

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

Title: BRIEFING ON STATUS OF BROWNS FERRY-2

Location: ROCKVILLE, MARYLAND

Date: JULY 19, 1989

Pages: 56 PAGES

NEAL R. GROSS AND CO., INC.

COURT REPORTERS AND TRANSCRIBERS
1323 Rhode Island Avenue, Northwest
Washington, D.C. 20005
(202) 234-4433

SECRETARIAT RECORD COPY

DISCLAIMER

This is an unofficial transcript of a meeting of the United States Nuclear Regulatory Commission held on July 19, 1989, in the Commission's office at One White Flint' North, Rockville, Maryland. The meeting was open to public attendance and observation. This transcript has not been reviewed, corrected or edited, and it may contain inaccuracies.

The transcript is intended solely for general informational purposes. As provided by 10 CFR 9.103, it is not part of the formal or informal record of decision of the matters discussed. Expressions of opinion in this transcript do not necessarily reflect final determination or beliefs. No pleading or other paper may be filed with the Commission in any proceeding as the result of, or addressed to, any statement or argument contained herein, except as the Commission may authorize.

NEAL R. GROSS
COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVENUE, N.W.
WASHINGTON, D.C. 20005

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

- - - -

BRIEFING ON STATUS OF BROWNS FERRY-2

- - - -

PUBLIC MEETING

Nuclear Regulatory Commission
One White Flint North
Rockville, Maryland

Wednesday, July 19, 1989

The Commission met in open session, pursuant to notice, at 2:30 p.m., Kenneth M. Carr, Chairman, presiding.

COMMISSIONERS PRESENT:

KENNETH M. CARR, Chairman of the Commission
THOMAS M. ROBERTS, Commissioner
KENNETH C. ROGERS, Commissioner
JAMES R. CURTISS, Commissioner

NEAL R. GROSS
COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVENUE, N.W.
WASHINGTON, D.C. 20005

STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

SAMUEL J. CHILK, Secretary

WILLIAM C. PARLER, General Counsel

OLIVER D. KINGSLEY, JR., Sr. V.P., TVA

OSWALD J. ZERINGUE, Site Director, Browns Ferry

HENRY WEBER, Engineering & Modifications Restart
Manager, TVA

DR. MARK O. MEDFORD, V.P. & Nuclear Director, TVA

RON SMITH, Project Engineer, Browns Ferry

GUY CAMPBELL, Plant Manager, Browns Ferry

JAMES TAYLOR, Deputy Executive Director for Operations

THOMAS MURLEY, Director, NRR

DAN CARPENTER, Senior Resident

DENNY CRUTCHFIELD, Associate Director for Special
Projects

JERRY GEARS, Senior PM for Browns Ferry

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

P-R-O-C-E-E-D-I-N-G-S

2:33 p.m.

CHAIRMAN CARR: Good afternoon, ladies and gentlemen.

The purpose of today's meeting is for the Tennessee Valley Authority and the NRC staff to brief the Commission on the status of Browns Ferry Unit 2 relative to its readiness to restart after a four year shutdown.

The Commission was last briefed on the subject of TVA organizational changes in Browns Ferry Plant status by TVA on June 21st, 1988.

Copies of the slide presentation and the related staff paper presented to the Commission for information, SECY-89-207, should be available at the entrance to the meeting room.

Do my fellow Commissioners have any opening comments?

COMMISSIONER ROBERTS: I have an irreverent comment, not about this meeting and this is sort of an inside joke, but I want to make sure all of my fellows have the necessary equipment to perform their job properly, at least as our principal Senate oversight committee sees it. That's a Mark I, Mod O matchbook.

COMMISSIONER ROGERS: So we can communicate

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 with each other.

2 CHAIRMAN CARR: And now we need a cup of
3 coffee, right?

4 Any other comments?

5 Mr. Kingsley, you may proceed.

6 MR. KINGSLEY: Thank you very much, Chairman
7 Carr.

8 I'd like to start today's meeting and
9 introduce the management team that we have at Browns
10 Ferry, starting with Ike Zeringue, who is the Site
11 Director, here on my left. He came to us as plant
12 manager from Palo Verde 3. Prior to that, he had all
13 technical support for all three units at the Palo
14 Verde Nuclear Power Plant. In addition to that, Ike
15 has been involved in some ten startups on a number of
16 different plants, BWRs and pressurized water reactors.

17 To Ike's left we have the Plant Manager, Guy
18 Campbell. Guy Campbell comes to us from Carolina
19 Power and Light. He was licensed on the boiling water
20 plant there, Brunswick Plant. After he left there, he
21 went to the Sharon Harris Plant where he was
22 maintenance superintendent, all the way through the
23 restart, joined us and was named Plant Manager last
24 summer.

25 We have Henry Weber. He came to us from

1 Bechtel. He's our Engineering and Modifications
2 Restart Manager, having principal responsibilities for
3 some of those activities at Palo Verde, Grand Gulf.
4 He's been involved in some ten startups in nuclear
5 power plants.

6 Ron Smith came to us from his own private
7 company. Previous to that he'd worked for Gilbert
8 Commonwealth, had been the project engineer for a
9 restart effort on Three Mile Island Unit 1 and carried
10 them through two refuelings, when they put in all the
11 extensive modifications on that unit.

12 And we have Doctor Mark Medford, who just
13 came to us. He's our Vice President and Nuclear
14 Technical Director from Southern California Edison,
15 having previous responsibility for their licensing and
16 regulatory affairs.

17 Behind me we have Bus Cobean, who is advisor
18 to the Board. We have Fred Moreadith, who is our Vice
19 President of Engineering, Pat Carrier who is the
20 Browns Ferry Licensing Manager; and Lawrence Martin,
21 who is the Manager of Quality Assurance.

22 I wanted to bring the team. All of us will
23 be happy to answer any questions that you might have
24 today.

25 COMMISSIONER ROBERTS: I want to make sure I

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 understand. All of these people you've just
2 introduced are employees of TVA?

3 MR. KINGSLEY: Every person, with the
4 exception of Mr. Cobean, who is advisor to the Board.
5 So, he would be a contractor. But everybody else is a
6 full-time employee of Tennessee Valley Authority.

7 COMMISSIONER ROBERTS: Thank you.

8 MR. KINGSLEY: (Slide) I'd like to go on
9 now to slide number 2 and talk a little bit about the
10 agenda. I'm going to talk about the recovery program
11 status. Ike Zeringue will talk about the site and how
12 we're doing. Henry Weber will talk about technical
13 issues and I'll do the summary and conclusions.

14 (Slide) Slide 3, the purpose of this visit
15 is, of course, to talk about the recovery program with
16 specific emphasis on the Unit 2 restart preparations.

17 (Slide) On Slide 4, I would like to have
18 just a little bit of history. You gave some of this,
19 Chairman Carr.

20 The Unit 2 was shut down for refuelling in
21 March of 1985. We filed the overall corporate
22 recovery program in March of 1986, followed that in
23 August of 1986 with Volume 3 of the Nuclear
24 Performance Plan. There have been a number of
25 meetings with the full Commission, principally for the

1 restart efforts on Sequoyah Units 1 and Unit 2. The
2 other milestone here that has changed since we've been
3 with you, in the past we have loaded fuel on the unit.

4 (Slide) Going on now to slide 5, I'm going
5 to cover five principal subjects. We're going to talk
6 about the organization, give you a progress update on
7 that. I'm going to talk specifically about what we're
8 doing about site management. I'm going to talk about
9 operations readiness, I'm going to talk about various
10 programs related to running a nuclear power program
11 and what we're doing about that. And last, I'm going
12 to talk about our project planning and scheduling.

13 Also, Mr. Zeringue and Mr. Weber will talk
14 about some of these subjects in some detail and be
15 prepared to answer your questions.

16 (Slide) Moving on now to specifically what
17 I'd like to address is our organizational progress.
18 When I came to TVA, there were a large number of
19 people in acting positions. Since that period of
20 time, we've had these people professionally evaluated.
21 We sat down as management and carefully reviewed them.
22 I'm now happy to report that at Browns Ferry we have
23 no principal individuals in acting positions. We do
24 have some approximately 20 at other sites in acting
25 positions, primarily at Watts Bar, but we're moving

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 out of that situation also.

2 When I got to TVA, we had five contract
3 managers filling TVA jobs. We have now replaced all
4 of those individuals and we have full-time TVA
5 employees filling those jobs.

6 There was a number of advisors over a period
7 of time that was used. I do not have any advisors. I
8 do have one individual who is looking at specific
9 technical problems for BWR Mark I containments, but I
10 do not have any advisors on my staff.

11 The last item on organizational progress
12 that I thought you would be interested in, since it's
13 tied directly in our ability to attract qualified
14 personnel and retain qualified personnel, is
15 compensation. We were able to put in an improved
16 compensation plan, with our Chairman's leadership, in
17 March and we have used that and will be using that in
18 the future.

19 (Slide) I'd like to move on now to slide
20 number 7 and talk a little bit more about our
21 organizational progress.

22 When I got to TVA and met with a number of
23 the people, it was very clear to me that I had to
24 stabilize the organization. So, what I did, I went in
25 and did a very careful review. We tried to do as much

1 of this from the bottom up as we possibly could. Out
2 of that came out what I call a standardized
3 organization and staffing plan. We have now put that
4 in place and we have communicated that to the
5 organization.

6 As far as site personnel at the Browns Ferry
7 Nuclear Power Plant, in January of 1989 we had
8 approximately 5800 people at that site. These are TVA
9 employees and their contractors. As of today, we have
10 approximately 3900 people. We have reduced that by
11 some 1700 people, 900 TVA employees and 800
12 contractors. It was simply too many people there for
13 us to effectively manage.

14 But I would also like to inform you and
15 state that in the announcements that we made back in
16 April of the long-term staffing goals, what we were
17 doing primarily at Sequoyah and in the corporate
18 support groups, that we excluded the Browns Ferry
19 Nuclear Power Plant from that so there would not be
20 perturbations in this restart effort of going through
21 a massive downsizing. The cuts that we made were
22 principally around the first of the year and in the
23 January time frame. So that's behind us there and we
24 are not asking Mr. Zeringue or the engineering people
25 to go through any type of downsizing until we get this

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 unit back on the line.

2 Another key factor in our recovery program
3 and what we've been trying to do with the organization
4 is to clearly define and increase the focus on
5 functional responsibilities. I've spent a lot of time
6 in doing this and I'm talking about what the engineers
7 do, what the modifications personnel do, what the
8 plant staff does and what those relationships are.
9 I'm going to talk a little bit more on some team
10 meetings and one-on-one meetings that I've had to
11 bring that about.

12 Another item that I found in standing back
13 and looking at the organization that needed some
14 improvement was this combination of engineering and
15 modifications. You might ask, "Well, why did you do
16 that?" I found the site director was principally
17 pushing engineering and pushing modifications and did
18 not have sufficient time to focus on the operational
19 side of the house. The key management for the
20 engineering and the modifications groups were located
21 in Knoxville.

22 So, I said, "We have to change this." So,
23 we came in, created a job and put Henry Weber in it.
24 We now have the engineering hard line to him as far as
25 budget cost and schedule. Mr. Moreadith is still

1 responsible for the technical integrity and technical
2 guidelines. So, we do not deviate across the TVA
3 plants for that. We put modifications there and now
4 this frees up Mr. Zeringue to of course focus on the
5 engineering and modifications, but to also spend the
6 time and attention on getting that plant ready to
7 operate, which we have to do and clearly demonstrate
8 to you before we come back and ask for permission to
9 restart.

10 COMMISSIONER ROGERS: Just before you leave
11 that, I wonder if it's possible for you to say just a
12 little bit about y our philosophy of organization, if
13 it was substantially different from what you acquired
14 when you showed up on site, and to what extent this
15 organization is one that has been put together to
16 address getting ready for operation as contrasted with
17 actually operating a plant once it comes on line.

18 MR. KINGSLEY: As far as from a site
19 director standpoint, I thought that there were too
20 many direct reports to the site director. There were
21 some dotted lines to the site director that we talked
22 about and what we've done with that. So we're moving
23 in to correct that so Mr. Zeringue does not have a
24 large number of reports.

25 As far as the plant staff, there were some

1 seven direct reports reporting to Mr. Campbell. That
2 being maintenance, modifications, technical, a support
3 group, a PORs group, chemistry and health physics. We
4 are moving with a standard model to reduce that.
5 We're creating an operations manager job. Maintenance
6 will stand by itself. The Radcon will stand by itself
7 and all of technical support. So we're going to be
8 putting that in. We're essentially there now at
9 Sequoyah. This is a much more classical organization
10 than what I've had at the Farley Plant and what we've
11 had at Grand Gulf and we're moving into that.

12 It also will add a good deal of depth within
13 the organization such that he's got backup people
14 there to be the on-call duty manager.

15 Classically, how you run these plants is you
16 have an on-call group, like the Op Superintendent.
17 They're the immediate interface with the main control
18 room and that type of thing. Then you have a higher
19 level of management that you have to put in place.

20 So, these are some of the things that I saw
21 that needed to be changed and we're in the process of
22 doing that.

23 (Slide) I'd like to move on now to slide 8
24 and talk to you a little bit about site management. A
25 principal job of mine is to get the right people with

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 the right attitude that have a proven record. I hope
2 to show you that we're doing that. We've spent hours
3 doing that. We've had these people professionally
4 evaluated, as I've talked, and it's vitally important
5 that we have this type people to do this.

6 We're emphasizing a very professional
7 approach, a no nonsense, very thorough, very complete
8 and it's the only way you can operate these plants and
9 we're pushing this. We're pushing this in a number of
10 programs that I'll show you as I get to that.

11 We very clearly define the expectations of
12 holding line management accountable, putting them in
13 charge and very carefully laying out what the support
14 functions are to do. Of course they're going to
15 assist us in setting policy, but primarily they're
16 going to exist to help these plants solve problems and
17 take that burden off of them for these longstanding or
18 long-term problems.

