

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Title: **BRIEFING ON STATUS OF WATTS BAR AND
BROWNS FERRY 3 - PUBLIC MEETING**

Location: **Rockville, Maryland**

Date: **Wednesday, July 12, 1995**

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2 NUCLEAR REGULATORY COMMISSION
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6 BRIEFING ON STATUS OF WATTS BAR AND BROWNS FERRY 3
7 PUBLIC MEETING
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10 Nuclear Regulatory Commission
11 One White Flint North
12 Rockville, Maryland
13

14 Wednesday, July 12, 1995
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16 The Commission met in open session, pursuant to
17 notice, at 10:00 a.m., Shirley A. Jackson, Chairman,
18 presiding.

19 COMMISSIONERS PRESENT:

20 SHIRLEY A. JACKSON, Chairman of the Commission
21 KENNETH C. ROGERS, Commissioner
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1 STAFF SEATED AT THE COMMISSION TABLE:

2 JOHN C. HOYLE, Secretary of the Commission

3 KAREN D. CYR, General Counsel

4 PRESENTERS:

5 JAMES TAYLOR, EDO

6 JAMES MILHOAN, Deputy Executive Director for NRR,
7 Regions and RES

8 WILLIAM RUSSELL, Director, NRR

9 FRED HEBDON, Director, Project Directorate, II-3,
10 NRR

11 STEWART EBNETER, Region II Administrator

12 JON JOHNSON, Deputy Director, Division of Reactor
13 Projects, Region II

14 JOHNS JAUDON, Deputy Director, Division of Reactor
15 Safety, Region II

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P R O C E E D I N G S

[10:00 a.m.]

CHAIRMAN JACKSON: Good morning everyone. I am pleased to be here in the new era to welcome our staff and to brief the Commission on the status of the licensing of Watts Bar Unit 1 and on the restart of Browns Ferry Unit 3.

Both, as we all know, are TVA plants which I recently visited, which allowed me to obtain some perspective on the problems that in 1995 led TVA to shut down all of its operating plants and to delay licensing activity on plants then under construction.

The problems at Watts Bar related to construction quality and quality assurance as well as aspects of TVA's overall management of its nuclear program.

Since then TVA has undertaken extensive actions to correct the problems. I know that the staff is preparing an assessment of the various activities. In fact, there have been a number of interim reports of the activities that TVA as well what the staff have performed at Watts Bar. The objective of that assessment is to determine the operational readiness of the plant and that construction quality is being reevaluated to assure that inspection requirements for the construction program have been satisfied.

TVA submitted its plan to return Browns Ferry Unit 3 to service in 1991. The TVA proposed to implement the

1 same NRC approved program that it had used for Unit 2 with
2 some changes to reflect lessons learned from Unit 2.

3 The staff, as I understand it, accepted TVA's
4 proposal. As we know, Browns Ferry Unit 2 was returned to
5 service in 1991.

6 Completion of the outstanding items for Unit 3,
7 such as corrective action programs and special programs,
8 appear, as I understand it, to be on schedule. If the
9 schedule is maintained, TVA hopes to load fuel at Unit 3
10 later this year.

11 I further understand that the restart activities
12 are being monitored by an NRC restart panel comprised of
13 personnel from Headquarters and Region II.

14 I understand that copies of the viewgraphs for
15 today's presentation are available at the entrances to this
16 room.

17 Commissioner Rogers, do you have any comments?

18 COMMISSIONER ROGERS: Just one point. If you
19 could in your remarks, whenever you find it convenient to do
20 so, address the question of any specific issues that were
21 raised ten years ago or so. Whenever it was that the
22 decision was made to shut down and start corrective action,
23 to what extent any specific items that were on a list or
24 lists at that time have again been reviewed and taken care
25 of.

1 I know you have a very extensive inspection
2 program, and so on and so forth, but I know also that in the
3 long time that has ensued that it is possible to sort of
4 treat this as a new problem to be looked at or a new system
5 to be looked at. I am interested to what extent you have
6 been able to go back and look at any specifics that turned
7 up in the past to make sure that they are covered in an
8 explicit way.

9 That's my only question.

10 CHAIRMAN JACKSON: Mr. Taylor.

11 MR. TAYLOR: Good morning.

12 With me at the table, to my right is Jim Milhoan,
13 my deputy, and Bill Russell, Director of NRR. To his right,
14 Fred Hebdon, Projector Director, Division of Reactor
15 Projects in NRR, which has responsibility for TVA.

16 To my left, Stewart Ebnetter, Regional
17 Administrator, Region II. Next to him, Jon Johnson, who is
18 Deputy Director, Division of Reactor Projects in Region II,
19 and Johns Jaudon, Deputy Director, Division of Reactor
20 Safety in Region II. I believe Johns has been detailed to
21 the Watts Bar project since March of 1994.

22 If the Commission will bear with us, I will
23 briefly discuss the history of TVA's nuclear program
24 following its shutdown in 1985.

25 Poor safety performance in 1985 led TVA to shut

1 down its Browns Ferry units by March of that year and shut
2 down its Sequoyah units in August of that same year. Later,
3 in April 1986, emerging construction issues caused TVA to
4 withdraw its certification when Watts Bar Unit 1 was ready
5 for a fuel load license.

6 In September of that year NRC issued its
7 systematic assessment of licensee performance report to TVA.
8 In the letter forwarding that SALP report NRC informed TVA
9 that it demonstrated ineffective management in many areas of
10 its nuclear programs.

11 NRC identified three general areas of concern for
12 which we asked TVA to address specific corrective actions in
13 its response to us. The three areas were TVA's programmatic
14 and management deficiencies, plant-specific performance
15 deficiencies at Browns Ferry, Sequoyah and the Watts Bar
16 sites, and a lack of confidence in work that had been
17 performed, and this lack of confidence had been expressed to
18 NRC by TVA employees.

19 Pursuant to 10 CFR 5050(4)(f) and a letter dated
20 September 17, 1985, signed by the then EDO, as I recall, we
21 asked TVA to furnish us under oath or affirmation
22 information about its plans for correcting its problems in
23 order for us to determine whether their license should be
24 modified or suspended or not or an application denied.

25 TVA's response was a comprehensive plan consisting

1 of a corporate nuclear performance plan -- that happened to
2 be Volume 1 -- and then site-specific nuclear performance
3 plans as Volumes 2, 3 and 4 covering the three sites.

4 We reviewed the plans and subsequent revisions and
5 found them to be acceptable. The plans were comprehensive
6 and if implemented thoroughly should have addressed the
7 identified problems. However, further problems delayed all
8 units.

9 Because Sequoyah's problems were not of the same
10 magnitude as Browns Ferry, TVA elected to focus its efforts
11 to the restart of its Sequoyah stations as its first
12 priority. Corrective actions taken by TVA over the years
13 have resulted in the restart of Sequoyah Unit 2 in May 1988,
14 Sequoyah Unit 1 in November of 1988, and Browns Ferry Unit 2
15 in May 1991.

16 I hope those dates are right, Stew.

17 As you will hear, improvements have also been
18 noted in the quality of Watts Bar construction. Browns
19 Ferry Unit 3 has remained shut down pending satisfactory
20 modifications and NRC approval to restart.

21 Stew will explain to you the process and the
22 guidelines that the staff will use to determine whether a
23 shut down problem plant is ready to restart. He will be
24 followed by Jon Johnson, who will discuss the current status
25 of Browns Ferry Unit 3 completion and the projections for

1 restart.

2 TVA under its Watts Bar nuclear performance plan
3 has implemented extensive actions to complete construction
4 and prepare to operate Unit 1. Johns Jaudon will discuss
5 the current status of construction and the ongoing
6 activities of Watts Bar Unit 1.

7 Fred Hebdon will then discuss the current
8 licensing status and then, in closing, Bill Russell will
9 conclude by providing an overall assessment of the status of
10 TVA and the readiness of Watts Bar Unit 1 to receive a fuel
11 load license.

