

## Alternatives

**Table 8-10. (contd)**

Impact Category	Impact	Comment
Air Quality	MODERATE	Air emissions would be approximately:  Sulfur oxides – 57 MT/yr (63 tons/yr) Nitrogen oxides – 1110 MT/yr (1220 tons/yr) PM <sub>10</sub> – 1000 MT/yr (1120 tons/yr) Carbon monoxide – 4230 MT/yr (4670 tons/yr)  Small amounts of hazardous air pollutants would be emitted along with 13.7 million MT/yr (15.1 million tons/yr) of unregulated carbon dioxide.
Waste	SMALL	The only significant waste would be spent catalyst from the SCR process used to control NO <sub>x</sub> emissions.
Human Health	SMALL	Impacts are uncertain, but considered SMALL in the absence of more quantitative data.
Socioeconomics	MODERATE	Construction impacts depend on location and how many plants are constructed at the location. Limestone County could experience loss of BFN tax base and employment. Impacts related to the operation of the gas plants would be minor. Transportation impacts would result from commuting workers.
Aesthetics	MODERATE to LARGE	Impacts would depend on the site selected and the surrounding land features. Power block, exhaust stacks, cooling towers, and cooling tower plumes would be visible from nearby areas. If needed, new electric power transmission lines could have a LARGE aesthetic impact.
Historic and Archeological Resources	SMALL	Noise impacts from plant operations and intermittent sources would be noticeable. New plant locations would necessitate cultural resource studies. Any potential impacts can likely be effectively managed.
Environmental Justice	SMALL to MODERATE	Impacts would vary depending on population distribution and makeup water at the site. Impacts in Limestone County would be the same as those under the no-action alternative.

### 8.3 Summary of Alternatives Considered

As discussed in Chapter 4, the environmental impacts of the proposed action, renewal of the BFN OLs, are SMALL for all impact categories, except for collective offsite radiological impacts from the fuel cycle and from HLW and spent fuel disposal. Collective offsite radiological impacts from the fuel cycle and from HLW and spent fuel disposal were not assigned a single significance level, but were determined by the Commission to be acceptable. The following alternative actions were considered: the no-action alternative (discussed in Section 8.1); new generation alternatives from pulverized coal, coal gasification, natural gas combined-cycle, and new nuclear (discussed in Sections 8.2.1 through 8.2.4, respectively); purchased electrical

power (discussed in Section 8.2.5); alternative technologies (discussed in Section 8.2.6); and the combination of alternatives (discussed in Section 8.2.7).

The no-action alternative would require (1) replacing electrical generating capacity by (1) DSM and energy conservation, (2) purchasing power from other electricity providers, (3) generating alternatives other than BFN, or (4) some combination of these options, and would result in decommissioning BFN. For each of the new generation alternatives (pulverized coal, coal gasification, natural gas combined-cycle, and new nuclear), the environmental impacts would not be less than the impacts of license renewal. For example, the land-disturbance impacts resulting from construction of any new facility would be greater than the impacts of continued operation of BFN. The impacts of purchased electrical power would still occur, but would occur elsewhere. Alternative technologies are not considered feasible at this time, and it is very unlikely that the environmental impacts of any reasonable combination of generation and conservation options could be reduced to the level of impacts associated with renewal of the BFN OLS.

The staff concludes that the alternative actions, including the no-action alternative, may have environmental effects in at least some impact categories that reach MODERATE or LARGE significance.

## 8.4 References

10 CFR Part 20. Code of Federal Regulations, Title 10, *Energy*, Part 20, "Standards for Protection Against Radiation."

10 CFR Part 50. Code of Federal Regulations, Title 10, *Energy*, Part 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Functions."

10 CFR Part 52. Code of Federal Regulations, Title 10, *Energy*, Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

40 CFR Part 50. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 50, "National Primary and Secondary Ambient Air Quality Standards."

40 CFR Part 51. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 51, "Requirements for Preparation, Adoption, and Submittal of Implementation Plans."

