of issue and these were open to the general public and we had quite a bit of public involvement in these meetings. The newspapers and local television stations also showed up for these meetings. So basically the recovery process was open to the public throughout the whole year or year-and-a-half process.

Basically from June of 1992 to April of 1993, the region conducted numerous inspections in the areas of deferred equipment maintenance. We looked at how they were deferring the maintenance or what equipment they were going to fix. We inspected that.

We inspected how they were repairing their equipment corrosion problems, looking at how they did their short-term structural integrity evaluations and repairs based on their evaluations, how they were handling their temporary conditions.

We did material condition walkdowns where we walked down certain areas of the plant after they walked them down. We also walked down selected systems in the plant to make sure that they were being adequately maintained.

Additionally, we watched the repairs on the diesels and also the testing of the diesels. All of that basically lasted until the start-up which was basically in April of 1993 for Unit 2.

For this April 1993 for this start-up power ascension, we developed a special inspection organization. Basically what it consisted of is the regional supervisor. He was in charge of the start-up power ascension. He had basically three additional regional or resident inspectors that we pulled in from other sites to provide around-the-clock coverage in the control room for the start-up.

The resident inspectors, the senior resident and the other resident inspectors, also assisted, plus they did the monitoring of Unit 1 while Unit 2 was being started up and the start-up for Unit 2 in April. We had a confirmation of action letter which we had to give our concurrence for the initial start-up and, during the start-up process, the power ascension went fairly well.

They had different plateaus, the 15 percent plateau, 35 percent plateau and finally the 100 percent where the licensee would assess their performance in each of those areas and then decide to go on and prior to their going on to the next plateau, they would receive the region's concurrence on that start-up and that concurrence would be based on what the on-site inspection team, how they

perceived the plant was operating during that time period.

[Slide.]

MR. CHRISTENSEN: The start-up of Unit 2 as I said went fairly smoothly. Some of the problems they had they addressed expeditiously and it basically was a very smooth, orderly start-up.

On the completion of the Unit 2 start-up, we shifted our attention to Unit 1 basically from May of 1993 to basically January of this year, we did similar inspections that we did on Unit 2.

MR. CARROLL: Chris, just a moment. I understand that Pat and his people have a meeting with the EDO at 11:00 and are going to have to leave so before you leave, I would like to thank you for a very good presentation.

MR. MILANO: Thank you.

MR. CARROLL: You may want to stick around and defend yourself because he is going to continue on.

MR. ANDERSON: I also have to go to the meeting.

MR. CARROLL: Oh, you are going.

MR. ANDERSON: Yes.

MR. CARROLL: Well, then we would like to thank you also, Mr. Anderson. Please continue.

MR. CHRISTENSEN: We did basically similar inspections. For Unit 1, there were some unique things that they had that we did inspections on like the repair of the

core shroud and we sent inspectors out to San Jose to watch the development of the repair method and watch how they did that, plus we had inspections of when they were assembling or doing the repair itself at the site and reviewing the records and watching the tensioning of bolts for the repair blocks and things like that.

Other inspections we did is the three-year plan which is Brunswick's long-range program and we have started doing inspections in that area, work control process which is a long-term corrective action process, to determine how if the plan has set higher standards for their people, we did inspections on that.

We have one other inspection scheduled in the June timeframe, and it has to do with corrective action programs. In November, we did a readiness assessment team inspection and this was to assess operations, work control process, engineering, their self-assessment capabilities and determine if Unit 1 was ready for restart.

That inspection indicated that though there were still some minor problems in the work control process, that it had improved quite a bit and that in operations, engineering, and their self-assessment capability, the plant was capable and ready to start-up in February.

During the start-up in February, we also had a start-up organization inspection and effort there. However,

this was not as detailed as the initial one for Unit 2. Basically, there we had the senior resident in charge of the start-up and inspection organization and he sent in an extra three inspectors either from the region or from other sites to do around-the-clock coverage.