12 I will now ask Stew Ebnetter to begin.

13 MR. EBNETER: Good morning, Chairman Jackson,
14 Commissioner Rogers.

15 The guidelines that the staff uses for approving
16 the restart of a nuclear power reactor that possesses an
17 operating license and has been shut down either voluntarily
18 or involuntarily as a result of a significant event, complex
19 hardware issue or serious management deficiency are
20 delineated in the Inspection Manual Chapter 0350 entitled
21 Staff Guidelines for Restart.

22 In these shutdown cases the licensee will have
23 identified by a root cause analysis a set of corrective
24 actions that must be completed to bring the plant into
25 conformance with the regulatory requirements. Using the

1 licensee analysis and the NRC findings, the NRC staff
2 develops a checklist and inspection plan to formulate a
3 plant-specific restart criteria and an inspection plan that
4 must be met before the restart will be concurred in by the
5 NRC.

6 The objective of the guidelines is to assure a
7 consistent approach to defining restart criteria and provide
8 an objective measure of restart readiness.

9 In addition to the consistency of approach, the
10 manual chapter provides for coordination of the various
11 restart interfaces, the primarily one being between the
12 regional office and the Office of Nuclear Reactor
13 Regulation, or NRR. This assures a consistent and unified
14 NRC position on all issues and decisions.

15 A significant feature of the guidelines is the
16 utilization of the NRC restart panel to oversee the restart
17 effort. This NRC panel is composed of regional and NRR
18 managers plus the senior resident inspector and the
19 licensing project manager. The panel provides an oversight
20 function of the technical aspects of the restart and serves
21 in an advisory capacity to the regional administrator and
22 the director of NRR.

23 The panel develops a restart action plan, and this
24 restart action plan incorporates the licensee's plan, the
25 criteria that were specified in either the confirmatory

1 action letter or an order, inspection requirements from the
2 program itself. The end result of that is what we call a
3 case-specific checklist.

4 To perform the oversight function, the panel meets
5 periodically, typically on a monthly basis, with the
6 licensee and the NRC staff to review the status of the
7 recovery and restart efforts. The restart plan may be
8 modified as a result of these meetings. That is dependent
9 primarily on whether we identify emerging work or discovery
10 of additional problems.

11 The media is invited to the oversight meetings and
12 they typically attend. These meetings are also open to the
13 public for observation.

14 The action plan includes in it the need to
15 coordinate with other government agencies. It defines the
16 local, state and federal agencies and the NRC office
17 responsible for this coordination, and we do review the
18 completion of this interface coordination prior to restart.

19 During the recovery period the Commission is kept
20 informed on a regular basis either through Commission
21 papers, EDO highlights or Commission briefings.

22 All steps of this process are documented. The
23 charter for the restart panel is documented; the CAL is
24 documented, the order; the action plan is documented; and
25 all of the inspections and license reviews that we do in

1 accordance with that plan are documented. This provides a
2 complete auditable trail for anyone who is interested in
3 checking the actions that the NRC has taken.

4 Upon satisfactory completion of the restart plan
5 by the licensee and NRC verification of that completion, the
6 restart panel will provide a recommendation to the regional
7 administrator and the director of NRR for approval to
8 restart. This is also coordinated with the EDO's office.

9 In cases of a watch list category 3 plant,
10 Commission approval is also required for restart. For
11 Commission approval, we normally would have a meeting with
12 the Commission approximately one month before the restart
13 date.

14 Browns Ferry meets the requirements for the
15 application of MC 0350. Browns Ferry was voluntarily shut
16 down in the spring of 1985 and was subsequently requested by
17 the NRC to remain shut down until the NRC concurred in any
18 unit restart. This is the letter that Mr. Taylor referenced
19 in his discussion.

20 Browns Ferry was placed on the watch list as a
21 category 3 plant in October of 1986. TVA developed a
22 restart plan for the plant and is currently pursuing that
23 plan. A joint Region II and NRR restart panel has been
24 established. Jon Johnson is the chair of that panel. That
25 plan has met the requirements of manual chapter 0350. Jon

1 Johnson will discuss with you the application and the status
2 of the Browns Ferry plan.

3 MR. JOHNSON: Chairman Jackson, Commissioner
4 Rogers, I will discuss the status of Browns Ferry Unit 3.

5 Browns Ferry control room operators are licensed
6 on all three units. Currently there are six shift crews
7 which are rotated through assignments in both control rooms
8 in all three units. Two senior reactor operators and two
9 unit operators are assigned to the Unit 3 control room
10 during most shifts.

11 TVA management is establishing a second shift
12 supervisor work station in the Unit 3 control room and it is
13 expected that the shift supervisor will divide his time
14 between the two control rooms.

15 Recent emergency preparedness drill scenarios have
16 included simulation of Unit 3 at power. Operations of
17 shared systems such as service water and electrical
18 equipment as well as completed plant modifications have
19 routinely been addressed in training.

20 A recent partial loss of offsite power on Unit 3
21 was handled well by the operators and coordination between
22 the control rooms during the recovery was very good.

23 Operations management has also initiated
24 enhancements to operator requalification training to address
25 two-unit operation. Licensing management has plans to visit

1 other multi-unit nuclear facilities to gain additional
2 insight into two-unit operations. TVA is also considering
3 the use of additional shadow managers with dual unit
4 experience to assist the shift supervisors during power
5 ascension testing.

6 The administrative controls applied to the system
7 turnover process are the system pre-operability checklist
8 and the system plan acceptance evaluation. These remain
9 essentially the same as those utilized during the Unit 2
10 restart. The system plan acceptance is an evaluation
11 performed by site engineering to ensure that a system is
12 ready to support the restart test program and return to
13 operation. Engineers review several input databases and
14 system design basis information to ensure that all required
15 program work has been addressed for the system. Two thirds
16 of the design reviews are complete.

17 The pre-operability check process provides a
18 systematic method for evaluating and recording the
19 completion status of items affecting a system. Phase I
20 addresses return to service testing and Phase II addresses
21 return to operations and includes detailed walk-downs of the
22 system. Approximately one third of the plant systems have
23 been turned over to operations.

24 The resident inspectors have monitored a sampling
25 of the implementation of these processes since early in the

1 recovery schedule.

2 The standby liquid control system, the initial
3 safety-related system, and the emergency cooling water
4 system, a common system with risk significance in the multi-
5 unit PRA, were reviewed in detail. Several attention to
6 detail problems were identified early in these reviews. TVA
7 management promptly initiated changes which have improved
8 the quality of system walk-downs and the details of design
9 reviews.

10 When recovery is complete, programs and procedures
11 for Unit 3 will be substantially the same as Unit 2. The
12 units will operate under the same lines of command, with
13 responsibilities for activities such as maintenance,
14 engineering and radiological controls in a single
15 organization. Some programs such as fire protection will be
16 more user friendly after the Unit 3 program is implemented.

17 Operational procedure upgrades are being
18 implemented as an integral part of the system recovery
19 process. As appropriate, procedures are being patterned
20 after the existing Unit 2 procedures.

21 Following a licensing self-assessment in April,
22 TVA management increased resources to support writing
23 instrument and control procedures. Currently overall
24 procedure upgrades are on schedule.

25 As an operational readiness review, TVA line

1 managers have been routinely performing a self-evaluation of
2 specific Unit 3 recovery activities. Attributes for key
3 activities are monitored against established performance
4 criteria and reports are given in a color coded format which
5 quickly shows the status of the activity.

6 Additionally, the licensee is tracking the
7 maintenance backlog on systems that have been turned over
8 and is issuing periodic status reports.

9 An experienced Browns Ferry manager has been
10 dedicated to oversee the Unit 3 quality assurance effort. A
11 list of potential problem areas was developed by TVA based
12 on Unit 2 lessons learned and review of other potential
13 vulnerabilities, including Watts Bar issues. These areas
14 were incorporated into the Unit 3 QA plan reviews.

15 Initial audits for Unit 3 activities were
16 sufficiently detailed and have identified deficiencies such
17 as an electrical splice problem and a potential equipment
18 qualification weakness.

19 An independent corporate assessment of the Unit 3
20 QA plan was completed in May and noted several strengths and
21 made some recommendations. The enhancements primarily
22 involve formalization of multi-unit operations, training and
23 supervision.