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40 CFR Part 60. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 60, "Standards of Performance for New Stationary Sources."

40 CFR Part 63. Code of Federal Regulations, Title 40, *Protection of the Environment*, Part 63, "National Emissions Standards for Hazardous Air Pollutants for Source Categories."

40 CFR Part 125, Subpart I. Code of Federal Regulations, Title 40, *Protection of the Environment*, Part 125, Subpart I, "Requirements Applicable to Cooling Water Intake Structures for New Facilities Under Section 316(b) of the Act."

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## 9.0 Summary and Conclusions

By letter dated December 31, 2003, the Tennessee Valley Authority (TVA) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to renew the operating licenses (OLs) for Browns Ferry Nuclear Power Plant, Units 1, 2, and 3 (BFN) for an additional 20-year period (TVA 2003a). If the OLs are renewed, State regulatory agencies and TVA will ultimately decide whether the plant will continue to operate based on factors such as the need for power or other matters within the State's jurisdiction or the purview of the owners. If the OLs are not renewed, then the plants must be shut down at or before the expiration of the current OLs, which expire on December 20, 2013, for Unit 1, June 28, 2014, for Unit 2, and July 2, 2016, for Unit 3.

Section 102 of the National Environmental Policy Act of 1969 (NEPA) (42 USC 4321) directs that an environmental impact statement (EIS) is required for major Federal actions that significantly affect the quality of the human environment. The NRC has implemented Section 102 of NEPA in Title 10 of the Code of Federal Regulations (CFR) Part 51. Part 51 identifies licensing and regulatory actions that require an EIS. In 10 CFR 51.20(b)(2), the Commission requires preparation of an EIS or a supplement to an EIS for renewal of a reactor OL; 10 CFR 51.95(c) states that the EIS prepared at the OL renewal stage will be a supplement to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2 (NRC 1996, 1999).<sup>(a)</sup>

Upon acceptance of the TVA application, NRC began the environmental review process described in 10 CFR Part 51 by publishing a Notice of Intent to prepare an EIS and conduct scoping on March 10, 2004 (69 FR11462). The staff visited the BFN site in March 2004 and held public scoping meetings on April 1, 2004, in Athens, Alabama (NRC 2004). The staff reviewed the TVA Environmental Report (ER) (TVA 2003b) and other TVA environmentally related documents and compared them to the GEIS, consulted and discussed the application with other agencies, and conducted an independent review of the issues following the guidance set forth in NUREG-1555, Supplement 1, the *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal* (NRC 2000). The staff also considered the public comments received during the scoping process for preparation of this supplemental environmental impact statement (SEIS) for BFN. The public comments received during the scoping process that were considered to be within the scope of the environmental review are provided in Appendix A, Part 1, of this SEIS.

The draft SEIS was published and distributed for public comment on December 3, 2004. The staff held two public meetings in Athens, Alabama, in January 2005, to describe the results of

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(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

## Summary and Conclusions

the NRC environmental review, answer questions, and to provide members of the public with information to assist them in formulating their comments on this SEIS. The comment period ended on March 2, 2005. Comments made during the 75-day comment period, including those made at the two public meetings, are presented in Part 2 of Appendix A of this SEIS.

This SEIS includes the NRC staff's analysis that considers and weighs the environmental effects of the proposed action, the environmental impacts of alternatives to the proposed action, and mitigation measures available for reducing or avoiding adverse effects. It also includes the staff's recommendation regarding the proposed action.

The NRC has adopted the following statement of purpose and need for license renewal from the GEIS:

The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, utility, and, where authorized, Federal (other than NRC) decisionmakers.

The goal of the staff's environmental review, as defined in 10 CFR 51.95(c)(4) and the GEIS, is to determine

... whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

Both the statement of purpose and need and the evaluation criterion implicitly acknowledge that there are factors, in addition to license renewal, that will ultimately determine whether an existing nuclear power plant continues to operate beyond the period of the current OL.