19 We've emphasized a lot of accountability. I
20 like to call it what I call the tennis management
21 syndrome effect, something that was very evident to me
22 in a number of areas and tennis management is where
23 the ball is in your court instead of, "I've got that
24 problem and I'm going to get it solved." So, we're
25 continuing to emphasize this and Mr. Zeringue has

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 helped immensely as we have moved to eliminate that
2 and create a better teamwork approach.

3 (Slide) I'd like to move on now to slide 9
4 and talk about operational readiness. I have held
5 individual, one-on-one meetings with all site
6 management -- I'm talking down under the plant manager
7 and the site director staff -- to emphasize my
8 philosophy. We've had a number of meetings that I
9 personally chaired where I make assignments, team
10 meetings, action plans and relationships and then we
11 come back and follow up on that to see if we get these
12 items complete.

13 We've established, since I've come aboard,
14 an operations improvement plan. It covers all primary
15 aspects of how you need to operate the plant, who's in
16 charge of the plant, various aspects of training the
17 people, logging, what have you.

18 We've activated the maintenance improvement
19 program. We had a maintenance improvement program,
20 but we had a very high turnover rate in the
21 maintenance superintendent position. So, it was
22 languishing.

23 We've established a system engineer
24 ownership of plant systems.

25 We have loaded fuel. Out of the load fuel

1 came a number of problems, as you well know. We're
2 quite embarrassed by the fact of not properly
3 monitoring the core, but we've used that as lessons
4 learned and there are a number of programmatic items
5 that came out of that.

6 We're treating INPO a lot more seriously.
7 As one manager told me, it was an occasional
8 acquaintance or relationship. I intend to make this a
9 love affair with INPO because you've got to go by
10 those criteria. You've got to treat it very
11 seriously. We're even tracking the responses to our
12 previous evaluation in our morning meeting that we
13 have.

14 We've completed our operational readiness
15 review, which was a commitment made in Volume 1 and
16 Volume 3. The team, which is essentially the group
17 that did Sequoyah, says we're ahead of where Sequoyah
18 was in 1987, but there's still a lot of work to do
19 there. We'll bring that team back in for a phase II
20 prior to coming back to you people and asking for
21 permission to restart.

22 (Slide) Moving on to slide number 10 here,
23 programmatic progress that we've made, we've changed
24 our incident investigation procedure and we now have
25 line management versus staff investigating events in

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 the plant.

2 We made significant improvement in our 50.59
3 safety assessment program, where we're now
4 implementing the NUMARC guidelines. We've put
5 additional training in for our people and we've
6 reduced the population of people who can do the safety
7 assessments.

8 We have formalized a number of vendor
9 interfaces, principally with General Electric Company,
10 where that tie had almost been broken there. General
11 Electric Company had essentially left the site, except
12 for a couple of people. I started bringing them back
13 in prior to fuel load. I just wish we'd have had a
14 good deal more active involvement on monitoring the
15 core, but they were actually riding the refueling
16 bridges when we loaded fuel there.

17 We've implemented a major upgrade in our
18 operating experience program. We're in the process of
19 re-reviewing all the General Electric service
20 information letters. We're still having to clean this
21 program up, but we now have people at the sites who
22 get this, get it right into line management so we act
23 on this vendor information.

24 (Slide) Moving on to slide 11, our
25 procedures program needed a great deal of work. We

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 have upgraded our technical review and validation of
2 procedures. Our original program, particularly in the
3 surveillance instructions and some of the operating
4 procedures was not working. We've increased the user
5 involvement in this upgrade process.

6 The last item here is what we call our
7 conditions adverse to quality where we document
8 problems in the plant. We are very aggressively
9 pursuing working out the backlog and promptly
10 resolving issues as they come up instead of having
11 them hang around for a period of a year, 16 months,
12 what have you.

13 (Slide) I'd like now to shift over to the
14 project planning and scheduling progress. We've made
15 significant progress in resolving major issues with
16 the NRC staff, which you have in your SECY paper. I
17 think we're there as far as the major technical
18 issues. Now we just have to produce.

19 We developed an integrated startup schedule.
20 We're monitoring this on a 60-day bases. We've also
21 established a milestone for condenser vacuum, which I
22 think is vitally important that we properly check out
23 the balance of plant on this system in addition to all
24 the primary systems and particularly on a boiling
25 water reactor.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 We are reviewing this schedule progress on a
2 weekly cycle. Of course there are daily meetings, but
3 I go down at least once a week where we go into the
4 schedule in depth. We've improved our contract
5 management, which has been a significant problem at
6 TVA. Mr. Weber will talk about that. We've improved
7 the definition of our task and we are now accepting
8 and holding contractors responsible for delivered
9 products.

10 This concludes what I have. I'd like to now
11 turn to Ike Zeringue, Site Director, and let him talk
12 more specifically about the site.

13 Ike?

14 MR. ZERINGUE: (Slide) Although there's a
15 large amount of physical work yet to be done at Browns
16 Ferry to prepare the unit for restart, our biggest
17 hurdle is to prepare ourselves and our employees to
18 operate the plant. To do this, we're going to have to
19 change our organizational culture. We're defensive,
20 we're often inattentive to detail, often protective of
21 our own old ways of doing business, somewhat resistant
22 to change, and shallow in our investigations and
23 evaluations.

24 To insure that we establish a safety
25 conscious culture, we're going to have to first

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 establish expectations, clearly defined expectations.
2 Specifically, management will have to insure that each
3 of us takes the time to do each task right each time
4 we do it, regardless of the impact on schedule or
5 capacity factor.

6 Secondly, we need to be fully prepared for
7 each task we undertake. That is, we need to
8 understand exactly what we're intending to do and its
9 impact on the plant, understand exactly how to do it,
10 know exactly what is expected to occur in the plant at
11 each step and be alert for any unusual response that
12 we're capable of mitigating it.

13 Most importantly, we need to become brutally
14 self-critical in all aspects of plant operation. We
15 need to thoroughly investigate and determine the root
16 cause of any component system failure, both NSSSI and
17 BOP.

18 We need to thoroughly evaluate and determine
19 the cause of all events or human errors, regardless of
20 the magnitude of that error.

21 Finally, management must continually
22 communicate and reinforce expectations through
23 detailed involvement in all plant activities.

24 If we can effectively accomplish this, the
25 employees at Browns Ferry will be both mentally and

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 emotionally ready to operate this facility in a safe,
2 efficient manner. That is indeed our biggest
3 challenge.

4 (Slide) I'd like to move to the next slide
5 and discuss some of the lessons learned from Sequoyah.

6 CHAIRMAN CARR: What percentage of the way
7 are you through that long list of things you've got to
8 do, would you say?

9 MR. ZERINGUE: I don't know, sir, if I can
10 weigh it on a percentage basis.

11 CHAIRMAN CARR: Have you started?

12 MR. ZERINGUE: Yes, we've started and
13 through our operational readiness review, it's clear
14 that the expectations have reached the people. Now, I
15 can't sit here and tell you that those expectations
16 are fully being carried out.

17 CHAIRMAN CARR: But --

18 MR. ZERINGUE: But at this point, they know
19 what is expected.

20 CHAIRMAN CARR: As I read you, this, in your
21 opinion, is the controlling path?

22 MR. ZERINGUE: Yes, sir.

23 CHAIRMAN CARR: Okay.

24 MR. ZERINGUE: In preparing ourselves for
25 operation, we're utilizing the lessons learned,

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 experience gained at Sequoyah. I'd like to briefly
2 touch on four areas, operations, work control, BOP
3 systems and incident investigations.

4 Our conduct of operations procedure is based
5 on a Sequoyah procedure, the lessons learned there and
6 INPO guidelines. As Sequoyah has done, we've provided
7 professionalism training to all our on-shift operators
8 and, as Oliver has just mentioned, we've had our first
9 phase of our operational readiness review by
10 essentially the same team and that will occur again in
11 the future.

12 In the work control area, we're utilizing an
13 integrated work schedule concept to insure that all
14 work activities and test activities identified prior
15 to taking the system out of service or maintenance are
16 tested. To support this concept, we now have system
17 evaluators whose function is to identify all work
18 items and evaluate the impact of that work item on the
19 plant and the particular system. Additionally, we've
20 instituted the position of shift work control manager.
21 That's to provide 24-hour coordination and management
22 overview of work activities in the plant.

23 CHAIRMAN CARR: Is he licensed? I mean has
24 he been licensed?

25 MR. ZERINGUE: Some of them have been

1 licensed, not all of them.

2 Oliver mentioned that it's our intent to
3 increase our emphasis on the BOP side of the plant.
4 In order to do this, we're maximizing the testing we
5 can do prior to restart on the secondary site. As an
6 example, our condenser vacuum evaluation and vacuum
7 pull.

8 We're instituting what we refer to as our
9 SPOC process. That's a system operability check list.
10 It establishes the engineering baseline for the
11 system, assures system integrity, verifying all
12 maintenance, modification and testing activities are
13 complete and it verifies the configuration of the
14 system and places that system under our configuration
15 control processes. We're doing this not only on the
16 NSSSI but on the BOP side as well.

17 The fourth area I'd like to discuss is
18 incident investigations and that goes back somewhat to
19 the culture we're trying to establish. We want to
20 initiate incident investigations at a very, very low
21 threshold, so we can stop problems when they're little
22 problems and prevent them from becoming big problems.
23 We're using clearly defined processes, accepted root
24 cause techniques as a part of this program.

25 The program also requires that the senior

1 management be notified of all events. That's V.P. and
2 Senior V.P. level. Additionally, line management is
3 assigned responsibility for the completion of these
4 event investigations, clearly to insure that they are
5 involved, they understand what occurs, and that action
6 is taken to prevent it from occurring again.
7 Essentially, the bases of the process is to insure
8 that we know what we're doing and we take action, put
9 programs in place that will prevent recurrence.

10 (Slide) I'd like to move on now to our
11 schedule overview. Over the past few months, we've
12 been evaluating the Browns Ferry restart schedule. We
13 developed what I'll refer to as a Level I milestone
14 schedule, very, very major events. From that we've
15 developed integrated Level II schedules for all major
16 activities. That's not simply engineering activities
17 such as equipment qualifications or seismic. It also
18 includes employee concerns, CAQR work-off -- that's
19 our corrective actions system -- and licensing
20 commitment. So, it's an all-encompassing process.

21 In doing so, we optimize our man loading.
22 We wanted to make sure that the man levels are such
23 that we can effectively manage the tasks that are
24 taking place there. We did not want the up and down
25 approach and a swing in people. We wanted a level of

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 manpower that was consistent and easily managed.

2 Additionally, all these tasks have been
3 logically tied together and we utilize these Level II
4 schedules to logically develop system return to
5 service schedules based on major plant milestones such
6 as condenser vacuum, dry well closure, integrated leak
7 rate testing. And again we're utilizing our SPOC
8 system as we return each system to service.

9 Now, this is an important aspect of our
10 schedule development in that we're transitioning at
11 this point from what I refer to as a bolt construction
12 engineering mode to a system return to service mode.
13 Clearly, bringing the systems back is how we're going
14 to have to bring the plant back.

15 Now, to support our system return to service
16 process, we're refining our site and master punchlist.
17 The punchlist is a listing of all open items on every
18 system. Essentially, it is a single place where you
19 can find out exactly what has to be done on a system
20 on an individual basis. The required completion dates
21 for various activities are again tied back to the
22 system, return to service dates and the major
23 milestones.

24 COMMISSIONER ROGERS: How many systems are
25 in that inventory?

1 MR. ZERINGUE: All systems, 66 systems.
2 We've reevaluated our scheduled management processes
3 to insure we provide adequate management overview of
4 what's taking place at the plant. During fuel load,
5 there was a lot of emphasis on preparing systems for
6 fuel load. As a result of that, a lot of the other
7 activities that were not associated with fuel load
8 dropped behind significantly.

9 We're doing, on a weekly basis, a review of
10 our Level II schedules to assist the progress in that
11 regard. The systems that are associated with the next
12 milestone, in this particular case condenser vacuum,
13 we're reviewing those on a daily basis to assist our
14 progress.

15 On a daily basis, we have a punchlist
16 meeting which utilizes our site master punchlist.
17 Essentially, what we do in this regard is look at
18 things that are coming due within the next 60-day
19 period. Are there material constraints? Are the
20 designs being issued on time? Those kinds of things.

21 Also, we're looking at bulk work-off rates.
22 For instance, we have X number of maintenance
23 activities that need to be completed prior to restart.
24 That will translate to so many maintenance activities
25 being done per week or per day. So, we're looking at

1 our bulk work-off rates to see if those work-off rates
2 are consistent with our schedule assumptions. By
3 doing so, this allows us to focus on the milestones
4 that are in front of us, but also gives us a good feel
5 for what else is happening with regard to our schedule
6 progress.

7 (Slide) Now, with regard to our present 60-
8 day schedule, we developed within that schedule a
9 condenser vacuum milestone. The condenser vacuum
10 milestone was intended to evaluate our maintenance
11 department's ability to complete work.

12 Now, please understand that these were not
13 schedules that any of us here dictated. The
14 activities were identified and the people responsible
15 for completing those activities told us how long it
16 would take for them to do it. So, this is not in any
17 way an imposed schedule.

18 Again, as part of the 60-day schedule cut,
19 we're attempting to evaluate not only the maintenance
20 area with regard to the 60-day schedule, but our
21 ability to communicate; our ability to produce designs
22 on time and our ability to complete modifications on
23 time; and truly, our ability to coordinate a large
24 amount of activity within the facility.

25 With regard to status on our condenser

1 vacuum milestone, the physical work activities are
2 within three days of the schedule. However, at the
3 last minute, after development of that 60-day
4 schedule, we elected to apply our SPOC process to all
5 BOP systems to insure that those systems were
6 functionally ready to support operation. That has
7 impacted our engineering resources and will delay
8 formal completion of the condenser vacuum milestone by
9 approximately three weeks. However, the plant will be
10 ready to pull vacuum within a few days of schedule and
11 we intend to initiate that task to evaluate system and
12 equipment performance, evaluate the adequacy of our
13 procedure and our operator performance.