We watched the start-up from basically initial criticality to 60 percent around-the-clock and after that we dropped back down to selected coverage where we watched the major activities of that start-up and that start-up went a lot more smoothly than the Unit 2 start-up because they took the lessons learned as Mr. Anderson said earlier and he did note that they did that.

Basically, and also we just finished or the SALP ended in December for fiscal 1993 and in operations they received a 1 and that was an improvement from the year before. They went from a 2 to a 1 to a superior performance in operations.

In maintenance, they improved from a category 3 to a 2 in maintenance for this period. Engineering remained the same at a 2 which is good performance and in plant support, they received a 1 or superior performance in plant support.

Overall, what we have seen is that the plant has been operating well, that the operators take more command and control of the plant, that there are still some minor

procedural problems where they fail to follow procedures here or there, but they are more aggressive in addressing those now.

Their self-assessment capability, they do a good job of identifying problems. The corrective action program has seen some improvements. One of the biggest improvements that they had in their corrective action program is now they require their own organizations to give them a response back within 30 days of what their corrective action is going to be, sort of like what they do with violations they receive from the NRC.

In the past, they never had that. They just say that you have all these deficiencies and they would walk away and they would never get fixed but now they basically have the same process as we do. They have a formal response on what their corrective action is going to be and when they are going to be doing those and that seems to be working for them a lot better.

That is about all I had to talk about unless there are any questions?

MR. CARROLL: What do you think of the SALP process as being someone who has been involved in both, I assume.

MR. CHRISTENSEN: Yes, sir. I think the new SALP process is better. That is my personal view, but I do think

it is better.

MR. CARROLL: In what respect?

MR. CHRISTENSEN: Basically, I think it gets the NRC senior management more involved than it used to.

MR. CARROLL: And that is good or bad?

MR. CHRISTENSEN: That is good. They should be.

MR. CARROLL: Why?

MR. CHRISTENSEN: Why? Well, they were involved before, but in the past the staff was writing the SALP for senior managers and it would end up that they would do a lot of wordsmithing on it and they would not, wordsmithing on the product, and in the new process, they are the ones responsible for writing the SALP and they take more interest in making sure they understand the issues a lot better than they used to, I believe.

MR. CARROLL: I think that sounds positive. What about the number of areas? Do you think that is an improvement?

MR. CHRISTENSEN: I believe it is. I think it is more representative of the plant. Combining plant support, combining all those sections in the plant support; I thought it was a good process.

MR. CARROLL: All right. Does anyone have any additional questions of Mr. Christensen?

[No response.]

MR. CARROLL: All right. We want to thank you, also, for your presentation.

MR. CHRISTENSEN: Thank you very much.

MR. CARROLL: Back to you, Mr. Chairman.

MR. WILKINS: I suspect that we ought to take a break and I also don't think we have any further need of the reporter.

[Whereupon, at 10:36 a.m., the reported portion of the meeting was concluded.]

REPORTER'S CERTIFICATE

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

NAME OF PROCEEDING: ACRS 408th Meeting

DOCKET NUMBER:

PLACE OF PROCEEDING: Bethesda, MD

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.

Marilynn Estep
Official Reporter
Ann Riley & Associates, Ltd.

PRESENTATION TO THE

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

RESTART OF THE BRUNSWICK STEAM ELECTRIC PLANT

UNITS 1 AND 2

APRIL 8, 1994

PATRICK MILANO, NRR

ROY A. ANDERSON, CP&L

HAROLD O. CHRISTENSEN, REGION II

BRUNSWICK STEAM ELECTRIC PLANT

BACKGROUND

- STRUCTURAL PROBLEMS - APRIL 21, 1992 SHUTDOWN
- HISTORICAL PROBLEMS
  - Overall performance decline noted in 1988 SALP
  - NRC Diagnostic Evaluation Team Inspection 1989
  - Brunswick Integrated Action Plan
  - Special Region II Inspections in early 1992