24 Phase I of the licensee's operational readiness
25 review was recently completed. The team, which included

1 plant management experience, concluded that progress is
2 being made which should support an October fuel load and had
3 positive comments regarding the overall attitude of workers
4 and management.

5 Phase II is scheduled for September.

6 Operational readiness reviews are also planned by
7 INPO at the end of August and by the Nuclear Safety Review
8 Board in the beginning of October.

9 In addition to the NRC resident and special region
10 based inspections following up on specific recovery actions,
11 an NRR led operational readiness assessment team inspection
12 is scheduled to be conducted in October.

13 Slide 3, please.

14 COMMISSIONER ROGERS: Before you leave the
15 operations, I have one question. Roughly how much simulator
16 training will the operators have had that are going to be
17 involved in the startup operations and to what extent have
18 they actually been engaged in startup operations rather than
19 dealing with these accident scenarios which I think you were
20 talking about?

21 MR. JOHNSON: The operators that will be starting
22 up Unit 3 are currently licensed on all three units and have
23 been conducting regular periodic requalification training.
24 For the startup of Unit 2, TVA specifically took those
25 operators through the routine startup process, something

1 that they had not done in the past.

2 For the current plans, I know that they are
3 reviewing their simulator training. I can't answer
4 specifically what specific plans in the power ascension
5 testing they have to date, but that is an area that we will
6 be looking at and we will be inspecting and observing that.

7 MR. EBNETER: They start the plant up in
8 accordance with what they call GOIs, general operating
9 instructions, and their staff has been run through the
10 simulator and gone through all those GOIs.

11 CHAIRMAN JACKSON: How comfortable are you that
12 the restart plans for Unit 3 will not negatively impact
13 operations of Unit 2? What are you doing specifically to
14 gain comfort, as it were?

15 MR. JOHNSON: As an example of what we have done,
16 we have inspected and observed their tested of the emergency
17 cooling water systems. This is a common system that
18 provides cooling to both Unit 2 and Unit 3. We reviewed
19 their procedures and conducted observations of their walk-
20 down when the licensee was preparing for testing for that
21 system and also conducting the testing in order to assure
22 that it did not adversely affect Unit 2.

23 CHAIRMAN JACKSON: What about from an operational
24 perspective? This is a shared equipment system issue. You
25 mentioned that there would be an extra shift supervisor and

1 that person would be shared, for instance, between units 2
2 and 3. I guess I'm interested in more conduct of operations
3 issues as opposed to equipment issues per se.

4 MR. JOHNSON: We have discussed the conduct of
5 operational issues with the operations management and plant
6 management at Browns Ferry and they have assigned an extra
7 senior reactor operator to the Unit 3 control room. They
8 have one shift supervisor for the site and he up until now
9 has primarily been located in the Unit 2 control room. He
10 is providing more interface and coordination with Unit 3 and
11 Unit 2 operations.

12 The licensee has also identified equipment in the
13 Unit 3 control room that could adversely affect Unit 2 and
14 has specifically paid attention to those annunciators and
15 control switches and so forth in the Unit 3 control room
16 that could adversely affect Unit 2.

17 MR. RUSSELL: Dr. Jackson, if I could just add one
18 thought. It is difficult to reach conclusions about
19 readiness for operation with the facility shut down. In
20 addition to what has been described with the operational
21 readiness team inspection, we will be closely monitoring
22 power ascension and operations, and we do have plans with
23 the region to oversee those activities to ensure that there
24 is a smooth transition from a construction phase, completion
25 of corrective action phase in the operation for Unit 3.

1 This is something we have looked at carefully.

2 For example, the handling of the Unit 2 refueling
3 outage when they did a lot of the tie-in work to Unit 3 in
4 preparation is something that has been high on the priority
5 for the licensee to address as well. We are still
6 developing information. We will be observing and
7 monitoring, but it is going to take time to gain that
8 confidence.

9 So it's a combination of inspection activities
10 during shutdown of Unit 3 plus observation. That's why Jon
11 had to refer principally to testing activities that impacted
12 the two. But we do have plans to closely monitor the power
13 ascension and startup of the unit.

14 MR. JOHNSON: Slide 3, please.

15 [Slide.]

16 MR. JOHNSON: When the Browns Ferry units were
17 shut down in 1985 they had a substantial backlog of specific
18 regulatory issues requiring resolution. Prior to the
19 restart of Unit 3 TVA will complete modifications necessary
20 to resolve these long-term issues.

21 General industry issues have also been raised
22 since the shutdown and will also be addressed consistent
23 with methods and schedules approved by NRR.

24 NRC inspections have shown the quality of TVA's
25 engineering and construction activities to be good.

1 Approximately 95 percent of the design work has been
2 completed. Thirty-two design change notices remain to be
3 issued out of a total of 617.

4 The majority of the bulk construction work is
5 complete. This includes large and small bore piping
6 supports, conduit, conduit supports, and installation of new
7 cable. Construction work is approximately 75 percent
8 complete.

9 At Browns Ferry area turnovers primarily address
10 housekeeping, material conditions and labeling. The
11 turnovers are being completed in a thorough manner, which
12 has resulted in excellent material condition. Approximately
13 one fourth of the areas have been turned over to operations.

14 Testing of several systems has begun. However,
15 the intensity of testing is expected to increase to a peak
16 in August. A system test specification is developed for
17 each system, which basically is a compilation of required
18 test inputs from different sources.

19 The restart test program is based on the safe
20 shutdown analysis and results of the design baseline
21 verification program. This is reviewed and approved by the
22 joint test group, a subcommittee of the plant operating
23 review committee.

24 Post-modification testing and post-maintenance
25 testing are dependent on the work performed on the system.

1 Surveillance testing for operability will be completed
2 separately after system turnover.

3 During the Unit 2 recovery much redundancy
4 occurred during system testing. For the Unit 3 restart the
5 licensee is trying to perform the testing in a more
6 integrated approach.

7 NRC inspectors have noted that the current
8 licensee plans for restart test program and other system
9 recovery actions appear to have many activities scheduled
10 for the month of August. In addition to complex electrical
11 system testing, several plant systems are scheduled for
12 testing and maintenance. Currently the licensee is
13 reviewing this closely to assure that the schedule is
14 reasonable.

15 Next slide, please.

16 COMMISSIONER ROGERS: Before you leave that, I'm
17 still puzzled by your 75 percent of construction complete
18 figure. Isn't this a rather late date to be at that point?
19 What is the 25 percent that is not complete? What kinds of
20 things?

21 MR. JOHNSON: The majority of the equipment is
22 installed. The percentages are primarily final reviews of
23 packages to make sure that the inspections have been
24 completed and the signatures have been made and the TVA
25 construction group is monitoring the status and various

1 methods. I think we are assured that a large amount of that
2 construction activity is completed.

3 CHAIRMAN JACKSON: Are you also assured that the
4 procedures have been updated to reflect any equipment or
5 changes in the plant?

6 MR. JOHNSON: The procedures are not completed
7 yet, but the operational procedures are being updated as the
8 systems are turned over. We are reviewing those. When we
9 do a system walk-down we are reviewing the procedures to
10 make sure they have been updated to operate the systems
11 properly, and also we will watch the testing and review the
12 testing procedures to make sure that they have been updated
13 also.

14 CHAIRMAN JACKSON: Is there any training to those
15 procedures that is going on in critical areas and are you
16 also making observations of those?

17 MR. JOHNSON: We have observed some training in
18 the simulator. Training will need to be conducted
19 specifically on any particular procedures that are different
20 between Unit 3 and Unit 2. As an example, in the fire
21 protection area the Unit 3 procedures we expect to be
22 somewhat different than the Unit 2 procedures. They may
23 have less operator actions, as an example.

24 We have been observing training in the simulator
25 and we will also conduct additional observation of this

1 training as it gets closer to startup.

2 COMMISSIONER ROGERS: Is this simulator fully
3 congruent to the actual plant?

4 MR. JOHNSON: The Browns Ferry simulator is mainly
5 patterned after Unit 2. The Unit 2 and Unit 1 control room
6 are together, and in that control room they have the major
7 electrical controls for the system switchyard. The Unit 3
8 control room is separate. For primary plant components the
9 core mimics the core cooling systems, and so forth. Those
10 are all primarily the same between Unit 3 and Unit 2.
11 However, the simulator would have a little bit different
12 mimicking because they have the extra switchyard
13 distribution system.