14 We're now approximately half way through our
15 60-day schedule evaluation cut and critical path
16 activities in this regard are within two to three days
17 of the schedule. However, assessment of our Level II
18 major project schedules and our bulk work-off rates
19 indicates that we're falling behind in the design
20 area, particularly in electrical issues.

21 While that's disappointing from a schedule
22 adherence perspective, the evaluation process has been
23 successful in its readily identified areas that need
24 additional management attention and shows that our
25 schedule monitoring progress is effective.

1 Now, from a work completion perspective, we
2 have increased the output in the maintenance area 200
3 to 300 percent in the last two months and just as
4 significantly in the engineering area. Two months
5 ago, engineering was putting out three to five
6 modifications a week. Statistically now they're
7 putting out 3.1 a day.

8 So we're moving ahead. We're progressing.
9 We will have this facility ready for restart. Now,
10 clearly, there's a lot of work taking place and it's
11 incumbent upon us to insure that these work activities
12 are being effectively monitored. When we started our
13 60-day schedule push and our push to condenser vacuum,
14 we instituted shift coverage of the senior managers on
15 site. So, through this process, we will have senior
16 management shift coverage to insure that the
17 activities are taking place in a safe quality fashion.

18 I'd like to introduce Henry Weber now.

19 CHAIRMAN CARR: Before you do that, let me
20 ask you, is your condenser vacuum milestone inside the
21 60-day schedule status or outside?

22 MR. ZERINGUE: Inside.

23 CHAIRMAN CARR: Inside. So you pick one
24 milestone inside the 60-day status to shoot for?

25 MR. ZERINGUE: Yes, sir. We wanted to

1 establish a milestone that would allow us to bring
2 systems into service so we could evaluate that
3 process. We also wanted to assess how well we
4 identified the task completion times for the overall
5 60-day period.

6 CHAIRMAN CARR: I understand that. Now, is
7 this a first cut or have you had one milestone you've
8 already met inside of some 60-day or is this the first
9 time you've tried the system?

10 MR. ZERINGUE: This is the first time we've
11 tried the system.

12 CHAIRMAN CARR: Okay.

13 MR. WEBER: During the schedule review on
14 the overall schedule, we identified four major design
15 issues that were on the critical path and, in fact,
16 have been driving the critical path. We'll briefly
17 discuss the status of these major design issues and
18 then discuss the resolution of our engineering
19 performance problems.

20 In addition, I would like to address the
21 concerns that were expressed or raised in the June
22 staff presentation on status of operating plants in
23 which you were advised that the implementation
24 continues to be a major problem and factor at Browns
25 Ferry. I'll address that in regard to engineering and

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 modifications.

2 In that application, implementation, reality
3 covers discovery, the engineering design portion and
4 the implementation of the mod itself. I'll be giving
5 you status of what we've been doing in that area and
6 some of the progress we've made.

7 (Slide) On slide 19, you can see the
8 overview of our problems and we're RAD on these. We
9 are happy to state that we have reached basic
10 agreement with your staff on all of our design issues
11 and we have finished our discovery phase and we are
12 clearly into the implementation phase of the work
13 process.

14 (Slide) Next slide, please.

15 As we went through and evaluated the
16 schedule, we had basically five generic problems that
17 kept reoccurring that we could see within our issues
18 and what, in fact, was causing our problem. The first
19 one was a repeated underestimating of the scope. The
20 primary cause of this was the fact that we were still
21 in the discovery phase. We were trying to say we had
22 fixed scope and make schedules that reflected that
23 and, in reality, we did not have a fixed scope. Until
24 we finished the discovery phase, we were continually
25 identifying additional work and then having to factor

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 that in and that, in turn, keeps driving you.

2 With the finish of the discovery phase, we
3 have got a very clear picture, we feel, of the scope.
4 We have laid it out, we have scheduled it. We have
5 developed quite a bit of additional confidence in our
6 definition of scope with the return of a number of the
7 experienced engineers from Sequoyah into Browns Ferry.
8 What this meant is they were bringing back the
9 experience they learned on these issues in the restart
10 there. They have looked at the to go scope and are
11 pretty well in agreement that we have covered the
12 different areas and we have included that within our
13 work.

14 The second area is in the management of
15 contractors. It's not really in a commercial sense.
16 It is the fact that we had a large number of
17 contractors over the last few years being worked on
18 the different issues or the different tasks. It
19 caused a number of continuity problems in the fact
20 that we were overlapping some redundancy. The
21 confusion is you were trying to analyze the data.
22 That portion is behind us. Also behind us is the
23 discovery -- it's all the same issue.

24 The other portion we had in this area is the
25 fact that down at the engineer level there was a lack

1 of identity with the task the contractors were doing
2 themselves because most of this work was being
3 administered at an engineering supervisory level. We
4 have since taken and pushed this responsibility down
5 at the engineer level on the task. This, in turn, has
6 had the positive results we've wanted. The engineers
7 are now on a daily basis involved with the contractors
8 that are performing this work. They're reviewing the
9 work as it progresses, not waiting until the whole
10 product is done and then reviewing it and having
11 problems digesting it.

12 As we see problems in the product as it's
13 being developed, we resolve them on a very rapid
14 basis. We have eliminated a lot of the impacts we
15 were seeing in trying to perform the schedule by
16 waiting, sitting back and waiting for a total product
17 to be handed to us.

18 The next area is in what we've classified as
19 defense of our positions versus getting technical
20 resolution to the positions. I would have to say
21 we've had a history of spending a lot of time and
22 resources in trying to defend our positions on
23 different issues, running additional calcs, tests, et
24 cetera. The solution to that has been very simple and
25 very straightforward. We have worked hard to come to

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 agreement with the staff on the technical criteria,
2 taking that criteria and going and turning that into
3 work and getting on with it. I quit doing the pencil
4 whipping and I'm trying to make things disappear, go
5 solve the problems. Put the effort on solving the
6 problems.

7 The impact from doing a pencil whip is it
8 takes a long time to come down to what's the true work
9 you're going to have to go do on it. By resolving
10 that type of philosophy, we've come to very rapid
11 agreement. Define the scope, go perform the scope.

12 On the engineering management at site, we've
13 had over the last five years six project engineers.
14 It's been a combination of contract engineers versus
15 direct TVA engineers. We have now brought in, this
16 spring, Ron Smith. He's brought with him his
17 experience from TMI Unit 1, which really covered an
18 area we had. We had very good qualified nuclear
19 engineers previously. They had very little restart
20 experience. We were constantly trying to reinvent
21 wheels, learn what the wheels were. We have
22 eliminated that interface, that delay problem.

23 We've additionally brought down a number of
24 key supervisors on a permanent basis from Knoxville.
25 They are now assigned as Ron's discipline leads.

1 We've brought in a few additional direct higher
2 engineers from other areas that had previous restart
3 experience to supplement a staff. As a result of
4 this, Ron and his staff are able to do the problem
5 solving and the production work directly at the site.
6 It gives us very fast turnaround to resolutions of our
7 problems. He has full access to the corporate staff
8 in Knoxville and he can pull those people in as needed
9 to solve the problems. It took a large time delay out
10 of our ability to respond.

11 The last area is what I would classify as a
12 very typical problem at most any site I've ever been
13 involved with, and that was the engineering versus
14 construction, or we call them modification here. When
15 you have the two separate organizations, every problem
16 is a unique problem and every problem has two unique
17 solutions. We've solved it very easily when they
18 combined both organizations into one department. We
19 work our problems as a team. We come to team
20 solutions to the problems and we integrate into the
21 schedule a team effort to resolve the work. Taking
22 those interfaces away probably was the last major area
23 I could see out there where we had a built-in delay by
24 approaching it from two or more directions.

25 It also is allowed now with a much better

1 coordination with the plant staff, that they don't
2 have to negotiate with multi-entities when something
3 is going to be done. It's basically brought into the
4 plant as a total cradle to grave, from start of design
5 to the finish of implementation. It allows them much
6 better ability to schedule and to factor this into
7 when it will be worked at the plant.

8 With that, I'd like to return back to
9 Oliver.

10 MR. KINGSLEY: Thank you, Henry.

11 (Slide) I'd like to now shift to our last
12 slide and conclude, Chairman Carr, and talk to you
13 principally -- that's slide 22 -- talk to you
14 principally about three items that I feel like some of
15 this that we have to complete, some of it we're
16 partially there, what have you.

17 But the first item is our culture. Mr.
18 Zeringue talked about that. It is my personal
19 experience that it takes on the order of two years,
20 two to three years to get that culture where you can
21 actually restart and on the order of about five years
22 to take it from a very poor performer up to a
23 classical high performer.

24 As an example, Grand Gulf was just recently
25 rated as an INPO I. You can see where that plant was

1 back in 1984. I mention that because I had a great
2 deal of personal experience and invested a lot of my
3 life in bringing that plant up over there.

4 We're going to continue to set very high
5 expectations. We're going to have a total intolerance
6 for people who do not conform or perform. We're going
7 to emphasize a very thorough approach. We're going to
8 continue to work at strengthening our management team
9 that I've talked about in the question that Commission
10 Rogers asked about that. We should be able to add
11 some more quality management so that we can have the
12 appropriate management there and have a good
13 succession planning process so that we can carry
14 ourselves through and not be in extremis if we lose
15 one key manager at that site.

16 We want to continue to hold line management
17 responsible, emphasize the role of the support staffs.
18 With respect to the schedule, we're doing a very
19 careful evaluation of that, but we're going to base
20 our schedule on actual production.

21 The September date is an embarrassment to me
22 personally, that we have not produced. There are a
23 lot of reasons for that, in not completing discovery
24 and then in not basing a schedule on our actual
25 production. But we're not going to make that mistake

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 again. We will not announce a schedule until we've
2 done this evaluation. However, we expect to have it
3 complete in August and come up with a firm restart
4 date, one that we can make and actually have
5 confidence in.

6 Now, at this time, we'll be happy to answer
7 any questions that you might have.

8 CHAIRMAN CARR: Commissioner Roberts?
9 Commissioner Rogers?

10 COMMISSIONER ROGERS: Just a little bit on
11 the system engineer ownership plant systems. The 66
12 systems that you said that you had on your punchlist,
13 do they match up with the systems engineers? There's
14 a one-to-one relationship? How many systems does a
15 typical system engineer look at?

16 MR. CAMPBELL: A system engineer might have
17 anywhere from two to five systems. It depends on the
18 size and the complexity of a system. Say, for
19 example, the engineer that has the heat removal
20 system. That's such a large, complex system. That's
21 just too much for one person. I've actually got two.
22 But some of the other systems can be handled by one
23 engineer up to a maximum of five or six systems.

24 COMMISSIONER ROGERS: So these system
25 engineers are all identified now and they're all

1 plugged in? They're all in place and they're involved
2 with this refinement of the punchlist?

3 MR. CAMPBELL: All system engineers have
4 been identified. We are currently filling about two
5 or three positions from outside that will conclude the
6 complete staffing of the system engineering group.
7 But all the systems are presently covered.

8 COMMISSIONER ROGERS: And who do they report
9 to?

10 MR. CAMPBELL: They report to my tech
11 support manager.

12 COMMISSIONER ROGERS: Is he in charge of all
13 engineering as well?

14 MR. CAMPBELL: He is in charge of all the
15 technical support for the plant organization. He has
16 the systems engineers. He has the reactor
17 engineering, the STAs, the plant testing program, if
18 you will.

19 COMMISSIONER ROGERS: Good.

20 You mentioned your vendor interface, that
21 you've formalized that. Have you systematically gone
22 back to your major vendors and checked to see what
23 documents that they have sent you or thought they sent
24 you and that you have them?

25 MR. KINGSLEY: Yes, we have. That was one

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 of the major items that came out of the fuel load
2 event. In looking at that, there was a RAP cell that
3 came out of General Electric Company in around the
4 middle of December that, if properly acted upon, would
5 have, in my mind, prevented this unmonitoring of the
6 core that we had there.

7 As a result of that, and of course we didn't
8 actually get that cell until the day we started
9 loading the core, we've gone back to the major vendors
10 and requested this information, diesel manufacturers,
11 what have you. It's very difficult to get all of
12 that, from my past experience, but we have attempted
13 to do that and we put a very high-level manager in
14 charge of that program now.

15 COMMISSIONER ROGERS: A very elementary kind
16 of thing, but it's a place where there can easily be
17 miscommunications, if they think they sent you
18 something and you never got it or you don't have it in
19 your records.

20 MR. KINGSLEY: Well, we found this in this
21 process too, a secretary signing it out, going into
22 our corporate office. The plant manager wasn't even
23 copied on the report. So, there's been a lot of
24 straightening out to do there too in the
25 correspondence of that.

1 COMMISSIONER ROGERS: Good. Thank you.

2 CHAIRMAN CARR: Commissioner Curtiss?

3 COMMISSIONER CURTISS: I don't have any
4 questions. Thank you.

5 CHAIRMAN CARR: When I visited there last
6 was over a year ago now. One of the things that I
7 took note of was the backlog, which you've mentioned,
8 of maintenance items and the high rate of turnover of
9 personnel maintenance, which at that time was about 20
10 percent. How do they stand now?

11 MR. CAMPBELL: I can speak to backlog and
12 maintenance. Currently, for Unit 2 restart, there are
13 approximately 1700 work requests that are required.
14 The actual total Unit 2 in common is about 2300. To
15 compare you where we were, say, two months ago, those
16 numbers were in the 3500 range. So we have made a
17 marked difference in accomplishing work.

18 We expect to have, based on my previous
19 experience, about a 50 percent increase or influx of
20 work as we go through the restart process as classical
21 emergent work. You go test it, it breaks, you need to
22 go fix it, that kind of thing. So, I think that the
23 MR backlog and what we've done in improvement in our
24 work ethic and how we plan and stage and the
25 management team that we've put in place in maintenance

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 has had a significant effect on getting us started in
2 the right direction in maintenance from an MR backlog
3 point of view.