BRUNSWICK STEAM ELECTRIC PLANT

BACKGROUND

- JUNE 1992 - PLACED ON LIST OF PLANTS REQUIRING ADDITIONAL NRC ATTENTION
  - REPETITIVE WORK CONTROL FAILURES
  - PERSONNEL ERRORS
  - INEFFECTIVE MANAGEMENT OVERSIGHT
  - PLANT MATERIAL CONDITION
  - LACK OF ATTENTION TO DETAIL
  - WEAK SELF-ASSESSMENT PROGRAM

BRUNSWICK STEAM ELECTRIC PLANT

BACKGROUND

- CP&L IMPROVEMENT PLANS
  - REGIONAL ADMINISTRATOR LETTER OF JUNE 23, 1992
  - CP&L CORPORATE IMPROVEMENT PROGRAM - DEC 1992
  - CORPORATE IMPROVEMENT INITIATIVES - JULY 1992
  - BRUNSWICK THREE-YEAR PLAN - DECEMBER 1992
- CONFIRMATORY ACTION LETTER - DECEMBER 18, 1992

BRUNSWICK STEAM ELECTRIC PLANT

ROOT CAUSE IDENTIFICATION

KEY NRC ISSUES

- FAILURE TO SET HIGH STANDARDS FOR MATERIAL CONDITION
- FAILURE TO PROVIDE SUPPORT FOR IMPROVEMENT
- LACK OF CRITICAL SELF-ASSESSMENT

LICENSEE SELF-ASSESSMENT

BRUNSWICK STEAM ELECTRIC PLANT

BRUNSWICK RESTART ACTION PLAN

- TASK INTERFACE AGREEMENT - NRR AND R-II
- RESTART REVIEW PANEL
- NRC MANUAL CHAPTER 0350
- RESTART ACTION PLAN
  - Physical state of facility readiness
  - Plant and corporate staff readiness
  - Licensee management and oversight
  - Facility licensing actions
  - Special inspections

NRC OVERSIGHT OF BRUNSWICK RECOVERY

OFFICE OF NUCLEAR REACTOR REGULATION

- DEVELOPMENT OF RESTART ACTION PLAN

UNIT 2

- NRR EVALUATION OF MATERIAL DEFICIENCIES
  - EMERGENCY DIESEL GENERATORS
  - EQUIPMENT CORROSION
  - SHORT-TERM STRUCTURAL INTEGRITY (SEISMIC QUALIFICATION)
  - COMBINED EFFECTS ANALYSIS
- OPERATIONAL READINESS ASSESSMENT TEAM INSPECTION (MARCH 29, 1993)
  - NRC INSPECTION MANUAL, PROCEDURE 93806

BRUNSWICK STEAM ELECTRIC PLANT

UNIT 2 RETURN TO OPERATION - APRIL 29, 1993

DECISION TO CONDUCT UNIT 1 REFUELING - APRIL 7, 1993

UNIT 1 RETURN TO OPERATION - FEBRUARY 28, 1994

NRC OVERSIGHT OF BRUNSWICK RECOVERY

OFFICE OF NUCLEAR REACTOR REGULATION

UNIT 1

- UNIT 1 ADDITION INTO RESTART ACTION PLAN
- EVALUATION OF CORE SHROUD CRACKS AND MODIFICATION
- OTHER MATERIAL CONCERNS
  - HARDENED WETWELL VENT
  - REACTOR VESSEL WATER LEVEL REFERENCE LEG PURGE
  - JET PUMP HOLDDOWN BEAMS

ACRS BRIEFING APRIL 8, 1994

B. REGION II ACTIONS

1. SPECIAL INSPECTIONS:

SPECIAL INSPECTIONS WERE CONDUCTED BETWEEN FEBRUARY - MAY 1992, TO ASCERTAIN THE LEVEL OF BRUNSWICK'S PERFORMANCE AND THE CAUSES OF ANY PERFORMANCE DECLINE