14 MR. EBNETER: Let me comment on the completion of
15 construction. Actual construction and design are 95 percent
16 or more done. The 75 percent is a general figure for
17 component turnover testing.

18 The actual hardware installation and design are 95
19 percent or more done. The primary effort is in the
20 electrical cable. There is still some cabling to be run.
21 That's the pacing item, I believe. Some conduit supports,
22 some tray supports and some small bore supports, but
23 generally it's pretty high.

24 The only design aspect that is lagging is going
25 through the testing they have to make some design changes.

1 Those will be incorporated, but that is almost finished
2 also.

3 MR. JOHNSON: Slide 4, please.

4 [Slide.]

5 MR. JOHNSON: To summarize the Unit 3 schedule,
6 TVA plans to conduct readiness assessments in September.

7 Fuel load is scheduled for mid-October.

8 And criticality is scheduled for early December.

9 Power ascension testing is scheduled to be
10 completed in February.

11 This concludes my comments. If there are any
12 additional questions on Browns Ferry.

13 CHAIRMAN JACKSON: Are there any critical path
14 items from our perspective that would impact the ability to
15 complete all aspects of the 0350 program relative to the
16 projected fuel load date?

17 MR. JOHNSON: I don't see any problems with the
18 critical path schedule. As I pointed out, the major
19 activities that look ahead are a lot of testing that is
20 scheduled for a relatively short amount of time. We are
21 prepared to observe those activities. We have looked at our
22 other inspection resources in the region to assist the
23 resident inspectors to provide adequate coverage to watch
24 all the testing that is necessary.

25 I think TVA is also looking at their schedule to

1 see if it's reasonable. They are trying to basically even
2 it out a little bit to spread out some of the testing
3 activity so not so many come together at the same time.

4 CHAIRMAN JACKSON: Commissioner Rogers, do you
5 have any more questions?

6 COMMISSIONER ROGERS: No questions.

7 CHAIRMAN JACKSON: Mr. Johnson.

8 MR. JOHNSON: Mr. Jaudon will now discuss the
9 status of Watts Bar.

10 MR. JAUDON: Chairman Jackson, Commissioner
11 Rogers, I shall begin the briefing concerning Watts Bar Unit
12 2 with a discussion of our inspections and results.

13 May I have slide 5, please?

14 [Slide.]

15 MR. JAUDON: Most construction inspection activity
16 in the 1990s has been focused on work performed to correct
17 known problems. Much of our inspection of this work was
18 accomplished under temporary instructions, or TIs. There is
19 a TI for each corrective action plan, or CAP, and for each
20 special program, or SP.

21 In addition to inspections accomplished under TIs,
22 we have undertaken a comprehensive review of all inspection
23 activities at Watts Bar 1 to confirm the completion of NRC
24 Inspection Manual Chapter 2512, the construction inspection
25 program.

1 The 2512 reconstitution effort has been
2 accomplished over the last year using experienced
3 inspectors. The inspectors have reviewed individual
4 inspection requirements from the construction inspection
5 procedures and determined if the inspection requirement was
6 completed and documented in an inspection report.

7 The inspectors used an electronic database which
8 included full text of all Watts Bar inspection reports to
9 facilitate their review. The reports were divided into
10 post-1985 and pre-1986 bins.

11 The intent was to use post-1985 inspection
12 activity for the reconstitution, if possible. This turned
13 out to be more than three fourths of the time.

14 When post-1985 inspection reports did not confirm
15 completion of required inspections, our methodology was to
16 inspect, if that was feasible, to do record reviews if
17 inspection was not feasible, and as a last resort to rely on
18 pre-1986 inspections. After confirming that allegations did
19 not impact the use of this data, reliance on pre-1986
20 inspections required management review and concurrence.

21 An example of the use of pre-1986 inspection
22 report data is the soils and foundations area. An example
23 of the use of inspections was the area of concrete
24 structures.

25 Although installation of concrete structures had

1 occurred pre-1986, we shall be able to inspect this area.
2 NRR has developed inspection techniques to assess the
3 condition of concrete structures that were 20 to 25 years
4 old. This was done in order to support licensing
5 extensions.

6 CHAIRMAN JACKSON: Can you elaborate a little more
7 on that?

8 MR. JAUDON: The NRR team goes in and looks at the
9 concrete and looks for deterioration and damage. They have
10 taken this methodology and tried it at Beaver Valley -- I'm
11 not sure where else -- to see if it works and make an
12 assessment. Since the concrete structures are 20 to 25
13 years old at Watts Bar, we had the methodology in place.
14 That team is going to start on site next week.

15 CHAIRMAN JACKSON: Mr. Russell.

16 MR. RUSSELL: Let me comment programmatically what
17 we have been doing. As a part of our activities looking at
18 license renewal we started several years ago to develop
19 inspection techniques that could be used at operating
20 reactors to go in and be able to look at the category 1
21 structures, particularly intake structures where you may
22 have a water interface because it's partially submerged,
23 containment structures, and others.

24 We have done about five of these inspections. The
25 lessons learned from those inspections along with some

1 industry reports that were generated in support of license
2 renewal addressing structural issues were used for guidance.

3 Recognizing that these structures were completed
4 in the range of 20 to 15 years ago, we are looking at both
5 the records, that is, the testing that may have been done on
6 concrete strengths and other quality records.

7 As Johns said, if there were allegations that
8 impact those, we did the follow-up on the allegations to
9 close out the techniques issues associated with allegations.
10 So we are reasonably confident as it relates to most of the
11 technical information.

12 We wanted to provide additional assurance,
13 however. So we chose to use this approach with the team
14 inspection -- that team inspection is ongoing now -- to
15 physically do observations of the structures, look for signs
16 of any degradation that may be associated with exposure to
17 elements or wear and to make judgments as to whether that
18 degradation would or would not affect the capability of the
19 structure to perform its safety function.

20 That is the scope of what we are doing and it is
21 unique because of the long period of time that this facility
22 was under construction.

23 MR. JAUDON: The 2512 reconstitution effort is
24 almost complete. The results to date indicate the
25 construction inspection program was for the most part re-

1 completed by post-1985 inspections.

2 The completion of each reconstitution segment is
3 being documented in inspection reports. We plan to issue a
4 NUREG describing the reconstitution process, summarizing the
5 results in detail and providing data sheets which will
6 detail the basis for our conclusions.

7 Since construction work is ongoing, we are
8 continuing inspections. Construction work today is
9 primarily to finish systems and spaces for turnover to
10 operations and to complete the CAPs and SPs and to address
11 other conditions adverse to quality identified over the
12 years.

13 TVA projections indicate that the construction
14 craft manning will decrease significantly from the end of
15 last month to August 1.

16 TVA decided early on to redo essentially their
17 entire pre-operational test program. Pre-operational tests
18 provide a means of demonstrating that systems and components
19 and in some instances structures can perform their design-
20 basis functions.

21 TVA performed hot functional testing during April,
22 May and June of 1994. Hot functional testing is a series of
23 tests during which the reactor coolant system is raised to
24 normal operating temperature and pressure. This is done by
25 running the coolant pumps. A few major systems and

1 equipments did not perform adequately and will be retested
2 during the second hot functional test called HFT-2. This is
3 scheduled for this summer.

4 The most significant HFT-1 problems were the
5 auxiliary feedwater system and the residual heat removal
6 system.

7 CHAIRMAN JACKSON: I take it that the scope of
8 this second hot functional test is broader than a re-look at
9 the systems that were problematic the first time.

10 MR. JAUDON: It is everything on which they did
11 not have complete satisfactory data. The original schedule
12 called for about two months of testing at the various
13 plateaus, and a lot of that testing was satisfactory. This
14 test scope will run about four weeks.

15 CHAIRMAN JACKSON: Let me ask you a few other
16 questions about this. Are there specific acceptance
17 criteria that are established for the hot functional testing
18 relative to specific equipment groups?