4 Speaking of organization, we have brought in
5 two gentlemen from outside TVA that are very
6 aggressive gentlemen, have got good qualifications.
7 We've supplemented that with one of my other
8 superintendent's direct reports. He's actually
9 formerly the Radcon manager but he has very high
10 integrity in terms of organization and management and
11 insuring follow-up. He's added a lot of stability to
12 how that organization is run as a business.

13 Other things that we plan on doing from an
14 organizational point of view in maintenance is
15 insuring that the first-line supervisor understands
16 clearly what his responsibilities and accountabilities
17 are. We've gone too long with letting things go.
18 It's time to say, "If you can't meet the expectations,
19 then we must remove you from your job and put you
20 someplace else where you can be of benefit," and we're
21 doing that process and we are making some changes at
22 the first and second line supervisors.

23 CHAIRMAN CARR: And how is the turnover
24 these days in the maintenance organization?

25 MR. CAMPBELL: Pretty good. I don't have

1 real percentages, but it's nowhere near the 20
2 percent. We've been pretty stable in the maintenance
3 organization now for, I guess, about the past six
4 months.

5 MR. KINGSLEY: The area that we had a
6 problem with was in the top job --

7 MR. CAMPBELL: Yes, sir.

8 MR. KINGSLEY: -- there where we had
9 extremely high turnover of some six jobs, some six
10 incumbents in that job. We think we have now
11 stabilized that. Very essential to the restart effort
12 to put that in place.

13 CHAIRMAN CARR: Well, I must say that we've
14 heard all the right words. As I told other people
15 what I'll tell you, the menu looks good but we've got
16 to see how the food is. It's a little bit of time
17 before you're going to get there. You're just
18 starting into this phase. So, we look forward to
19 monitoring your progress.

20 Unless there are any other questions --

21 COMMISSIONER ROGERS: Yes, just on this
22 adequacy of cable installation. Where does that
23 stand? Where are your examinations and inspections on
24 that?

25 MR. SMITH: With respect to ampacity of

1 cable operations or which aspect of it?

2 COMMISSIONER ROGERS: No, the cable
3 installation. Not the ampacity, but the cable
4 installation. The questions about whether there was
5 damage to the cable in pulling them in and so on.

6 MR. SMITH: The review has been completed at
7 Browns Ferry. There has been modifications issued to
8 correct the deficiencies, similar to what was done in
9 Sequoyah. We have long cable drops and radius side
10 wall tension pressures and things like that. We've
11 gone through and high phonic cables and we have not
12 identified any major technical problems in that area.

13 COMMISSIONER ROGERS: Did the use of that
14 flamastic material interfere in any way with verifying
15 the installation adequacy?

16 MR. SMITH: I don't really know how to
17 answer that question. The cable trays, where they are
18 flamastic, are totally inaccessible. You cannot view
19 the cable. All you can do is -- where it comes out of
20 that tray into the device would lay by the component.
21 There is no way to physically inspect that cable and
22 that tray.

23 COMMISSIONER ROGERS: Well, is there any
24 possibility of concerns with respect to installation
25 of those cables that are buried in flamastic?

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 MR. SMITH: I'd have to go back and get the
2 technical --

3 MR. KINGSLEY: If you want to go ahead and
4 talk about it.

5 MR. ZERINGUE: We've spent a large effort in
6 verifying, not simply by walkdown, into the tray, out
7 of the tray. Also with cable tracing techniques,
8 where you can physically trace the location of the
9 cable. So, there's been a rather large effort in that
10 regard to establish the validity of the cable runs.

11 MR. KINGSLEY: We're also talking a
12 difference here between the trays which the cable is
13 traditionally laid in there and not pull versus what
14 you do through conduit or condolet. So, it is not a
15 flamastic problem in my opinion.

16 COMMISSIONER ROGERS: But they're separate.
17 The areas where there might be a concern with respect
18 to installation are not in the tray areas that are
19 buried in flamastic? Is that what you're saying?

20 MR. KINGSLEY: That's my understanding on
21 the pulls. We could ask a member of the staff to talk
22 about that.

23 COMMISSIONER ROGERS: I'd like to hear on
24 that one because that's been an issue and that's one
25 question that bothered me a bit when I was down there.

1 MR. KINGSLEY: Yes, there are now a number
2 of questions about over-pulling, over-stressing and
3 that type.

4 COMMISSIONER ROGERS: Whether there are any
5 areas where the flamastic has covered your ability to
6 inspect those cables, that might possibly have been
7 subject to an installation damage.

8 MR. ZERINGUE: Well, clearly, as Ron said,
9 once the tray is covered with the flamastic, the cable
10 is essentially inaccessible. The only way to try to
11 follow it is to pass a signal through the cable and
12 try to trace the signal.

13 COMMISSIONER ROGERS: I guess I don't know
14 what the answer is then.

15 MR. SMITH: I don't have a fully adequate
16 technical answer for you at this time. I'd have to go
17 back and ask the question --

18 COMMISSIONER ROGERS: I'd be interested if
19 you could just be specific on that one, whether you
20 can separate those areas where there might be possible
21 evidence of cable pulling problems from those areas
22 where the cables are inaccessible because of the
23 flamastic, to give us some comfort on that.

24 MR. SMITH: Thank you.

25 MR. KINGSLEY: We'll provide it.

1 CHAIRMAN CARR: Do you want to provide that
2 for the record then?

3 MR. KINGSLEY: We'll provide that for the
4 record.

5 CHAIRMAN CARR: Okay. Thank you very much.
6 We appreciate it.

7 I guess we can assemble the staff.

8 Mr. Taylor, do you want to introduce your
9 people and proceed?

10 MR. TAYLOR: Yes, sir.

11 Good afternoon. With me at the table, with
12 Tom Murley on my right, to the right of Tom is Dan
13 Carpenter, who's a Senior Resident. On my left is
14 Denny Crutchfield, the Associate Director for Special
15 Projects and the Senior PM for Browns Ferry, Jerry
16 Gears.

17 I would like to start by noting that I was
18 at Browns Ferry in May of this year. I toured the
19 unit and then met with some of the key management in
20 the afternoon to talk about a number of the technical
21 issues that they outlined. In a general sense, I was
22 heartened by that discussion with management there. I
23 detected an attitude of facing the issues that the
24 staff had, taking the responsibility to make the
25 appropriate decisions and, to borrow a word from Mr.

1 Weber, sort of no more of this pencil whipping, but
2 get on with the job. The plant and the attitude of
3 people I talked to in the plant was good. I talked to
4 a number of people as I walked through.

5 I do believe that the unit is reflecting
6 that and the solutions to the problems that are ahead,
7 the equipment problems, the technical problems are yet
8 to be resolved, which the staff will talk about. But
9 I did detect this strong sense of responsibility to
10 get these issues solved.

11 I'll now turn the detailed briefing over to
12 Mr. Crutchfield.

13 MR. CRUTCHFIELD: You've heard essentially
14 the status from TVA as to what's going on at Browns
15 Ferry. You've received our Commission paper, 89-207,
16 which lays out pretty well the status of the technical
17 issues as we see it.

18 There's one item in the table, I believe,
19 that has moved over from a difficult category to an
20 easier category for us, and that's the cable ampacity
21 question. We've recently reached an agreement where
22 that item now moves over to probably into Column A, at
23 the worst. More likely into that column than any
24 other column. So, that's the most difficult issue
25 that we saw that was remaining for us from a

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 programmatic standpoint.

2 As indicated generally, the other
3 programmatic issues, we're in basic agreement with
4 them and we're just working out some of the minor
5 details.

6 The management situation at TVA as we see
7 it, and as at Browns Ferry, is that we've indicated
8 generally that corporate TVA management, we're
9 satisfied with. They've made a number of changes
10 there. We made some approvals relative to the restart
11 of Sequoyah, so we're generally satisfied with the
12 corporate activities. They've made a number of
13 changes at Browns Ferry site to improve the management
14 activity that they have there. We believe we begin to
15 see that it's having an impact on Browns Ferry and
16 that they're turning around. The culture is beginning
17 to turn.

18 We still see pockets of old TVA that the
19 managers there are working on and I think are bringing
20 about progress. But it will take some time.

21 As I indicated, the programmatic issues, as
22 far as we're concerned, are generally pretty well
23 resolved. Periodically in their discovery phase or
24 their implementation phase, we see an issue that comes
25 up where we discuss it with them.

1 Recently we went through a couple of EQ
2 issues on motor control centers and some beta doses to
3 cables in the dry well. I think those issues are
4 being addressed and resolved to our satisfaction at
5 this time.

6 As indicated also, implementation remains to
7 be the major item that's necessary to be done. It is
8 having an impact on us in that we would previously
9 schedule an inspection activity for a particular time
10 frame. We have had to put off a number of those
11 inspection activities because TVA wasn't ready for us.
12 What we've done is highlight now some prerequisites
13 that we wish to see before we go down there so that
14 TVA knows where they need to be before we'll come down
15 and do our inspection. This saves both of us a lot of
16 resources and a lot of time, a lot of problems.

17 Potential restart impact issues are the
18 seismic program. They do need to get on with the
19 implementation. They have a great deal of work in
20 front of them. They have begun it as was indicated.
21 The engineering progression of work packages has
22 substantially improved over the past few months. They
23 need to continue that sort of activity so that they
24 can make a reasonable schedule for themselves.

25 EQ questions are still outstanding. I don't

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 think that the problems are more hardware problems. I
2 think the indications are that they need to get their
3 paperwork together. They need to get their binders in
4 shape so we can go down and take a look and make sure
5 we feel comfortable with what's going on.

6 The cable installation question that was
7 raised deals principally with our experience at
8 Sequoyah where there was a lot of silicone rubber
9 cable. They don't have that at Browns Ferry.
10 However, we're still concerned and we want to be sure
11 that sidewalk pressures, et cetera, do not get to the
12 position and the point where there is a problem.

13 The installation of a great deal of
14 flamastic down there has certainly made their job of
15 checking out cables, doing cable runs and things like
16 that much more difficult. They have been doing some
17 signal tracing, however, and that helps identify what
18 cables are in what trays and that sort of thing. So,
19 there's been some positive steps there too.

20 As I indicated, the ampacity question has
21 been resolved. We concluded that the consultant that
22 we were using was taking a very conservative approach
23 to the issue. We are less conservative. TVA is
24 somewhat less conservative than our consultant, but
25 yet we still feel there's reasonable margins there and

1 we're satisfied with the approach.

2 The inspection program, as I indicated, is
3 tied to prerequisites. We do have an operational
4 readiness team inspection that will be going down
5 there also. One of the reasons we permitted reload
6 was to encourage them to get back into an operational
7 mentality. When they reloaded the core, that put
8 certain tech specs in effect, so they're now minding
9 their LCOs and doing their surveillances in accordance
10 with those tech specs. So, we hope that smooths the
11 transition to a full operating plant for them.

12 As I indicated, we will be going down with
13 an operational readiness team inspection shortly,
14 within the fall or so.

15 With that, unless there are any other
16 questions that you may have, that's all the
17 presentation that I hope to make.

18 CHAIRMAN CARR: Commissioner Roberts?

19 COMMISSIONER CURTISS: Just a quick question
20 on the ampacity issue. In the attachment to the
21 paper, you indicated that TVA was proposing credit for
22 load diversity and time diversity. Is it on that
23 point that Sandia was being overly conservative?

24 MR. CRUTCHFIELD: Sandia's basic approach
25 was to assume that the cables were in the minimum

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 surface area that you can. In other words, confined
2 to a circular arrangement. TVA has persuaded us that
3 in the actual physical plant they are not located that
4 way. They're spread out throughout the cable tray.
5 So, once you take that into account, the effects are a
6 lot less severe on the ampacity question.

7 COMMISSIONER CURTISS: That's all I have.

8 CHAIRMAN CARR: The asterisks on the
9 significant issue list there that says "inspection
10 still necessary," is it your intention to complete all
11 those inspections prior to restart?

12 MR. CRUTCHFIELD: Yes, sir, it is.

13 CHAIRMAN CARR: I notice they've requested a
14 delay of the maintenance inspection. Have you got a
15 reschedule on that or are we waiting for their -- have
16 you got a milestone you're looking for them to pass
17 before you go down there?

18 MR. CRUTCHFIELD: We are waiting for them to
19 say that they're ready for us to come down and do the
20 inspection.

21 CHAIRMAN CARR: So, really, the ball is in
22 their court as to the tennis game went?

23 MR. CRUTCHFIELD: Yes, sir, tennis
24 management.

25 COMMISSIONER ROBERTS: That's a new buzz

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 phase. I've learned a lot of them in the past few
2 years.

3 CHAIRMAN CARR: We're not trying to shift
4 the responsibility, but the ball is clearly in their
5 court.

6 MR. TAYLOR: We have our eye on it, but it
7 happens to be on their side.

8 CHAIRMAN CARR: Okay. How about giving me
9 an assessment of post restart operations at Sequoyah?

10 MR. CRUTCHFIELD: To date, what we've seen
11 at Sequoyah is a willingness to learn from their
12 problems. We had some restart questions that they had
13 with aux feedwater. When they initially restarted
14 Sequoyah Unit 2 they had a number of trips. They
15 applied some resources to it and they got themselves
16 back in operation. They started Unit 1 up. They did
17 it relatively successfully. They had a transformer
18 problem, but they fixed that. They ran, I believe, on
19 the order of 200 days or so.

20 During the refueling outage that Sequoyah
21 Unit 2 had this past spring, performance was very
22 acceptable. They did it, I think, very well. Again,
23 when they came out from that outage, they had some
24 feedwater trip problems. Mr. Kingsley stopped all
25 activities. He called in some support from other

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 facilities, other utilities and got to what he thinks
2 is the root cause of the problem. We agree with him.
3 We think he has gotten to the root cause of the
4 problem.

5 It's a more measured approach on their part
6 to restart. It's not a drive to hurry up, let's get
7 the plant up and running, but it seems more considered
8 and a more refined process.