NRC regulations [10 CFR 51.95(c)(2)] contain the following statement regarding the content of SEISs prepared at the license renewal stage:

The supplemental environmental impact statement for license renewal is not required to include discussion of need for power or the economic costs and economic benefits of the proposed action or of alternatives to the proposed action except insofar as such benefits and costs are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or relevant to mitigation. In addition, the supplemental environmental impact statement prepared at the license renewal stage need not discuss other issues not related to the environmental effects of the proposed

action and the alternatives, or any aspect of the storage of spent fuel for the facility within the scope of the generic determination in § 51.23(a) and in accordance with § 51.23(b).<sup>(a)</sup>

The GEIS contains the results of a systematic evaluation of the consequences of renewing an OL and operating a nuclear power plant for an additional 20 years. It evaluates 92 environmental issues using the NRC's three-level standard of significance – SMALL, MODERATE, or LARGE – developed using the Council on Environmental Quality guidelines. The following definitions of the three significance levels are set forth in the footnotes to Table B-1 of 10 CFR Part 51, Subpart A, Appendix B:

**SMALL** – Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

**MODERATE** – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

**LARGE** – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

For 69 of the 92 issues considered in the GEIS, the staff analysis in the GEIS shows the following:

- (1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics.
- (2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal).
- (3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

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(a) The title of 10 CFR 51.23 is "Temporary storage of spent fuel after cessation of reactor operations-generic determination of no significant environmental impact."



## Summary and Conclusions

These 69 issues were identified in the GEIS as Category 1 issues. In the absence of new and significant information, the staff relied on conclusions as amplified by supporting information in the GEIS for issues designated Category 1 in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B.

Of the 23 issues that do not meet the criteria set forth above, 21 are classified as Category 2 issues requiring analysis in a plant-specific supplement to the GEIS. The remaining two issues, environmental justice and chronic effects of electromagnetic fields, were not categorized. Environmental justice was not evaluated on a generic basis and must also be addressed in a plant-specific supplement to the GEIS. Information on the chronic effects of electromagnetic fields was not conclusive at the time the GEIS was prepared.

This SEIS documents the staff's consideration of all 92 environmental issues identified in the GEIS. The staff considered the environmental impacts associated with alternatives to license renewal and compared the environmental impacts of license renewal and the alternatives. The alternatives to license renewal that were considered include the no-action alternative (not renewing the OLS for BFN) and alternative methods of power generation. These alternatives were evaluated assuming that the replacement power generation plant is located at either the BFN site, at the unfinished Bellefonte nuclear plant site, or at other locations.

### **9.1 Environmental Impacts of the Proposed Action – License Renewal**

TVA and the NRC staff have established independent processes for identifying and evaluating the significance of any new information on the environmental impacts of license renewal. Neither TVA nor the NRC staff has identified information that is both new and significant related to Category 1 issues that would call into question the conclusions in the GEIS. Similarly, neither the scoping process, TVA, nor the NRC staff has identified any new issue applicable to BFN that has a significant environmental impact. Therefore, the staff relies upon the conclusions of the GEIS for all Category 1 issues that are applicable to BFN.

TVA's license renewal application presents an analysis of the Category 2 issues that are applicable to BFN, plus environmental justice and chronic effects from electromagnetic fields. The staff has reviewed the TVA analysis for each issue and has conducted an independent review of each issue plus environmental justice and chronic effects from electromagnetic fields. Three Category 2 issues are not applicable because they are related to plant design features or site characteristics not found at BFN. Four Category 2 issues are not discussed in this SEIS because they are specifically related to refurbishment. TVA has stated that its evaluation of structures and components, as required by 10 CFR 54.21, did not identify any major plant refurbishment activities or modifications as necessary to support the continued operation of

BFN for the license renewal term (TVA 2003b). In addition, any replacement of components or additional inspection activities are within the bounds of normal plant component replacement and, therefore, are not expected to affect the environment outside the bounds of the plant operations evaluated in the TVA *Final Environmental Statement Related to the Operation of Browns Ferry Units 1, 2, and 3* (TVA 1972), which was adopted by the Atomic Energy Commission.