19 MR. JAUDON: Yes, there are specific test
20 procedures with specific acceptance criteria. If they meet
21 the acceptance criteria, that is still reviewed by the joint
22 test group and accepted after the test is over.

23 If there is a problem with anything during the
24 test, it is documented on what is called a test efficiency
25 notice. That is a formal record. That gets resolved

1 sometimes as a retest, sometimes as accept as is based on
2 engineering evaluation of it. Then it goes back to the
3 joint test group for review and final acceptance or
4 rejection. They can reject things and require retest or
5 modification.

6 CHAIRMAN JACKSON: My understanding is that there
7 actually would be four separate groups providing some
8 oversight of this second hot functional test. Is that
9 correct?

10 MR. RUSSELL: Johns, I think Dr. Jackson is
11 addressing the issues of the operational aspects rather than
12 the hardware aspects.

13 CHAIRMAN JACKSON: That's right.

14 MR. RUSSELL: If you could address what we are
15 going to be doing in the full dress rehearsal aspects and
16 looking at operational readiness.

17 MR. RUSSELL: We will, of course, monitor the
18 test. We have people that watch just the testing. For
19 monitoring the operations and the full dress rehearsal --
20 this will be a full dress rehearsal -- they are going to
21 pretend like they have fuel in the core even though they
22 won't, and they are going to follow the tech specs as far as
23 they are applicable, and their operating procedures.

24 We will have the residents with some assistance
25 watching that on a round the clock basis until the NRR-led

1 operational readiness assessment team, or ORAT, gets on
2 board. When they come on board the residents will back off
3 so we don't overload the system too much. The ORAT will
4 monitor their performance. When they are not there the
5 residents will reassume the full-time looking.

6 CHAIRMAN JACKSON: How will the insights from
7 these two separate oversight activities be integrated?

8 MR. JAUDON: We will verbally brief the licensee
9 so the licensee can make on-the-spot corrections. They will
10 publish separate reports. It is our job to integrate the
11 results and make sure we think the licensee or TVA has
12 integrated results.

13 In addition, TVA has an extensive assessment of
14 their own running with both line people and with quality
15 assurance monitoring their performance. We believe it is
16 appropriate that they look at their performance also and not
17 depend upon us to tell them it's right.

18 MR. EBNETER: The integration will occur when the
19 findings of the ORAT group, which is run out of NRR -- their
20 findings will become part of the inspection open item system
21 and follow-up actions, and that's controlled out of the
22 region. If we need additional help to close those out and
23 integrate them, then we will get additional help out of NRR.
24 But the general integration is in the regional inspection
25 program.

1 MR. JAUDON: After the initial hot functional
2 testing, TVA conducted the combined integrated leak rate
3 test of the containment. This involved pressurizing the
4 containment and measuring the pressure drop over several
5 hours in order to determine the leak rate. This testing was
6 completed successfully.

7 In the fall of 1994 the integrated safeguards test
8 sequence was completed, also successfully. This is a series
9 of tests that measured plant response during simulated
10 events, including loss of offsite power both with and
11 without simulated loss of coolant accidents.

12 A few systems which are not necessary for HFT will
13 be completed and tested after HFT but before fuel load.
14 Examples include the high pressure fire protection system
15 and the radiation monitoring systems.

16 In addition to pre-operational testing of
17 hardware, we perform programmatic pre-operational
18 inspections to look at the readiness of the plant staff and
19 their programs to support licensed operation. These
20 inspections are performed by residents and by regional and
21 headquarters inspectors.

22 Specific programs, for example, staff
23 qualifications and training, and specific programs such as
24 operational quality assurance are inspected in order to
25 provide information used to make the judgment on the

1 readiness of the organization to operate the facility.

2 We also inspect operating experience feedback
3 programs to determine their effectiveness. NRC has issued
4 information notices, bulletins and generic letters to inform
5 licensees of problems which may affect their facilities.

6 NRR has also issued inspection requirements and
7 temporary instructions to follow up on potentially generic
8 operating experience. These sources of operating experience
9 have been systematically reviewed and where appropriate
10 inspections have been performed. These inspections are not
11 yet complete, but to date they have not revealed any
12 significant deficiencies.

13 Additionally, we reviewed operating experience
14 from other recent plant start-ups and factored the lessons
15 learned into our inspection activities for Watts Bar.

16 NRR will perform the independent operational
17 readiness assessment team, as I said before. They were on
18 board in November 1994 and watched the integrated safeguard
19 testing. The ORATs are staffed with inspectors from NRR and
20 sometimes other regions. So they give a truly independent
21 check.

22 HFT-2 will be conducted as a full dress rehearsal.
23 TVA has agreed to conduct the operational activities as if
24 fuel were loaded in the core.

25 In advance of HFT-2 operational readiness

1 procedures have been completed and reviewed to identify
2 specific steps which will be simulated due to the fuel not
3 being loaded and identify those steps which will be
4 performed. The scope of this review included plant startup
5 and shutdown, testing, maintenance and surveillance, and
6 facility technical specifications.

7 Agreements have been reached in advance of HFT-2
8 on the scope of operational activities to be performed and
9 inspected.

10 Startup and power ascension testing. The
11 procedures used for startup and power ascension testing are
12 reviewed prior to licensing. We have sampled the test
13 procedures being prepared for Watts Bar for startup and
14 power ascension. They are generally good. We have not
15 found any problems similar to those which plagued the early
16 drafts of pre-operational test procedures.

17 Although we have completed the minimum pre-test
18 review of these procedures, we shall conduct additional
19 inspections prior to the conduct of specific tests.

20 May I have slide 6, please?

21 [Slide.]

22 MR. JAUDON: Over the years staff has dealt with
23 hundreds of allegations concerning Watts Bar. However, we
24 have received only 21 Watts Bar allegations to date in 1995.
25 There are 40 allegations open at Watts Bar. Of the 40 open

1 allegations we have completed the technical inspections on
2 all but 13. The remainder are in the closure process or are
3 awaiting action by the NRC's Office of Investigation or by
4 the Department of Labor.

5 We recognize the possibility that there may be
6 additional allegations concerning Watts Bar. We will follow
7 agency procedures for handling late filed allegations. A
8 senior NRC and TVA management meeting is planned following
9 HFT-2 to review the status of TVA investigations and open
10 employee concerns.

11 We have also inspected the employee concern
12 program at Watts Bar periodically and we shall continue to
13 inspect it before licensing to monitor its performance.

14 We continue to inspect Watts Bar at an
15 unprecedented level. Our inspections indicate that TVA
16 performance on the site has been generally good since the
17 fall of 1994. At that time TVA made significant management
18 program completion and quality assurance changes to assure
19 adequate completion of corrective actions.

20 The problems which occurred in the summer and fall
21 of 1994 have not been repeated and good results have been
22 sustained throughout the period of heavy construction
23 completion and testing activity.

24 COMMISSIONER ROGERS: What were those problems?

25 MR. JAUDON: The problems were that some work,

1 primarily on open items in response to our inspection
2 findings -- they would provide a package showing how the
3 work had been done. When we went out and inspected the work
4 in the field sometimes we would find that the work had been
5 undone because they hadn't protected it, or the same problem
6 was recurring and therefore their corrective actions were
7 ineffective, or they had failed to put a fix in place that
8 was good.

9 MR. EBNETER: Primarily centered around weak
10 quality assurance oversight of the activities.

11 COMMISSIONER ROGERS: Has TVA dealt with that in
12 an organizational way?

13 MR. EBNETER: Yes, they have. They reassigned a
14 proactive quality assurance manager from the Chattanooga
15 office to the site full time. He's still there. He
16 instituted much more stringent controls over quality
17 reporting requirements. As Johns said, we have seen
18 significant improvement in that activity since they have put
19 the attention on it.

20 MR. RUSSELL: I think it's also important to note
21 that our concerns were not only with the quality
22 organization not catching these issues but the line
23 organization that indicated that these things had been
24 completed satisfactorily, gone through the quality reviews
25 and submitted to NRC. We then found they were not.