9 So, I would have to assess that I think the
10 restart activities and operations at Sequoyah have
11 been average to above average. We gave them a SALP
12 this past spring and it was all category 2s with some
13 improving trends. They did have one category 3 in the
14 engineering area, but that had an improving trend.

15 CHAIRMAN CARR: And you think Browns Ferry
16 has learned from Sequoyah's problems?

17 MR. CRUTCHFIELD: We're beginning to see the
18 transfer of experience from Sequoyah to Browns Ferry.
19 EQ people are coming over from Sequoyah. It's a one
20 time item, if you will. Once you get yourself
21 together, you can maintain it a lot easier. So,
22 they're bringing the expertise to Browns Ferry to
23 apply there. So, the iterations that we had with TVA
24 at Sequoyah, we probably won't have to have in as much
25 detail at Browns Ferry.

1 CHAIRMAN CARR: Are you keeping an eye on
2 the expertise that's left at Sequoyah so we don't get
3 sandbagged from behind?

4 MR. CRUTCHFIELD: Yes, sir, we are. That's
5 why I gave you the example of the EQ expertise. Once
6 you get a decent program established, and the effort
7 and resources it took to establish that program, then
8 you can transfer a lot of that experience and
9 individuals over to the next plant and yet maintain
10 some experience and knowledge at the existing site.

11 COMMISSIONER CURTISS: On that point, it
12 looks like they lost a good plant manager down there
13 at Sequoyah. Have they filled that slot yet?

14 MR. CRUTCHFIELD: No, they haven't. They're
15 actively pursuing both a plant manager for that site
16 and for Watts Bar also.

17 CHAIRMAN CARR: Obviously, good plant
18 managers are hard to hang onto these days.

19 MR. CRUTCHFIELD: Yes, they are, a difficult
20 commodity to get.

21 CHAIRMAN CARR: What is the -- when do you
22 intend to do another -- or set the SALP schedule up
23 for Browns Ferry again?

24 MR. CRUTCHFIELD: The SALP began with the
25 refueling activities that occurred in January. Now,

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVENUE, N.W.

WASHINGTON, D.C. 20005

1 we told them that that's when the SALP period began.
2 We haven't established when it will end, but it will
3 be in time so that we can -- before we brief the
4 Commission on restart activities, we will have
5 completed a SALP period.

6 CHAIRMAN CARR: Okay. Any other questions?

7 Well, I'd like to thank both the Tennessee
8 Valley Authority and the staff for the briefing. We
9 needed the update on the situation down at Browns
10 Ferry. A four year shutdown is certainly a long time
11 to be shut down. It's a tough problem to get back on
12 the line. I know TVA would like it back on the line
13 probably more than anybody else.

14 They have shown their ability to do it once
15 at Sequoyah. They've got both those plants on the
16 line and, as you've heard, they seem to be running
17 reasonably well. So, they've demonstrated they can do
18 it. Certainly, as I said, the words we've heard here
19 today are encouraging. They've taken a lot of
20 corrective action and put a lot of attention on the
21 plant. We'll be watching their progress intently.

22 Unless there are other concerns, why, we'll
23 adjourn.

24 (Whereupon, at 3:42 p.m., the briefing was
25 concluded.)

CERTIFICATE OF TRANSCRIBER

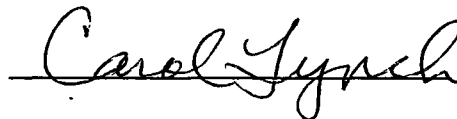
This is to certify that the attached events of a meeting
of the United States Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING ON STATUS OF BROWNS FERRY-2

PLACE OF MEETING: ROCKVILLE, MARYLAND

DATE OF MEETING: JULY 19, 1989

were transcribed by me. I further certify that said transcription
is accurate and complete, to the best of my ability, and that the
transcript is a true and accurate record of the foregoing events.



Reporter's name: Peter Lynch

NEAL R. GROSS
COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVENUE, N.W.
WASHINGTON, D.C. 20005

7/19/89
SCHEDULING NOTES

TITLE: BRIEFING ON STATUS OF BROWNS FERRY-2

SCHEDULED: 2:30 P.M., WEDNESDAY, JULY 19, 1989 (OPEN)

DURATION: APPROX 1-1/2 HRS

PARTICIPANTS: LICENSEE (TENNESSEE VALLEY AUTHORITY)

45 MINS

- OLIVER D. KINGSLEY, JR.
SENIOR VICE PRESIDENT, NUCLEAR POWER

MANAGEMENT
ASSESSMENT

- OSWALD (IKE) J. ZERINGUE
SITE DIRECTOR, BROWNS FERRY NUCLEAR PLANT

SITE OVERVIEW
PLANT STATUS

- HENRY WEBER
ENGINEERING AND MODIFICATIONS
RESTART MANAGER

TECHNICAL
ISSUES

- DR. MARK O. MEDFORD
VICE PRESIDENT AND
NUCLEAR TECHNICAL DIRECTOR

- RON SMITH, PROJECT ENGINEER
BROWNS FERRY NUCLEAR PLANT

- GUY CAMPBELL, PLANT MANAGER
BROWNS FERRY NUCLEAR PLANT

*- FRED L. MOREADITH, VICE PRESIDENT
NUCLEAR ENGINEERING

*- NICHOLAS C. KAZANAS, VICE PRESIDENT
NUCLEAR ASSURANCES AND SERVICES

NRC

15 MINS

- VICTOR STELLO, EDO
- THOMAS E. MURLEY, DIRECTOR, NRR
- DENNIS M. CRUTCHFIELD, NRR

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT
UNIT 2

NRC COMMISSION MEETING
JULY 19, 1989
Rockville, Maryland

BROWNS FERRY NUCLEAR PLANT

AGENDA

RECOVERY PROGRAM STATUS - O. D. KINGSLEY

SITE OVERVIEW - O. J. ZERINGUE

TECHNICAL ISSUES - H. WEBER

SUMMARY AND CONCLUSIONS - O. D. KINGSLEY

PURPOSE

- **REVIEW OF RECOVERY PROGRAM**
- **STATUS OF UNIT 2 RESTART PREPARATIONS**

BACKGROUND TVA NUCLEAR RECOVERY PROGRAM

MARCH 1985	UNIT 2 SHUT DOWN FOR REFUELING OUTAGE
AUGUST 1985	ALL TVA NUCLEAR PLANTS SHUT DOWN
SEPTEMBER 1985	NRC ISSUED 50.54(F) LETTER
MARCH 1986	TVA PRESENTED ITS OVERALL RECOVERY PLAN (CORPORATE NUCLEAR PERFORMANCE PLAN)
AUGUST 1986	TVA DOCKETED THE BROWNS FERRY RECOVERY PLAN (BFNPP)
MARCH 1988	NRC COMMISSION BRIEFING ON SQN RESTART
MAY 1988	RESTART OF SEQUOYAH UNIT 2
NOVEMBER 1988	RESTART OF SEQUOYAH UNIT 1
JANUARY 1989	RELOADED FUEL IN BFN UNIT 2

BROWNS FERRY NUCLEAR PLANT RECOVERY PROGRAM STATUS

- **ORGANIZATION**
- **SITE MANAGEMENT**
- **OPERATIONS READINESS**
- **PROGRAMS**
- **PROJECT PLANNING AND SCHEDULING**

ORGANIZATION PROGRESS

- **PLACED PERSONNEL IN POSITIONS ON PERMANENT BASIS**
- **REPLACED CONTRACT MANAGERS WITH TVA PERSONNEL**
- **ELIMINATED ADVISORS**
- **IMPROVED COMPENSATION PLAN**

ORGANIZATION PROGRESS

- **DEVELOPED STANDARDIZED ORGANIZATION AND STAFFING PLAN**
- **REDUCED SITE PERSONNEL**
- **DEFINED AND INCREASED FOCUS ON FUNCTIONAL RESPONSIBILITIES**
- **COMBINED ENGINEERING AND MODIFICATIONS**

SITE MANAGEMENT PROGRESS

- **SELECTED MANAGERS WITH RIGHT ATTITUDE AND PROVEN RECORD**
- **EMPHASIZING PROFESSIONAL APPROACH TO NUCLEAR ACTIVITIES**
- **DEFINED EXPECTATIONS**
- **EMPHASIZED ACCOUNTABILITY**

OPERATIONS READINESS

- **SENIOR MANAGEMENT ONE-ON-ONE MEETINGS**
- **TEAM MEETINGS**
- **ESTABLISHED OPERATIONS IMPROVEMENT PLAN**
- **ACTIVATED MAINTENANCE IMPROVEMENT PROGRAM**
- **ESTABLISHED SYSTEM ENGINEER OWNERSHIP OF PLANT SYSTEMS**
- **LOADED FUEL**
- **INPO EVALUATION**
- **OPERATIONAL READINESS REVIEW - PHASE 1**

PROGRAMMATIC PROGRESS

- **MADE LINE MANAGEMENT RESPONSIBLE FOR INCIDENT INVESTIGATION**
- **IMPROVING 50.59 SAFETY ASSESSMENT PROGRAM**
- **FORMALIZED VENDOR INTERFACES**
- **IMPLEMENTED MAJOR UPGRADE OF OPERATING EXPERIENCE PROGRAM**

PROGRAMMATIC PROGRESS

- **UPGRADED TECHNICAL REVIEW AND VALIDATION OF PROCEDURES**
- **INCREASED USER INVOLVEMENT IN PROCEDURES UPGRADE**
- **REDUCTION OF CONDITIONS ADVERSE TO QUALITY**

PROJECT PLANNING AND SCHEDULING PROGRESS

- **RESOLUTION OF CRITERIA ON MAJOR PROGRAMS WITH NRC STAFF**
- **DEVELOPED INTEGRATED STARTUP SCHEDULE**
- **MONITOR 60-DAY SCHEDULE PERFORMANCE**
- **CONDENSER VACUUM MILESTONE**

- **WEEKLY REVIEW CYCLE**
- **IMPROVED CONTRACT MANAGEMENT**
- **IMPROVED DEFINITION OF TASKS**
- **TVA RESPONSIBILITY FOR CONTRACTOR PRODUCT**

BROWNS FERRY NUCLEAR PLANT

AGENDA

RECOVERY PROGRAM STATUS - O. D. KINGSLEY

SITE OVERVIEW - O. J. ZERINGUE

TECHNICAL ISSUES - H. WEBER

SUMMARY AND CONCLUSIONS - O. D. KINGSLEY

CULTURE

- **DEFENSIVE**
- **LACK OF ATTENTION TO DETAIL**
- **RESISTANT TO CHANGE**
- **SHALLOW EVALUATIONS AND INVESTIGATIONS**

**CHANGING SAFETY CONSCIOUS CULTURE BY
CLEARLY DEFINING EXPECTATIONS**

LESSONS LEARNED

- **CONDUCT OF OPERATIONS**
- **WORK CONTROL**
- **INCREASED EMPHASIS ON BALANCE OF PLANT**
- **INCIDENT INVESTIGATION - ROOT CAUSE**
- **IMPROVED STARTUP PROCEDURES AND TRAINING**
- **ADMINISTRATIVE PROCEDURES**
- **50.59 INITIATIVES**

SCHEDULE OVERVIEW

- **REEVALUATION OF EACH MAJOR PROJECT SCHEDULE (SEISMIC, EQ, ETC.)**
- **LEVEL II SCHEDULES FOR ALL MAJOR ACTIVITIES COMPLETE**
- **REFINEMENT OF THE SITE MASTER PUNCHLIST**
- **SCHEDULE MANAGEMENT**

SCHEDULE PERFORMANCE

- **CONDENSER VACUUM MILESTONE STATUS**
- **60-DAY SCHEDULE STATUS**

BROWNS FERRY NUCLEAR PLANT

AGENDA

RECOVERY PROGRAM STATUS - O. D. KINGSLEY

SITE OVERVIEW - O. J. ZERINGUE

TECHNICAL ISSUES - H. WEBER

SUMMARY AND CONCLUSIONS - O. D. KINGSLEY

STATUS OF MAJOR DESIGN ISSUES

ISSUES

- APPENDIX R
- ENVIRONMENTAL QUALIFICATION
- SEISMIC
- ELECTRICAL ISSUES

STATUS

- DESIGN WORK BASICALLY COMPLETE
- SAFE SHUT DOWN AUDIT COMPLETE
- FIRE PROTECTION AUDIT UNDERWAY ON SITE
- SOME FIELD WORK REMAINING
- DISCOVERY COMPLETE
- FIELD WORK UNDERWAY
- DISCOVERY COMPLETE
- FIELD WORK UNDERWAY
- DISCOVERY COMPLETE
- FIELD WORK UNDERWAY

RESOLUTION OF ENGINEERING PERFORMANCE PROBLEMS

PROBLEMS

- UNDERESTIMATED SCOPE
- MANAGEMENT OF CONTRACTORS
- DEFENSE OF POSITION VS. SOUND TECHNICAL SOLUTION
- ENGINEERING MANAGEMENT AT SITE
- COORDINATION BETWEEN ENGINEERING AND MODIFICATIONS

ACTIONS

- COMPLETION OF DISCOVERY PHASE
- TRANSFER OF EXPERIENCED ENGINEERS FROM SQN
- TVA ENGINEERS ASSUMING RESPONSIBILITY FOR TASK DIRECTION AND QUALITY OF WORK
- PROMPT RESOLUTION OF TECHNICAL CRITERIA
- SPEND TIME IN FIXING PROBLEMS, NOT TRYING TO CALCULATE BYPASS AROUND PROBLEM
- NEW PROJECT ENGINEER AND MOVING OF STRONG TEAM TO SITE
- SITE ENGINEERING SOLVING SITE PROBLEM WITH TVA STAFF SUPPORT VS. STAFF RESOLUTION WITH SITE SUPPORT
- COMBINED ENGINEERING AND MODIFICATIONS UNDER ONE MANAGER
- JOINT PLANNING AND BUDGET

BROWNS FERRY NUCLEAR PLANT

AGENDA

RECOVERY PROGRAM STATUS - O. D. KINGSLEY

SITE OVERVIEW - O. J. ZERINGUE

TECHNICAL ISSUES - H. WEBER

SUMMARY AND CONCLUSIONS - O. D. KINGSLEY

SUMMARY & CONCLUSIONS

- **CHANGING CULTURE**
- **RIGHT MANAGEMENT TEAM**
- **ESTABLISHING SCHEDULE CREDIBILITY**



POLICY ISSUE

(Information)

July 11, 1989

SECY-89-207

For: The Commissioners

From: Victor Stello, Jr.
Executive Director for Operations

Subject: STATUS OF STAFF ACTIONS REQUIRED TO BE COMPLETED BEFORE RESTART
OF BROWNS FERRY NUCLEAR PLANT, UNIT 2

Purpose: To provide the Commission with a summary report on the status
of the restart effort for Browns Ferry Nuclear Plant, Unit 2.