2. OVERALL CONCLUSIONS OF PERFORMANCE (IR 92-12):

- NOTED DEGRADATION OF THE PLANT's MATERIAL CONDITION
- HIGH STANDARDS NOT SET
- THE LACK OF CRITICAL SELF-ASSESSMENT AND A FAILURE TO TAKE EFFECTIVE CORRECTIVE ACTIONS

3. REGIONAL REVIEWS:

- REGION II REGIONAL ADMINISTRATOR LETTER TO CP&L JUNE 23, 1992 - REQUESTING ACTION PLAN
- CP&L's RESPONSE OF JULY 23,1992
- CP&L CORPORATE IMPROVEMENT INITIATIVE NOVEMBER 30,1992
- BRUNSWICK THREE YEAR PLAN - DECEMBER 15, 1992
- REGION II ISSUES CONFIRMATION OF ACTION LETTER DECEMBER 18,1992

4. REGION II FOLLOW-UP ACTIVITIES:

- NRC OVERSIGHT REVIEW PANEL ESTABLISHED, WITH REVIEW MEETINGS APPROXIMATELY EVERY MONTH (REGION II/NRR STAFFS) (MC-0350)

- INSPECTIONS OF UNIT 2 SHORT-TERM/RESTART ACTIONS (6/92-4/93)

- MANAGEMENT MEETINGS APPROXIMATELY EVERY 6 WEEKS OPEN TO THE PUBLIC

- UNIT 2 RESTART/POWER ASCENSION INSPECTION (4/26 - 6/4/93)

- INSPECTIONS OF UNIT 1 SHORT-TERM/RESTART ACTIONS (5/93 - 1/94)

- THREE YEAR PLAN INSPECTION (8/16 - 20/93)

- UNIT 1 READINESS ASSESSMENT TEAM INSPECTION (12/6 - 15/93)

- UNIT 1 RESTART/POWER ASCENSION INSPECTION (1/24-2/24/94)

5. OVERALL:

   - SALP

Carolina Power & Light Company
Brunswick Nuclear Plant
Presented To The ACRS

April 8, 1994

CP&L

Brunswick Nuclear Power Plant

- Dual Unit Boiling Water Reactor (BWR IV)
  - Mark 1 Containment with Hardened Wetwell Vent
  - Engineer — UE&C
  - Constructor — Brown & Root
- Capacity
  - Dual Units — 790 MWe — 2436 MWth
- Operating License Issued
  - Unit 1 — 1976
  - Unit 2 — 1974

CP&L

1992 Shutdown

- April 21, 1992 - Shutdown of Both Units
  - Seismic Qualification Issues
- Performance Issues
  - Management
  - Programmatic

CP&L

Performance Issues

- Management
  - Standards
  - Leadership and Support
  - Critical Self-assessment

CP&L

Performance Issues (cont.)

- Programmatic
  - Maintenance Work Control
  - Material Conditions
  - Maintenance History