1 We had a senior management meeting with them here.
2 Jim, Stew and I participated in that meeting, and we
3 reviewed each of the instances where they had characterized
4 work as being complete that was later found to not be
5 complete. They did an extensive root cause of why that
6 occurred, and they have made changes in their work closure
7 process, the line management oversight of those activities,
8 as well as reviews by the quality organization.

9 We have asked them to keep track of the quality of
10 packages. As they are submitted from the line to the
11 quality organization, what did the quality organization
12 find, what kinds of issues were there. Then we have also
13 been following up with our own independent inspections and
14 reviews.

15 As was stated, since the fall we have found that
16 there has been a marked improvement in quality of closure
17 packages and the completion of work. There is still a lot
18 to be done to complete work. That activity in the fall is
19 one of the reasons that we are doing a separate assessment
20 of quality assurance activities at the site, which Fred
21 Hebdon will address in just a moment.

22 MR. JAUDON: I could add that initially after the
23 meeting in October quality assurance had about 100 percent
24 rejection rate in all packages. I think it was January
25 before we saw another package, but we haven't had a

1 rejection by us since then. QA's rejection of what the line
2 is providing has gone way down. There are very few they
3 reject now.

4 May I have slide 7, please?

5 [Slide.]

6 MR. JAUDON: HFT-2 is scheduled to occur this
7 summer. TVA's start date is July 14, two days from now.

8 TVA is making progress in the completion of
9 systems and plant areas which will not be tested during HFT-
10 2 in order to minimize the time between HFT-2 and fuel load.

11 Their plan calls for maintaining system status and
12 configuration control in accordance with the proposed
13 license conditions and technical specifications following
14 HFT-2. This will ensure that the operational readiness of
15 the staff is maintained at a high level through the fuel
16 load. TVA's schedule calls for six weeks of work after the
17 successful completion of HFT-2 until they reach fuel load.

18 With regard to the corrective action program,
19 corrective action plans, or CAPs, and the special programs,
20 of the original 28 CAPs and SPs there are 15 for which the
21 staff has not completed a closure inspection. All are well
22 beyond the 75 percent completion point and all have been
23 inspected for work in process. Completion of these by TVA
24 also includes the closure of many of the previously
25 identified conditions adverse to quality.

1 While there are no known problems that seriously
2 imperil the schedule for CAPs and SPs, the volume of work to
3 close all of them is large. Closure of the CAPs and SPs and
4 other conditions adverse to quality will mark correction of
5 the deficiencies found in 1985 and afterwards. This coupled
6 with the closeout work to turn over systems and rooms to
7 operations constitutes the work remaining to complete the
8 construction of Watts Bar Unit 1.

9 Turnover from construction to operations has been
10 completed for 124 of the 134 systems required for licensing,
11 and all of the 113 systems needed for HFT-2 have been turned
12 over to operations. Similarly, all but four rooms or spaces
13 needed for HFT-2 have been turned over. However, only about
14 55 percent of the rooms or spaces needed for fuel load have
15 been turned over.

16 The results of NRC inspections can be measured in
17 terms of open items generated. These open items require
18 follow up. As of June 29 there were 177 open items for
19 Watts Bar Unit 1. These consist of violations, deviations,
20 inspector follow-up items and other issues such as
21 construction deficiency reports made by TVA and open TMI
22 items.

23 We do in-process inspections of open items while
24 TVA is working on them and as inspectors are available to do
25 it. And we do closure inspections on all of the open items

1 when TVA completes them. The total has decreased steadily
2 over the last two years. Some of the open items still out
3 there represent long-term construction deficiencies, and
4 their closure is often tied to the completion of a CAP or an
5 SP.

6 I have already discussed the operational readiness
7 inspections which are ongoing. We shall continue to monitor
8 the performance of their operators in the control room and
9 to gauge the quality and timeliness of support provided them
10 by the engineering and maintenance organizations.

11 Also, we shall continue to monitor the
12 effectiveness of the site quality organization in the
13 operations area and the quality standards established and
14 maintained by site management.

15 Successful completion of HFT-2 is the major
16 milestone for judging operational readiness at Watts Bar 1
17 and for licensing.

18 Are there any more questions on the inspection
19 activities?

20 COMMISSIONER ROGERS: Just one question. I'm not
21 sure whether it applies here or not. I know some years ago
22 there was a great concern about the condition of installed
23 cables in some TVA facilities. I don't know how that
24 relates to these particular units, but I wonder if you could
25 say something about our comfort that that is not a problem.

1 This had to do with initial installation, pulling cables
2 through in ways that injured them or potentially injured
3 them, and there was some difficulty in checking this out and
4 knowing how bad the situation was. Where does that stand?

5 MR. JAUDON: There are two CAPs that affect cable
6 and electrical issues. There are many sub-elements in them.
7 A few of the sub-elements are closed. A great deal of the
8 cable in question was replaced initially in order to
9 investigate the problem. I think more problems turned up,
10 which led to a lot of cable replacement. Some problems were
11 discovered along the way with the new cable, which in some
12 instances had to be spliced, and we had problems with the
13 splices.

14 There are still problems in the electrical area.
15 There is currently a lot of corrective action going along
16 which involves the inspection of small cable terminations
17 and connections in the control room and in all the
18 environmentally qualified spaces within the plant.

19 MR. EBNETER: Let me answer two questions. One is
20 that one and the other one you asked at the beginning: Have
21 we seen recurring type problems that existed earlier?

22 I think when the corrective action programs are
23 finished the electrical system will certainly meet our
24 requirements and be sufficient. It has been an ongoing
25 problem, much of it due to inadequate rework and inadequate

1 quality oversight.

2 As Johns said, much of the work that remains to be
3 done is still in the electrical area, cable pulling, splice
4 qualifications. We still have to get qualification data for
5 some of the rework on the splices. So that still is open.

6 We think the fixes now are adequate and will be
7 sufficient for the plant. We still have some additional
8 inspections to do in the environmental qualification,
9 particularly the splices, and we have to do the inspection
10 of the final cable pulls.

11 The other theme that recurs is this one on the
12 quality. It gets better, gets to a marginal level, and then
13 gets better. We think that is fixed now, at least for this
14 phase of construction and transition. We need to make sure
15 that the quality assurance organization that is put in place
16 for operations is adequate, and we have not fully inspected
17 that area yet.

18 MR. JAUDON: Fred Hebdon will now address the
19 status of licensing activities for Watts Bar 1.

20 MR. HEBDON: May I have slide 8, please?

21 [Slide.]

22 MR. HEBDON: The licensing review for Watts Bar
23 was essentially complete in 1985. In February of 1985 TVA
24 certified that Watts Bar was ready for licensing. However,
25 by April of 1986 TVA had concluded that Watts Bar Unit 1 was

1 not ready for licensing and embarked on the extensive
2 program described in the nuclear performance plan.

3 Corrective actions led to reevaluation of numerous
4 previously approved issues, which resulted in 27 amendments
5 to the final safety analysis report since 1990.

6 Slide 9, please.

7 [Slide.]

8 MR. HEBDON: The staff has reviewed these changes
9 and has issued 11 supplements to the safety evaluation
10 report. The staff's review of the FSAR and development of
11 the technical specifications for Unit 1 are nearing
12 completion, although some issues such as fire protection are
13 still under review.

14 Slide 10, please.

15 [Slide.]

16 MR. HEBDON: The final environmental statement for
17 Watts Bar was issued in 1978. In 1994 the staff decided to
18 prepare a supplement to the FES, which was issued for public
19 comment. Comments were addressed and the final supplement
20 issued.

21 In addition, the staff prepared a biological
22 assessment of the impact of operation of Unit 1 on
23 endangered and threatened species. The biological
24 assessment was submitted to the Fish and Wildlife Service
25 and they have issued a biological opinion which concludes

1 that operation of Unit 1 will not jeopardize the continued
2 existence of endangered and threatened species.

3 Slide 11, please.

4 [Slide.]

5 MR. HEBDON: We are in the process of preparing an
6 additional supplement to the SER which will address whether
7 sufficient confidence has been gained for the staff to issue
8 an operating license. This supplement will address past
9 problems at Watts Bar, the effectiveness of TVA's corrective
10 actions, and the NRC's efforts to ensure that Watts Bar
11 construction is adequate and meets NRC requirements.