Background: The Browns Ferry Nuclear Plant consists of three units, each
rated at 1098 megawatts electrical output. Units 1 and 3 were
voluntarily shut down by the Tennessee Valley Authority (TVA) in
March 1985 because of questions about the primary containment
isolation leak rate testing for Unit 1 and reactor water level
instrumentation for Unit 3. Unit 2 was in a refueling outage at
the time. Additional questions and concerns were subsequently
raised about the overall adequacy of TVA's nuclear program, and
Browns Ferry has remained shut down until adequate corrective
actions have been defined and undertaken.

On September 17, 1985, the Nuclear Regulatory Commission (NRC)
requested, pursuant to 10 CFR 50.54(f), that TVA submit infor-
mation about its plans for correcting the problems at Browns
Ferry and for correcting problems in the overall management of
its nuclear program. The NRC also requested that this infor-
mation be submitted before TVA restarts Browns Ferry. In
response to this request, TVA prepared a Nuclear Performance
Plan, Volume 1, which identifies the root causes of the problems
in the management of TVA's nuclear program and describes TVA's
plans for correcting those problems. Additionally, TVA prepared
Nuclear Performance Plan, Volume 3, which identifies the root
causes of problems specifically related to Browns Ferry, defines
plans for correcting these problems, and responds to NRC's
request for information that is specific for Browns Ferry.
Taken together, these two plans provide an account of the
actions that TVA is taking to improve its nuclear program for
Browns Ferry. Although many of the programs associated with
Unit 2 are applicable to Units 1 and 3, Volume 3 is specifically
directed to Unit 2. An evaluation of the results and conclu-
sions drawn from the programs described in this volume will be

Contact: S. C. Black, NRR/TVA
49-20796

necessary to determine applicability to Units 1 and 3. That evaluation will be completed before the restart of Units 1 and 3.

Discussion: Since February 1987, the NRC staff and TVA have made progress in determining the issues to be resolved before the restart of Browns Ferry Unit 2. The staff has evaluated the Corporate Nuclear Performance Plan and documented its evaluation in a Safety Evaluation Report, NUREG-1232, Volume 1, dated July 1987.

The staff has been reviewing the Browns Ferry Nuclear Performance Plan, Volume 3, which identifies the root causes of problems specifically related to Browns Ferry, describes plans for correcting these problems, and responds to the Browns Ferry plant-specific issues raised in the 10 CFR 50.54(f) letter. The staff's safety evaluation report (SER) on this plan (NUREG-1232, Volume 3) was issued on April 14, 1989. However, the staff's evaluation of the plan is not complete, and supplements to this SER are scheduled. The staff also plans to closely monitor the plan's implementation at Browns Ferry.

Because of its continued inability to successfully meet its own projected dates for completing necessary engineering modifications for Unit 2, TVA has concluded that it cannot meet a previously projected restart date of September 1989. A revised Unit 2 restart date will be announced in August of this year, following TVA's 60-day assessment of its ability to meet its current schedule for completing the work required for restart.

Enclosure 1 categorizes the status of the key issues according to one of the following four categories: (A) NRC and TVA are in agreement regarding handling of the problem; NRC's review schedule is consistent with the licensee's schedule; (B1) NRC and TVA are in agreement regarding handling of the problem; TVA's schedule is not likely to be met; (B2) NRC and TVA are in agreement regarding handling of the problem; NRC's review is behind schedule, or (C) questions exist regarding handling of the problem. Each issue is summarized in Enclosure 2.

In the discussion that follows, the staff summarizes the four major Browns Ferry issues that appear at this time to have the greatest potential for affecting the Browns Ferry restart: environmental qualification of electrical equipment, adequacy of cable installation, cable ampacity and seismic issues.

(1) Environmental Qualification (EQ) of Electrical Equipment

TVA conducted a management review of the EQ programs at Sequoyah, Browns Ferry, and Watts Bar in July and August 1985. This review indicated that much of the qualification

documentation was not fully auditable and, in some cases, the documentation did not fully demonstrate qualification.

To correct the EQ problem, TVA initiated an EQ project, under which it began to evaluate, upgrade and consolidate documentation. Under this project entirely new reviews are being performed that are independent of previous EQ efforts at Browns Ferry. These reviews are now incorporating expertise from TVA staff members who were instrumental in the successful resolution of the EQ problem at TVA's Sequoyah facility. Significant hardware modifications still have to be implemented. The NRC staff's final inspection will be scheduled on the basis of TVA's projected date for completion of the project at Browns Ferry.

(2) Adequacy of Cable Installation

Several cable-pulling concerns have been identified at Browns Ferry as a result of generic reviews of conditions adverse to quality reports (CAQRs) issued at Sequoyah. These concerns include the following:

- ° Cable sidewall pressure may have been exceeded during installation.
- ° Cables installed in conduits having long vertical runs may be damaged because of insufficient support.
- ° Cable manufacturer's limitations for minimum bend radius may have been exceeded where pull boxes or condulets are used to facilitate installation.

TVA has initiated a walkdown inspection program at Browns Ferry to evaluate each of the above concerns. Appropriate corrective action will be taken where required. The program is based on test or analysis (as justified) and makes use of Sequoyah's experience.

Most TVA inspections and walkdowns have been completed and most potential restart modifications have been identified. The staff is awaiting the final report from TVA.

(3) Cable Ampacity

A finding by the Institute of Nuclear Power Operations pertaining to the Bellefonte Nuclear Plant concerning the lack of design calculations showing the adequacy of cable ampacities resulted in a CAQR applicable to all TVA nuclear plants. As a result, TVA determined that its design

standards were incomplete and did not properly account for the effects of cable environment on cable ampacity. Since these standards were used for the initial design of cable installations at Browns Ferry, the potential exists for the undersizing of safety-related cable at Browns Ferry. Inadequate ampacity design calculations have resulted in the inability to determine if electrical current carried by cables will result in cable overheating and deterioration of insulation. A new electrical design standard based on various industry standards and test reports was subsequently developed and applied by TVA to cables replaced in safety-related circuits at Browns Ferry.

A program to determine the extent of non-conformance to the current standard has been developed and is being implemented. The program is based on walkdowns of installed cable trays and conduits and includes 100 percent of the safety-related ac or dc auxiliary power cable installations up to 15 kilovolts. Calculations are being performed to determine limiting ampacity values based on environment and TVA standards. Nonconforming cable installations will be documented and tracked through the CAQR program. Appropriate corrective action related to cable ampacity will be determined and planned through analysis of each nonconformance. The staff's review of this program is underway. All potential problems and modifications have not yet been identified.

(4) Seismic Issues

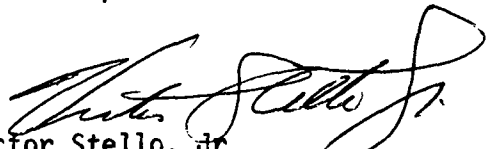
Concerns have surfaced related to the structural adequacy of various safety-related systems in nuclear facilities. Some of these concerns were identified through nuclear industry programs, such as the Long Term Torus Integrity Program and IE Bulletins 79-02 and 79-14. Other concerns were identified by TVA reviews or NRC inspections citing undocumented conditions. Resolution of these concerns will address loads due to pressure, temperature, dead and live loads, as well as seismic loads.

TVA has undertaken programs to identify and correct deficiencies in the installed configuration. The staff has reviewed the seismic design program at Browns Ferry and agrees with the restart criteria to be used for Browns Ferry Unit 2. TVA is currently implementing these programs and undertaking the necessary modifications resulting from these programs.

The staff has performed a number of audits and inspections of the Seismic Design Program. In the civil/structural disciplines, the staff is closing the open items identified in its inspection reports. However, in the piping discipline, TVA's decision to change contractors has delayed the completion of the IE Bulletin 79-14 and 79-02 piping program. The staff's inspection of the implementation of this piping program is required before restart of Browns Ferry Unit 2.

The NRC staff has developed a Master Inspection Program (MIP) for the restart of Browns Ferry Unit 2. This program has been designed to provide adequate assurance that programs in the Nuclear Performance Plan, Volume 3, have been adequately implemented and that the unit can be safely started up and operated. The staff has identified for each major inspection activity specific prerequisites that TVA must satisfy before an inspection can take place. These prerequisites will be incorporated into TVA's planning/scheduling process and when a restart schedule has been issued by TVA, the staff will prepare a final schedule for its major inspection activities.

Conclusion: Following the completion of the restart efforts for both of the Sequoyah units, TVA and the NRC staff have made substantial progress in resolving many of the issues required for the restart of Browns Ferry Unit 2. A small number of issues still need to be technically resolved and key program implementation must be completed before the staff will be able to determine if Browns Ferry Unit 2 is ready for restart. Major inspections must still be completed and are dependent on TVA's readiness.



Victor Stello, Jr.
Executive Director
for Operations

Enclosures:

1. Status of Significant Issues
Regarding Browns Ferry Unit 2
2. Technical Issues Summary Sheets

DISTRIBUTION:

Commissioners

OGC

OIG

GPA

REGIONAL OFFICES

ACRS

ASLBP

ASLAP

SECY

EDO

ENCLOSURE 1

STATUS OF SIGNIFICANT ISSUES REGARDING BROWNS FERRY UNIT 2

STATUS OF SIGNIFICANT ISSUES REGARDING BROWNS FERRY UNIT 2

<u>ISSUE</u>	<u>A</u>	<u>B1</u>	<u>B2</u>	<u>C</u>
Browns Ferry Management Corporate Plan	X			
Quality Assurance	X			
Design Baseline and Verification Program/ Design Calculations Review	X			
Seismic Design		X		
Electrical Issues (Ampacity) (Cable Installation and Separation)	X			X
Fire Protection	X*			
Environmental Qualification		X*		
Welding	X			
Technical Specifications	X			
Intergranular Stress Corrosion Cracking	X			
Procurement Concerns		X*		
Maintenance	X*			
Restart Test Program	X			
Procedure Upgrade		X*		
Operational Readiness	X			
Operator Training	X			
Emergency Operating Procedures	X			
Employee Concerns	X			
Risk Assessment (Single Failure)	X			

* Inspection is still necessary

NOTES:

- A - NRC and TVA are in agreement regarding handling of the problem. NRC's review schedule is consistent with the licensee's schedule.
- B1 - NRC and TVA are in agreement regarding handling of the problem. Licensee's schedule is not likely to be met (e.g., implementation problems).
- B2 - NRC and TVA are in agreement regarding handling of the problem. NRC's review is behind schedule.
- C - Questions exist regarding handling of the problem (e.g., discovery stages).

ENCLOSURE 2

TECHNICAL ISSUES SUMMARY SHEETS

CONTENTS

	<u>Page</u>
I. MANAGEMENT.....	1
Corporate Plan.....	1
Browns Ferry Site Management.....	2
Quality Assurance.....	3
II. ADEQUACY OF BROWNS FERRY DESIGN.....	4
Design Baseline and Verification Program.....	4
Design Calculations Review.....	5
Seismic Design.....	6
III. ELECTRICAL ISSUES.....	7
Cable Installation.....	7
Ampacity.....	8
Cable Separation.....	10
IV. OTHER TECHNICAL ISSUES.....	11
Fire Protection.....	11
Environmental Qualification.....	12
Welding.....	13
Technical Specifications.....	14
Intergranular Stress Corrosion Cracking (IGSCC).....	15
Procurement Concerns.....	16
Maintenance.....	17
V. RESTART READINESS.....	18
Restart Test Program.....	18
Procedure Upgrade.....	19
Operational Readiness.....	20
Operator Training.....	21
Emergency Operating Procedures.....	22
VI. EMPLOYEE CONCERNS.....	23
VII. RISK ASSESSMENT.....	24

I. MANAGEMENT

ISSUE: Corporate Plan

PROBLEM: In its 10 CFR 50.54(f) letter of September 17, 1985, the NRC staff requested that TVA supply specific information regarding actions it has taken or is planning to take to improve corporate oversight, direction, and support of nuclear power activities.

TVA ACTION: In response to the 10 CFR 50.54(f) letter, TVA submitted its Corporate Nuclear Performance Plan (revised). This plan describes actions TVA has taken to improve its overall management of its nuclear program. These actions include hiring, training, developing, and providing for the retention of experienced nuclear managers; restructuring the TVA organization to concentrate authority for nuclear operations under a manager of nuclear power and removing all non-nuclear activities from his purview; consolidating the quality assurance/quality control functions; establishing clear lines of responsibility for engineering activities; reorganizing the training program; and centralizing licensing activities. In addition, TVA has taken steps to improve employee confidence in TVA's nuclear management.

NRC RESPONSE: The staff has concluded that, from a programmatic standpoint, TVA has acceptably addressed the corporate-level concerns raised by the staff in the 10 CFR 50.54(f) letter. Since the TVA corporate plan is programmatic, its effectiveness depends on its implementation, which the staff is monitoring. Staff observations to date are generally favorable.

STATUS: The program review is complete. Implementation is currently being monitored. The staff's evaluation was issued in July 1987 in NUREG-1232, Volume 1.

POTENTIAL PROBLEMS: None are anticipated.