CP&L

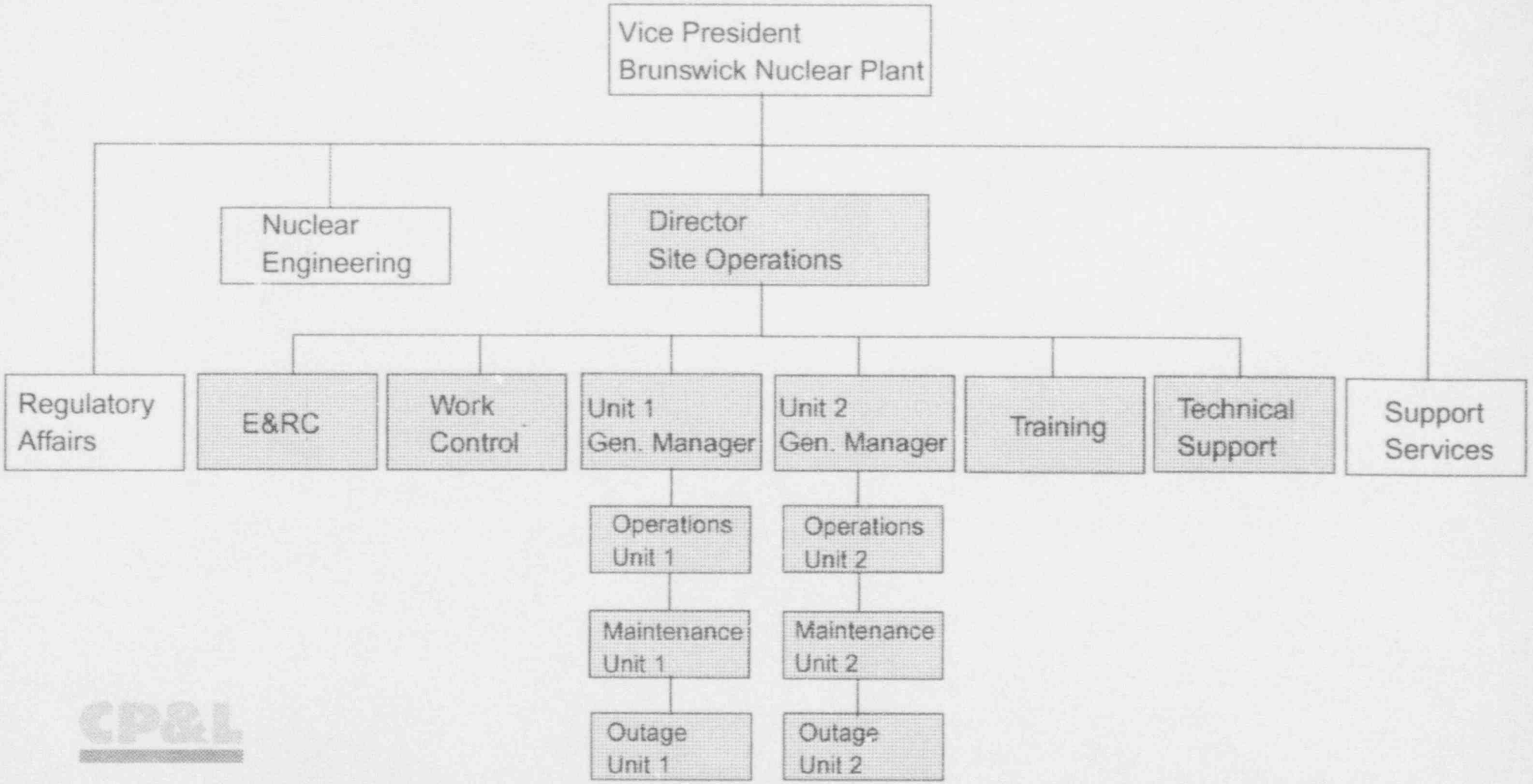
Fundamental Improvements

- Management
  - Clarity of Vision and Mission
  - Fresh Perspective
  - Unitized
  - Management Involvement
  - Set Standards
  - Personnel Ownership
  - Fortified Training
  - Results Oriented Plans

CP&L

Organization

Brunswick Nuclear Plant



CP&L

Fundamental Improvements (cont.)

- Programmatic
  - Self-assessment
  - Work Control Process
  - Effective Performance Management
  - Peer Group Interaction

CP&L

Results

- Culture Change
- Successful Dual Unit Management
  - Smooth Startups
  - Reliable Runs
  - Effective Outages
  - Reduced Backlogs
- Investment In People
- Improved Plant Material Conditions

CP&L

Focus On The Future

- Mission
- High Standards
- People
- Accountability

CP&L