12 The final report, which will include conclusions
13 about the adequacy of construction, will be issued prior to
14 a decision on issuance of an operating license.

15 In addition, TVA's senior management must certify
16 to the NRC that Unit 1 is ready to load fuel and begin
17 operation.

18 To support this certification, TVA is conducting
19 an integrated assessment of Watts Bar. The initial report
20 of this assessment has been submitted to the staff. The
21 assessment concludes that upon satisfactory completion of
22 ongoing activities there will be reasonable assurance that
23 from a design, construction and operational perspective Unit
24 1 will be ready to load fuel and begin operation.

25 TVA plans to supplement the report after

1 completion of an integrated design inspection and after HFT-
2 2.

3 This concludes my comments. Are there any
4 questions?

5 CHAIRMAN JACKSON: I don't have specific questions
6 for you as such, but I am going to ask you a delicate
7 question. Obviously we are dealing with a plant that has
8 had a lot of history here and there are a lot of lessons
9 learned that presumably TVA has incorporated in what it has
10 been trying to do, but there are issues in terms of lessons
11 learned for us.

12 I invite any of you to give me any comments you
13 wish in terms of the conduct of how we are doing this gives
14 us reasonable assurance that we have incorporated the
15 lessons learned.

16 MR. RUSSELL: Let me start. I think there are two
17 aspects. First is what we are doing on Watts Bar
18 specifically to have confidence, and I will summarize that
19 first, and then I will address programmatically as to what
20 are the lessons learned should we go into a construction
21 program in the future.

22 With respect to Watts Bar, as we have discussed,
23 in my view there are really four critical pieces as director
24 of licensing that I'm going to be looking for for input.

25 The first is the supplement on the safety

1 evaluation that looks broadly at the history of the quality
2 programs pre-1985, what were the problems, what were the
3 issues that came up, what occurred in the summer, fall of
4 1984, what were the corrective actions taken, and have they
5 been effective at addressing the quality problems such that
6 we have confidence today in the quality of the as-built
7 facility in meeting NRC's requirements. That is a major
8 activity to undertake.

9 The second piece is related to how this occurred.
10 We got up to essentially licensing in 1985 and there were
11 significant numbers of deficiencies in the plant that we
12 were unaware of. This called into question inspection
13 activities that we had performed in the past. Along with
14 that, the history of some of the activity since then.

15 We chose to do a complete reconstitution of the
16 construction inspection program looking at each inspection
17 requirement as laid out in our inspection procedures and
18 going back and reverifying that those requirements and the
19 intent of those requirements have been met with the very
20 rigorous review that has taken nearly a year to complete.

21 That resulted in some additional inspection. In
22 addition, we did a time line for those review activities to
23 make sure that if an inspection activity was called into
24 question as a result of a subsequent allegation and we went
25 into the issue again that we looked at that for the root

1 causes and closed it out.

2 That product will be documented in a NUREG report
3 with the data sheets for each inspection procedure, each
4 inspection requirement, what is the basis for our conclusion
5 that it has in fact been met based upon our independent
6 verification.

7 The third major element as it relates to Watts Bar
8 is the expanded scope of hot functional testing-2. There
9 were issues that were raised in an operational context as
10 well as hardware problems during hot functional testing-1.
11 This test is designed to both test the hardware and the
12 readiness of the operating staff to operate the facility.

13 You asked questions earlier as to whether we were
14 satisfied that we had reached agreement on the criteria for
15 those evaluations. What was described was the criteria for
16 testing, test acceptance criteria, hardware performance.

17 We have also reached agreement explicitly on the
18 procedures to be used, what will be performed, what will be
19 simulated, that they are going to act under their tech
20 specs, act under their license, a full dress rehearsal as if
21 fuel were loaded in the core.

22 There are four different groups that are going to
23 be overseeing that, the line management of TVA, the quality
24 organization of TVA, the NRC regional staff that are
25 responsible for operations, and an independent operational

1 readiness assessment team led by headquarters using
2 inspectors from other regions.

3 All of those pieces of information will be put
4 together and summarized both in the licensee's input to the
5 regional administrator and to me, and also by Stew and his
6 input and the regional administrator's report on readiness
7 which we often refer to as the 94-300 letter. It's the
8 letter from the regional administrator that describes why he
9 has confidence that the construction of the facility has
10 been completed in accordance with the terms and conditions
11 of the license.

12 Those four pieces, the 94-300 letter, hot
13 functional testing-2 results, 2512 reconstitution, and the
14 quality program are the broader programmatic issues that I
15 view as critical to be satisfactorily completed. There are
16 a number of other corrective actions that need to be taken.

17 That's the scope of what we are doing for Watts
18 Bar Unit 1.

19 The lessons learned for construction we have been
20 working on separately as it relates to potential licensing
21 of plants in the future. We see that we would do this very
22 differently in the future from what we have done in the
23 past.

24 We actually had congressional inquiries on the
25 construction inspection program, because it was not just

1 Watts Bar. We also had difficulty with Zimmer at the same
2 time. Zimmer was not completed. We had issues with Marble
3 Hill and it was canceled.

4 There were quite a number of facilities where
5 there were quality problems during construction which were
6 not observed early enough by the NRC where things were
7 completed and then there was a lot of rework, and in some
8 cases the utilities concluded that the cost of corrective
9 action was prohibitive and they just canceled the
10 facilities.

11 The approach that we are looking at for licensing
12 in the future, particularly under Part 52, is that we have
13 specified in the design certification and as we are
14 proposing in the combined license specific inspections,
15 tests and analyses to be performed against documented
16 acceptance criteria that would be the basis for concluding
17 that the facility has been constructed in accordance with
18 the terms and conditions of the license. That will be the
19 decision basis on which we would grant an authorization to
20 operate after completion of construction.

21 We are also proposing what is called a sign as you
22 go process. We will request from the licensee in this case,
23 because we have a combined construction and operating
24 license, a schedule of construction activities and
25 identification of when those activities would be available

1 for inspection such that we can conduct the necessary
2 inspections to confirm that the ITAACs have been met, and it
3 would be a roll-up of several inspection activities through
4 a sign as you go process to verify that each one has been
5 done. We would envision this being done with a team of
6 onsite inspectors, with the manager, with specialists coming
7 in at various times to support that.

8 We have developed and followed for the advanced
9 boiling water reactor and actually taken the inspections,
10 tests, analyses and acceptance criteria from the ABWR, and
11 we have had an exchange with our regulatory counterparts in
12 Japan, with MITI, and we have been testing these processes
13 as it relates to construction activities at Kashiwazaki
14 Karawa (phonetic).

15 We have also had some dialogue with the British
16 who have a sign as you go process that was used for
17 construction of Sizewall (phonetic).

18 So we have dovetailed both of those, but because
19 of the current situation in the U.S., we are basically
20 completing that work, putting it on the shelf after having
21 been well documented. We expect to complete that later this
22 summer so that by the end of the year we will not be
23 spending further resources on programmatic development for
24 inspection programs.

25 We believe we have learned the lessons. We have

1 put them in a manner that it can be regained, and we have
2 documented it in a number of Commission papers to the
3 Commission.

4 CHAIRMAN JACKSON: Thank you, Mr. Russell.

5 MR. TAYLOR: We have learned a lot of lessons out
6 of the construction issues of the 1980s, but very clearly,
7 were a construction project to be initiated again in the
8 United States, we would have to put the appropriate
9 resources in a much expanded program. I think we
10 underestimated -- and some of us go back to those days.
11 Stew, you included.

12 MR. EBNETER: Not me.

13 MR. TAYLOR: Yes, you.

14 [Laughter.]

15 MR. TAYLOR: It was very clear as the work in the
16 1980s proceeded that we had inadequate manpower at the site.
17 The continuing presence that I think would be necessary were
18 a project to be restarted in the United States, I think it
19 would be money well invested on the government's part were
20 another project like a nuclear power plant to be started,
21 and I think what the staff has outlined and the many lessons
22 that have been documented we would try to avoid were a
23 future construction project to begin that we had
24 responsibility for.