ISSUE: Browns Ferry Site Management

PROBLEM: In its 10 CFR 50.54(f) letter of September 17, 1985, the NRC staff requested that TVA supply specific information regarding actions it has taken or is planning to take to improve management oversight, direction, and support of Browns Ferry activities.

TVA ACTION: In response to the 10 CFR 50.54(f) letter, TVA submitted the Nuclear Performance Plan (NPP) for Browns Ferry (Volume 3 of the NPP). In this plan, TVA describes corrective actions to (1) restructure the Browns Ferry site organization so that it is compatible with the revised corporate structure, (2) prepare position descriptions that delineate areas of responsibility and authority for site management, including reporting channels and interfaces; (3) define training activities, such as shift technical advisor training or senior reactor operator license training for managers; and (4) establish specific site improvements, such as a site licensing group.

NRC RESPONSE: The staff is reviewing and monitoring its implementation. The staff's evaluation of Browns Ferry site management will be included in a supplement to NUREG-1232, Volume 3.

STATUS: The recent hiring of key senior managers is a strength, and it appears that a strong team is coalescing.

POTENTIAL PROBLEMS: None are anticipated.

ISSUE: Quality Assurance

PROBLEM: In its 10 CFR 50.54(f) letter of September 17, 1985, the NRC staff referred to a number of instances of poor performance in the quality assurance area, including three successive Systematic Assessment of Licensee Performance periods during which the rating in this area was Category 3 (which means that increased NRC attention is warranted) at both Sequoyah and Browns Ferry.

TVA ACTION: In response to the 10 CFR 50.54(f) letter, TVA revised its QA topical report to include the following changes: (1) restructuring the nuclear QA organization to include a site representative at each site who reports to the Director of Nuclear Quality Assurance, (2) consolidating all nuclear QA and quality control (QC) functions under the Director of Nuclear Quality Assurance, (3) adding an engineering assurance organization for auditing TVA engineering work, and (4) increasing emphasis on corrective action and root cause analysis programs.

In March 1989, TVA submitted a new QA program plan designed to replace the approved topical report. This new plan represents a significant change in philosophy of TVA's QA program, and includes a reorientation of QA/QC efforts toward a "graded approach." Additionally, TVA submitted an organizational topical report that reflects recent changes in TVA's organization including integration of the QA functions of the engineering assurance organization under the nuclear QA organization.

NRC RESPONSE: In January 1987, the staff approved the revised QA program and QA organization described in the revised QA topical report. It is conducting inspections to verify program implementation and to evaluate the conditions adverse to quality report process.

The staff is reviewing the new QA program plan and the organizational topical report. The plan appears to reduce the scope of the previously approved QA program.

STATUS: TVA has implemented the QA program approved in January 1987. The staff has completed a quality verification functional inspection during which problems were identified that have to be resolved before restart.

The staff has performed an initial review of the new QA program plan and has directed TVA to not implement the new plan until NRC approval is granted. The staff has requested additional information and expects to make a decision by late 1989. The organizational topical report is also undergoing staff review and approval is expected in the fall.

POTENTIAL PROBLEMS: Future inspections and staff review of the proposed QA plan and organizational changes may identify additional restart requirements.

II. ADEQUACY OF BROWNS FERRY DESIGN

ISSUE: Design Baseline and Verification Program

PROBLEM: Questions were raised during a review conducted for TVA by Gilbert Commonwealth in 1985 regarding the adequacy of the existing TVA design control process. Examples included missing calculations, incomplete design documentation, and failure to update as-built drawings to reflect plant configuration.

TVA ACTION: TVA developed the design baseline and verification program (DBVP) to reestablish the design baseline for the Browns Ferry facility. This program includes (1) establishing the plant configuration, (2) reconstructing the design basis, (3) reviewing and evaluating modifications, (4) defining and performing required tests to verify the function of DBVP systems, and (5) implementing modifications developed from this program. Under this program, design criteria documents, as-configured drawings, and test requirement documents have been issued for the associated DBVP systems.

NRC RESPONSE: The staff has conducted a limited-scope inspection of controlled configuration drawings and identified no significant concerns. It performed a programmatic inspection of the DBVP in October 1987 and April 1988. The staff concluded that the DBVP contains the essential elements and, if properly implemented, its goals and objectives will be achieved. It recently conducted an inspection of controlled drawings and the calculational portion of the DBVP and determined that certain findings may require TVA followup before restart.

STATUS: The program review is complete. The staff's evaluation is included in the NUREG-1232, Volume 3.

POTENTIAL PROBLEMS: None are anticipated.

ISSUE: Design Calculations Review

PROBLEM: TVA instituted a review of essential design calculations to verify that the calculations existed and were adequate to support the design of Browns Ferry. As a result of the review, TVA estimates that a large number of calculations are not retrievable.

TVA ACTION: TVA has initiated a review of the engineering calculations in the electrical, nuclear, mechanical, and civil areas. In the electrical and mechanical areas, 100 percent of the calculations will be reviewed. The civil and nuclear calculations will be sampled in accordance with nationally accepted sampling criteria (Nuclear Construction Issues Group, NCIG-02).

NRC RESPONSE: The staff is reviewing TVA's calculations program. It conducted an inspection of the DBVP aspects of the calculations program in April 1988 and March 1989. The staff has not yet identified any major deficiencies associated with the calculations program.

STATUS: The program review is complete.

POTENTIAL PROBLEMS: Review of the program implementation is still ongoing and may result in additional modifications that could affect restart.

ISSUE: Seismic Design

PROBLEM: Deficiencies were identified in regard to the torus; piping and piping supports; cable tray supports; conduit supports; heating, ventilation, and air conditioning ductwork; drywell steel platforms; miscellaneous steel; Class II over I features; secondary containment penetrations; and miscellaneous civil design issues. In its 10 CFR 50.54(f) letter of September 17, 1985, the NRC staff requested that TVA supply information regarding the programs being used to evaluate some of these issues in regard to seismic adequacy.

TVA ACTION: In response to the 10 CFR 50.54(f) letter, TVA submitted program descriptions in the August 1986 Nuclear Performance Plan (NPP) which was subsequently revised in July 1987, and in a separate April 1987 submittal. Program summary and review meetings were held with the NRC in September 1987 and February 1988. Ongoing dialogue between TVA and the staff continues. TVA has initiated comprehensive programs to review these issues and determine acceptability for operation before restart.

NRC RESPONSE: The staff's review of TVA's program implementation is ongoing.

STATUS: TVA has identified a wide range of seismic design issues in Volume 3 of the NPP. It has submitted programs for the review and resolution of these issues to the NRC for review and approval. Additional resolution of outstanding items resulting from the staff review is still required. The staff has issued a safety evaluation (SE) for cable tray supports. The results of additional SEs will be included in supplements to NUREG-1232, Volume 3.

POTENTIAL PROBLEMS: Most technical issues have been resolved, or the resolution required has been agreed to by TVA. Corrective actions are under way. The implementation of the piping program by TVA in response to IE Bulletins 79-14 and 79-02 has been further delayed, and final staff inspection is required before restart.

III. ELECTRICAL ISSUES

ISSUE: Cable Installation

PROBLEM: A number of TVA employee concerns at Watts Bar and/or at Sequoyah indicated that cable-pulling practices violated procedures and/or procedures were not adequate to ensure cable integrity following installation. Cable damage during installation may have occurred from over-tensioning of cables pulled through conduits or raceways, cables pulled through conduits with existing cables (pullbys) in the conduits, cable jamming, lack of support of cables in vertical conduits, and short radius bending of the cable. This condition may also be applicable at Browns Ferry. No employee concerns exist that are specific to Browns Ferry.

TVA ACTION: To ensure that cables were properly installed at Browns Ferry, TVA is using the resolution for the cable installation issues at Sequoyah to bound the issue at Browns Ferry. To accomplish this, TVA is proposing to demonstrate that the Browns Ferry cable installation requirements and insulation material are similar to those at Sequoyah. During walkdowns conducted by TVA, damage has been observed in some cables.

NRC RESPONSE: The staff will review TVA's proposed resolution following submittal of this resolution and receipt of TVA's final report on damaged cables. The staff has inspected the damaged cable at the site and preliminarily agrees with TVA's proposed resolution as conveyed to the staff in several meetings.

STATUS: TVA is preparing its final report on the cable installation issues. The staff's evaluation will be included in a supplement to NUREG-1232, Volume 3.

POTENTIAL PROBLEMS: None are anticipated.

ISSUE: Ampacity

PROBLEM: Findings by the Institute of Nuclear Power Operation on the Bellefonte plant revealed a lack of design calculations that demonstrate the adequacy of cable ampacity. These findings were confirmed by the Bellefonte electrical evaluation team and calculations were performed to verify the adequacy of cable ampacity. As a result of the Bellefonte review, cable ampacity was also evaluated at Browns Ferry and Sequoyah. These plants also did not have design calculations to demonstrate the adequacy of cable ampacity.

TVA ACTION: TVA has issued design standard ampacity tables for auxiliary and control power cables (0-15,000 volts) to provide the minimum requirements necessary for proper sizing of electrical cables. TVA has established a two-part program to determine the adequacy of installed cables at Browns Ferry. In Part I, all Class 1E cables separately routed and non-Class 1E cables routed with Class 1E cables are being reviewed. Specific criteria have been provided for the evaluation of the cables to substantiate their acceptability on the basis of actual and allowable ampacity requirements. The objective is to provide firm justification for operation. Those cables for which operation is not justified will be replaced.

The ampacity program at Browns Ferry unlike the Sequoyah program assumes credit for load diversity of cable in raceways and time diversity for cables not simultaneously required to be energized. TVA is conducting tests to justify the load diversity whereby some overloaded cables can remain acceptable when mixed with lightly loaded cables to ensure proper heat dissipation and prevent cable insulation damage.

Part II of the program will involve a detailed evaluation of all cables not reviewed in the Phase I sampling program. The purpose of Part II is to ensure that all plant power cables are adequately sized and appropriately documented.

NRC RESPONSE: The staff is continuing its review of the ampacity program at Browns Ferry.

STATUS: TVA is performing calculations to determine limiting ampacity values based on environment. The adequacy of safety-related auxiliary power cable installations will be established before Unit 2 restart.

ISSUE: Ampacity (continued)

POTENTIAL
PROBLEMS:

TVA's cable ampacity program has not yet demonstrated adequately conservative bounding conditions for load diversity derating factors. The staff and its consultant (Sandia National Laboratory) have conducted cable-loading simulations similar to those conducted by TVA, and the results do not agree with TVA's findings on the adequacy of derating factors. The staff and TVA are reviewing potential simulation modeling differences. The operability of the cables supplying safety related equipment cannot be shown for the cables intended design life. No basis exists which shows that cables can dissipate their generated heat during use, without overheating and thus overstressing the cable insulation and causing cable insulation breakdown.

ISSUE: Cable Separation

PROBLEM: TVA has identified instances where electrical cable separation requirements identified in the Final Safety Analysis Report have not been met.

TVA ACTION: TVA has evaluated a statistically significant sample of installed cables to confirm that cables that violate the separation requirements will not affect plant safety. TVA, by letter dated June 9, 1989, has submitted the results of its evaluation for staff review.

NRC RESPONSE: On May 11, 1989, TVA presented to the staff its approach for resolving the issues and the preliminary results of its evaluation.

The staff, on the basis of TVA's presentation, has reached a preliminary conclusion that TVA's approach to resolving the issues and the evaluation results are acceptable.

STATUS: The staff is reviewing TVA's submittal dated June 9, 1989.

POTENTIAL
PROBLEMS: None are anticipated.

IV. OTHER TECHNICAL ISSUES

ISSUE: Fire Protection

PROBLEM: NRC approval of the fire protection program in compliance with 10 CFR Part 50, Appendix R, is required for restart of Unit 2.

TVA ACTION: TVA submitted its analyses of safe shutdown systems in compliance with Appendix R in January 1986. Five exemptions from Appendix R requirements were requested and granted. TVA has submitted revised technical specifications to support Appendix R compliance for Unit 2 operation with Units 1 and 3 shut down. TVA is also finishing extensive modifications in fire protection systems in preparation for the Appendix R fire protection inspection scheduled for July 1989.

NRC RESPONSE: The staff approved and granted exemptions to Appendix R requirements on October 21, 1988. In December 1988, it issued an SER on post-fire shutdown systems. It provided its review of deviations from the National Fire Protection Association (NFPA) codes to TVA on December 14, 1988. It completed an inspection to determine compliance with Appendix R in regard to safe shutdown capability in May 1989. No significant findings or violations were noted.

STATUS: The staff has requested docketing of additional information required to support the revised Appendix R technical specification submittal and the fire protection part of the Appendix R inspection scheduled for July 1989.

The NRC staff has not approved:

- (1) Appendix R safe shutdown technical specifications
- (2) The fire protection program in compliance with Appendix R
- (3) NFPA code deviations in cable spreading room (TVA evaluation is needed)

In addition, nine inspection followup items and one unresolved issue outstanding from the May 1989 inspection need resolution.

POTENTIAL
PROBLEMS: None are anticipated.

ISSUE: Environmental Qualification

PROBLEM: Insufficient documentation existed to demonstrate that electrical equipment at the plant was environmentally qualified as required by 10 CFR 50.49.

TVA ACTION: TVA has developed an upgraded environmental qualification (EQ) program to identify equipment, specify environments, verify equipment in the field, document equipment qualification, specify maintenance requirements, maintain EQ binders, and replace unqualified equipment if necessary. The necessary documentation is being completed and verified in the field. Any required modifications will be completed before restart.

NRC RESPONSE: The staff will review TVA's EQ effort before restart.

STATUS: The staff performed one EQ inspection in May 1988. Some problems were identified, including a lack of lessons learned from Sequoyah, and as a result the program has not progressed sufficiently to support the anticipated restart schedule. The staff is waiting for TVA to further complete its program before scheduling another EQ inspection before restart. Completion of the EQ program is the critical path for restart.