25 I believe it would take the backing of the

1 Commission and the Congress giving us the appropriate
2 resources, but I believe it would be absolutely necessary to
3 take all the things we learned in the heyday of nuclear
4 construction and provide the resources to assure that this
5 type of problem didn't occur again.

6 COMMISSIONER ROGERS: I'm sure that's right, but
7 don't you think that the new licensing process is so
8 different that with a pre-approved design, a certified
9 design to start out with that it would be a different
10 situation?

11 MR. TAYLOR: That will be different, but you still
12 have the issues of the quality and control of construction.

13 MR. EBNETER: That will bring a whole new set of
14 problems with it, too. Bill described it in clear terms.
15 Any new construction should be more of a team approach.
16 Just having one or two resident inspectors on site will not
17 make it. You need to supplement them on site with focused
18 specialists.

19 One we have to continually learn on is integration
20 that I think the Chairman commented on. We still need to
21 learn a lot of lessons on how to integrate what we find and
22 what we see. Usually in hindsight the indicators are there.
23 We just have not pieced them together right. I think that
24 is particularly difficult on construction where you have
25 thousands of activities going on simultaneously.

1 CHAIRMAN JACKSON: Any other questions?

2 MR. RUSSELL: I would like to come back and
3 summarize a little bit on where we are with Browns Ferry 3
4 and identify some differences between Browns Ferry 3 and
5 Watts Bar. The process we are under requires Commission
6 vote and approval prior to criticality on Browns Ferry 3.
7 Not fuel load. Both units need to load fuel, but the
8 activities of loading fuel are activities that are
9 permissible under the license.

10 Clearly there will be dialogue and there will be
11 interaction back and forth between the site and the region,
12 but we will be coming back to the Commission for a vote
13 prior to criticality.

14 Also, on scheduling issues, there was some
15 discussion as it relates to critical path schedule. I
16 characterize that as that we have reached agreement on what
17 are the critical activities to be performed and the sequence
18 by which they are performed. We use schedule in the context
19 of trying to make sure that we have resources available so
20 that we do not inappropriately delay activities while NRC
21 generates the resources to review what is going on.

22 The schedule that was discussed is a licensee
23 schedule. On Browns Ferry 3 they have been successful in
24 meeting schedules. So there is some credibility associated
25 with that schedule, but that is in fact the licensee's

1 schedule. We could very well be loading fuel and looking at
2 criticality at startup testing with the two units proceeding
3 in parallel if they are successful in completing hot
4 functional testing-2 and the other items for fuel load. We
5 have looked at that from a resource standpoint and are
6 prepared to support that if that does occur.

7 I think I have covered the other items. That ,
8 completes staff's presentation.

9 COMMISSIONER ROGERS: I think this was a very
10 helpful overview. It certainly sounds as if we are on top
11 of the situation. I had all of my questions answered. I
12 think that it looks as if NRC is doing a very thorough job
13 here. It gives me great comfort.

14 CHAIRMAN JACKSON: I would like to thank you all
15 for a very informative and full briefing today. There has
16 obviously been a lot of work done by TVA, but especially,
17 from my perspective, by you. These efforts on your part are
18 critical in our being able to assess that there is
19 sufficient confidence for the issuance of an operating
20 license for Watts Bar and for our rendering a decision on
21 the restart of Browns Ferry Unit 3.

22 The schedule appears to be ambitious, but the open
23 issues obviously must continue to be pursued in order to
24 ensure that all lessons learned are appropriately
25 incorporated and that all equipment, operational readiness

1 and quality assurance issues are addressed. So I encourage
2 you to continue and to continue the communication you've had
3 with TVA, and I look forward to the next round.

4 [Whereupon at 11:20 a.m. the meeting was
5 adjourned.]

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CERTIFICATE

This is to certify that the attached description of a meeting of the U.S. Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING ON STATUS OF WATTS BAR AND
BROWNS FERRY 3 - PUBLIC MEETING

PLACE OF MEETING: Rockville, Maryland

DATE OF MEETING: Wednesday, July 12, 1995

was held as herein appears, is a true and accurate record of the meeting, and that this is the original transcript thereof taken stenographically by me, thereafter reduced to typewriting by me or under the direction of the court reporting company

Transcriber: Michael Paulus

Reporter: Michael Paulus

TENNESSEE VALLEY AUTHORITY'S NUCLEAR PROGRAM

JULY 12, 1995

**WILLIAM T. RUSSELL
STEWART D. EBNETER
JON R. JOHNSON
JOHNS P. JAUDON
FREDERICK J. HEBDON**

NRC PROCESS FOR RESTART APPROVAL

- ° **MANUAL CHAPTER 0350**
- ° **REGION AND HEADQUARTERS COORDINATION**
- ° **RESTART PANEL**
- ° **PERIODIC PROGRESS MEETINGS**
- ° **OTHER GOVERNMENT ORGANIZATIONS**

BROWNS FERRY UNIT 3 CURRENT STATUS OPERATIONS

- **OPERATORS**
- **SYSTEM TURNOVER PROCESS**
- **PROGRAMS AND PROCEDURES**
- **OPERATIONAL READINESS REVIEWS**

BROWNS FERRY UNIT 3 CURRENT STATUS

HARDWARE

- ° **GENERIC AND PLANT SPECIFIC ISSUES**
- ° **ENGINEERING AND CONSTRUCTION**
- ° **SYSTEM TURNOVERS AND TESTING**

BROWNS FERRY UNIT 3 SCHEDULE

- ° **TVA ASSESSMENTS - SEPTEMBER 1995**
- ° **FUEL LOAD - OCTOBER 1995**
- ° **CRITICALITY - DECEMBER 1995**
- ° **TESTING COMPLETE - FEBRUARY 1996**

INSPECTION ACTIVITIES

- **CONSTRUCTION INSPECTIONS AND STATUS**
 - **MC 2512 RECONSTITUTION**
- **OPERATIONAL READINESS INSPECTIONS**
 - **PRE-OPERATIONAL TEST INSPECTIONS**
 - **OPERATIONAL READINESS INSPECTIONS**
 - **STARTUP AND POWER ASCENSION INSPECTIONS**

INSPECTION ACTIVITIES

- **ALLEGATIONS**
- **TVA PERFORMANCE AND STAFF ASSESSMENT**

SIGNIFICANT ACTIVITIES REMAINING

- **HOT FUNCTIONAL TESTING - PHASE 2**
- **CAPS AND SPS**
- **SYSTEM AND AREA TURNOVER**
- **COMPLETE OTHER INSPECTIONS**
 - **OPEN ITEMS**
 - **OPERATIONAL READINESS**

STANDARD LICENSING ACTIVITIES

- o ORIGINAL SER ISSUED IN JUNE 1982**
- o SINCE 1990, TVA SUBMITTED 27 AMENDMENTS TO THE FSAR**

STANDARD LICENSING ACTIVITIES

- O SINCE 1990, THE STAFF ISSUED 11 SUPPLEMENTS TO THE SER**
 - A. LATEST IS SSER 15 (JUNE 1995) - COPIES PROVIDED TO COMMISSION**
 - B. CORRECTIVE ACTIONS LED TO RE-EVALUATION OF NUMEROUS PREVIOUSLY APPROVED ISSUES**
 - C. THE FSAR IS NOW IN GOOD CONDITION; THE STAFF'S FSAR/SER/TECH. SPEC. AUDIT IS ONGOING.**
 - D. EXAMPLES OF REMAINING LICENSING ISSUES: FIRE PROTECTION PROGRAM (INCLUDING USE OF THERMO-LAG); RADWASTE MANAGEMENT SYSTEMS; PRESSURE-TEMPERATURE LIMITS METHODOLOGY; CABLE SEPARATION.**

STANDARD LICENSING ACTIVITIES

- 0 STAFF ISSUED A SUPPLEMENT TO THE FINAL ENVIRONMENTAL STATEMENT, INCLUDING CONSULTATION WITH THE FISH AND WILDLIFE SERVICE CONCERNING ENDANGERED AND THREATENED SPECIES**

ASSURANCE OF WATTS BAR QUALITY

- **WATTS BAR QUALITY ASSURANCE STUDY**
- **TVA'S REASONABLE ASSURANCE STUDY**