POTENTIAL PROBLEMS: Potential problems are qualification of motor control centers in the reactor building and qualification of electrical cables located in the drywell, but not installed in conduits.

ISSUE: Welding

PROBLEM: Concerns were raised at the Watts Bar site regarding TVA's inspection practice and welding rod control program. These concerns implicated the quality of weldments and the capability of the welds to perform their function.

TVA ACTION: TVA is conducting a reassessment program in two basic phases. Phase I consists of programmatic review of commitments and procedures for implementing the commitments; Phase II consists of a physical reinspection of sample welds. Phase II also consists of an evaluation of the implementation of procedures and the adequacy for service of installed weldments, including correction of any problems.

NRC RESPONSE: The TVA welding programs are administered by a common project group. The NRC staff has reviewed the Sequoyah program and found it acceptable. Phase I and Phase II of the welding project for Browns Ferry have been submitted and have been reviewed by the NRC staff. An NRC staff inspection of Phase I conducted in April 1987 showed that the necessary elements existed to translate welding commitments into specifications and drawings. The staff conducted an inspection of Phase II in May and June 1988. It did not note any significant deficiencies associated with TVA's welding reviews.

STATUS: The staff's review of the welding activities at Browns Ferry (Phases I and II) found the program and its implementation to be acceptable as supplemented by TVA's followup corrective actions. The staff has prepared a safety evaluation report on the Browns Ferry welding activities.

POTENTIAL
PROBLEMS: None are anticipated.

ISSUE: Technical Specifications

PROBLEM: TVA and the NRC have identified and agreed on a list of 36 technical specification (TS) changes requiring approval by the NRC before Browns Ferry can enter the startup mode. These changes involve clarifications, corrections, modifications and organizational and regulatory changes.

TVA ACTION: TVA has submitted 32 of the required TS changes for staff review. The other changes are scheduled to be submitted so as to allow time for NRC review and TVA implementation before restart.

NRC RESPONSE: Of the 32 restart TS changes submitted, the staff has approved 24 of them. Eight packages are still under staff review.

STATUS: The preparation and review effort is in progress at TVA and the NRC. The staff expects to issue the last restart TS amendment in the fall of 1989. TVA implemented a TS verification program under its quality assurance organization. The staff will audit TVA's program.

POTENTIAL PROBLEMS: All potential restart TS changes resulting from other programs (i.e., design baseline verification, calculations, ampacity) have not been identified.

ISSUE: Intergranular Stress Corrosion Cracking

PROBLEM: Intergranular Stress Corrosion Cracking (IGSCC) is evident to some degree at all three units. The IGSCC mitigation options are primarily replacement, weld overlay, induction heating stress improvement (IHSI), and/or hydrogen water chemistry. IE Bulletins 82-03 and 83-02 and Generic Letters 84-11 and 88-01 were issued by the NRC staff to address this problem.

TVA ACTION: TVA has inspected 100 percent of all accessible/susceptible welds in the recirculation, core spray, reactor water cleanup, and residual heat removal (RHR) systems for Units 1, 2, and 3. Units 1 and 3 were inspected to the requirements of IE Bulletin 83-02 in 1983. The staff also recommended that all of the remaining IHSI-treated welds (71) be inspected before restart. During this inspection, which TVA completed, additional flaws were identified.

The IGSCC mitigation and repair measures for the recirculation and RHR piping that are implemented at Unit 2 include weld overlay, weld replacement, and IHSI treatment of welds with shallow cracks. IHSI was implemented on most susceptible welds that could be treated successfully. TVA has replaced all ten recirculation inlet safe ends and two jet pump instrumentation safe ends on Unit 2. Replaced safe ends have undergone IHSI. Mitigation steps will be taken for Units 1 and 3 before restart.

TVA recognized the importance of hydrogen water chemistry in mitigating the IGSCC problem, and interface connections are being installed on Unit 2 this outage to allow introduction of hydrogen water chemistry in mid-cycle.

NRC RESPONSE: The staff performed an onsite review of the Browns Ferry IGSCC mitigation program. The staff has concluded that TVA must take some further actions in order to adequately address IGSCC at Browns Ferry. The staff has also completed an inspection of the implementation of Generic Letter 88-01 at Unit 2.

STATUS: Weld inspections performed after the post-replacement IHSI of the Unit 2 safe ends are complete. Post-IHSI inspections have recently identified additional indications requiring repairs before restart.

POTENTIAL PROBLEMS: None are anticipated.

ISSUE: Procurement Concerns

PROBLEM: From TVA Nuclear Safety Review Staff reports between 1983 and 1985 and during an inspection in November 1986, the NRC staff determined that TVA had procured replacement parts for safety-related equipment without appropriate procurement controls to ensure that replacement items were tested or qualified for their safety-related applications.

TVA ACTION: TVA has undertaken an extensive program to review and evaluate past and present procurement of replacement items. TVA is establishing qualification of items or replacing items on equipment required for restart on a priority basis.

NRC RESPONSE: The staff is reviewing TVA's programmatic approach. An inspection of program implementation will be scheduled before restart.

STATUS: The program review is in progress. The staff's safety evaluation will be included in a supplement to NUREG-1232, Volume 3. The approach at Browns Ferry is similar to the approved approach at Sequoyah.

POTENTIAL PROBLEMS: None are anticipated.

ISSUE: Maintenance

PROBLEM: Programmatic problems in site maintenance were previously identified in Systematic Assessment of Licensee Performance (SALP) and inspection reports. This area received repeated SALP Category 3 ratings. The problems were attributed to such factors as poor supervision of work activities, inadequate planning, ineffective root cause analysis, inadequate training, and poor coordination between different organizations to support maintenance activities.

TVA ACTION: TVA has developed and is implementing a comprehensive maintenance improvement program that identifies several essential improvements. The program encompasses needed improvements identified by TVA and by the Institute of Nuclear Power Operations in its evaluations and recommendations and deficiencies identified by the staff. Program elements being improved include programmatic aspects of maintenance, preventive failure analysis, maintenance, procedures upgrade, training, personnel certification qualifications, and facilities for the conduct of maintenance. To ensure success at Browns Ferry, TVA has committed resources and has established a staff of senior line managers with authority to develop and implement the maintenance improvement program.

NRC RESPONSE: TVA made a programmatic presentation to the NRC staff and the program was favorably received by the NRC. The staff is planning individual and team inspections to verify program implementation.

STATUS: The program is ongoing. Implementation is currently being monitored. The staff's safety evaluation will be included in a supplement to NUREG-1232, Volume 3.

POTENTIAL PROBLEMS: Improvements have been made in the conduct of maintenance at Browns Ferry. However, the overall effectiveness of the maintenance program is being affected because of a lack of permanent maintenance manager. Implementation of improvements in the area of maintenance may adversely affect the restart schedule. Following a recent TVA audit of maintenance activities, they requested that the NRC Maintenance Team Inspection be delayed until at least the end of September 1989.

V. RESTART READINESS

ISSUE: Restart Test Program

PROBLEM: Because of the prolonged plant shutdown and extensive modifications, a comprehensive restart test program is required to ensure plant systems are capable of meeting their safe shutdown requirements.

TVA ACTION: TVA has developed a restart test program that includes individual and integrated system testing and backup control tests. Criticality and power ascension testing are implemented under separate test programs. Under the design baseline and verification program, TVA developed the system test requirements necessary to satisfy the safe shutdown analysis. The program involves the development of test procedures and where possible utilizes existing operation and surveillance instructions. A summary description of the program was submitted on July 13, 1987.

NRC RESPONSE: The staff has reviewed and approved TVA's restart test program for Unit 2.

STATUS: Restart tests are being conducted and evaluated.

POTENTIAL PROBLEMS: Testing may reveal needed equipment modifications. For example, testing of the control air system and diesel generators identified equipment and system deficiencies.

ISSUE: Procedure Upgrade

PROBLEM: TVA identified a number of deficiencies and weaknesses in the procedures.

TVA ACTION: TVA has implemented a procedures upgrade program to address these problems. The near-term portion of this program is focused on resolving deficiencies in the procedures that affect the safe restart, operation, and shutdown of the plant. Procedures that are not required for restart, operation, and shutdown will be upgraded as part of the long-term program. The program requires a review of procedures for technical content, administrative controls, regulatory requirements and performability.

NRC RESPONSE: The staff has conducted inspections of this program and will schedule additional inspections to review completed procedures as they become available. The staff generally agrees with the TVA program.

STATUS: The NRC staff's evaluation of procedures is ongoing. The staff's safety evaluation has identified weaknesses in the verification and validation (V&V) of procedures. TVA's response has been a limited enhancement of its V&V activities. Overall, the procedure upgrade program has resulted in some improvement in the workability of procedures. However, on the basis of the large number of safety system actuations resulting from procedural problems and NRC inspection findings, the procedures at Browns Ferry require significant upgrade before restart. The staff has scheduled followup implementation inspection before restart.

POTENTIAL PROBLEMS: Upgraded procedures will be needed to support the restart effort. The schedule for restart may be affected if the program is not implemented in a timely manner.

ISSUE: Operational Readiness

PROBLEM: A comprehensive effort to assess Browns Ferry's material condition and personnel readiness to support safe plant restart and operation is required because of the extended outage, changes in the site and support organizations, realignment of responsibilities, and implementation of new programs to correct past problems.

TVA ACTION: TVA has established programmatic guidance for verifying operational readiness. TVA is currently documenting commitments and statements of intention from the Browns Ferry Nuclear Performance Plan to be used to verify adequate implementation of the plan. TVA is also defining performance objectives, criteria, and evaluation plans to ensure that site organizations function effectively and are prepared for plant restart and operation.

NRC RESPONSE: The staff will independently assess TVA's readiness for restart. It is currently reviewing TVA plans for the operational readiness program as described in the Browns Ferry Nuclear Performance Plan. The staff's evaluation will be included in a supplement to NUREG-1232, Volume 3.

STATUS: Efforts are ongoing.

POTENTIAL PROBLEMS: None are anticipated.

ISSUE: Operator Training

PROBLEM: From the results of NRC-administered requalification examinations, the NRC staff determined that the TVA operator training program had several programmatic weaknesses.

TVA ACTION: TVA has undertaken a comprehensive one-time training program to upgrade all licensed operators. Beginning in 1987, TVA increased its annual requalification training for licensed operators from at least four to six weeks. The TVA Browns Ferry simulator was moved to the Browns Ferry site to improve operator access to the simulator and to allow for more effective overall training. The licensed operator training program was accredited by the Institute of Nuclear Power Operation in March 1986.

NRC RESPONSE: The staff finds TVA's programmatic approach is acceptable. Inspection of the reactor operator training program is complete. Passing rates on the NRC-administered requalification examinations for TVA operators who completed the upgrade course were greatly improved. The overall passing rate was 80 percent or better.

STATUS: NRC's requalification testing of TVA operators is ongoing. The staff's evaluation will be included in a supplement to NUREG-1232, Volume 3. There are a sufficient number of operators qualified for Unit 2 restart.

POTENTIAL PROBLEMS: None are anticipated.

ISSUE: Emergency Operating Procedures (EOPs)

PROBLEM: Browns Ferry, Units 1 and 3 will not be operational when Unit 2 is restarted. The emergency operating procedures (EOPs) which have been finalized were prepared for three operational units. Some actions may be required to assure that the equipment, staffing and procedures will satisfy emergency requirements under the Unit 2 only startup conditions.

TVA ACTION: TVA has been modifying equipment and revising procedures for emergency operation in response to regulatory requirements. In the final EOPs, TVA is including responses to an NRC inspection conducted in August 1988.

NRC RESPONSE: An NRC inspection team conducted an onsite review and audit of the Browns Ferry EOPs in August 1988. This was one of the inspections being conducted by four NRC teams to examine the results of the NRC long-term program for upgrading EOPs and the application of procedures generation packages. The staff provided the findings of the inspection at Browns Ferry to TVA for action. TVA's response to these findings has been received and is under review.

STATUS: The staff is planning a followup inspection to be conducted approximately two to three months before Unit 2 restart to confirm TVA's corrective actions and the readiness of the Browns Ferry staff for Unit 2 operation.

POTENTIAL PROBLEMS: None are anticipated.

VI EMPLOYEE CONCERNS

ISSUE: Employee Concerns

PROBLEM: Under the employee concerns program initiated at Watts Bar in 1985 more than 5800 employee concerns were identified. Approximately 700 safety and non-safety concerns identified under the program were applicable to Browns Ferry by direct reference or generic applicability.

TVA RESPONSE: TVA has divided the concerns into nine categories: construction, engineering, operations, materials control, welding, quality assurance, industrial safety, management and personnel, and harassment and intimidation. Investigations and corrective actions for Browns Ferry are being documented and submitted in subcategory reports. Harassment and intimidation concerns are being addressed separately by the TVA Inspector General.

Concerns identified under the new employee concerns program, which was initiated on February 1, 1986, are being investigated and resolved separately.

NRC RESPONSE: The staff's initial inspection in 1987 showed that there were no major findings.

STATUS: Preparation of the subcategory reports has resulted in the issuance of 224 corrective action tracking documents. The staff is beginning to review a sampling of the licensee's resolution of employee concerns.

POTENTIAL PROBLEMS: Resolution of some concerns may require TVA to do additional work before restart.

VII. RISK ASSESSMENT

ISSUE: Risk Assessment

PROBLEM: The NRC staff requested, by letters dated June 17 and August 15, 1986, that TVA provide the draft probabilistic risk assessment (PRA) for Browns Ferry.

TVA ACTION: TVA provided the draft PRA on November 20, 1986. It also provided a summary report of new calculations based on its revised draft PRA.

NRC RESPONSE: The NRC staff provided the results of its limited-scope review of the draft PRA to TVA on October 1, 1987, as well as its review of the summary report that included an audit of the revised PRA.

STATUS: The staff performed an audit of the newly revised draft PRA in November 1988 and sent one significant finding of this audit to TVA for resolution before restart. TVA's response to this finding is currently under staff review.

POTENTIAL PROBLEMS: None are anticipated.