Fourteen Category 2 issues related to operational impacts and postulated accidents during the license renewal term, as well as environmental justice and chronic effects of electromagnetic fields, are discussed in detail in this SEIS. Four of the Category 2 issues and environmental justice apply to both refurbishment and to operation during the license renewal term and are only discussed in this SEIS in relation to operation during the license renewal term. For all 14 Category 2 issues and environmental justice, the staff concludes that the potential environmental effects are of SMALL significance in the context of the standards set forth in the GEIS. In addition, the staff determined that appropriate Federal health agencies have not reached a consensus on the existence of chronic adverse effects from electromagnetic fields. Therefore, no further evaluation of this issue is required. For severe accident mitigation alternatives (SAMAs), the staff concludes that a reasonable, comprehensive effort was made to identify and evaluate SAMAs. Based on its review of the SAMAs for BFN and the plant improvements already made, the staff concludes that none of the candidate SAMAs are cost-beneficial.

Mitigation measures were considered for each Category 2 issue. Current measures to mitigate the environmental impacts of plant operation were found to be adequate, and no additional mitigation measures were deemed sufficiently beneficial to be warranted. Cumulative impacts of past, present, and reasonably foreseeable future actions were considered, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. For purposes of this analysis, where BFN license renewal impacts are deemed to be SMALL, the staff concluded that these impacts would not result in significant cumulative impacts on potentially affected resources.

The following sections discuss unavoidable adverse impacts, irreversible or irretrievable commitments of resources, and the relationship between local short-term use of the environment and long-term productivity.

### **9.1.1 Unavoidable Adverse Impacts**

An environmental review conducted at the license renewal stage differs from the review conducted in support of a construction permit because the plant is in existence at the license renewal stage and has operated for a number of years. As a result, adverse impacts

## Summary and Conclusions

associated with the initial construction have been avoided, have been mitigated, or have already occurred. The environmental impacts to be evaluated for license renewal are those associated with refurbishment and continued operation during the license renewal term.

The adverse impacts of continued operation identified are considered to be of SMALL significance, and none warrants implementation of additional mitigation measures. The adverse impacts of likely alternatives if BFN ceases operation at or before the expiration of the current OLS will not be smaller than those associated with continued operation of these units, and they may be greater for some impact categories in some locations.

### 9.1.2 Irreversible or Irrecoverable Resource Commitments

The commitment of resources related to construction and operation of BFN during the current license term was made when the plant was built. The resource commitments to be considered in this SEIS are associated with continued operation of the plant for an additional 20 years. These resources include materials and equipment required for plant maintenance and operation, the nuclear fuel used by the reactors, and ultimately, permanent offsite storage space for the spent fuel assemblies.

The most significant resource commitments related to operation during the license renewal term are the new fuel and the permanent storage space for the spent fuel. BFN currently replaces approximately 38 percent of the fuel assemblies in each unit during every refueling outage, which occurs on a 24-month cycle. With the planned extended power uprate, and a change to blended low-enriched uranium fuel assemblies, the proportion of the fuel assemblies replaced during each refueling cycle may increase to approximately 48 percent.

The likely power generation alternatives if BFN ceases operation on or before the expiration of the current OLS will require a commitment of resources for construction of the replacement plants as well as for fuel to operate the plants.

### 9.1.3 Short-Term Use Versus Long-Term Productivity

An initial balance between local short-term uses and the maintenance and enhancement of the long-term productivity of the environment at the BFN site was set when the plants were approved and construction began. That balance is now well established. Renewal of the OLS for BFN and continued operation of the plants will not alter the existing balance because the decision to use the BFN site to produce power has already been made, but may postpone the availability of the site for other uses. Denial of the application to renew the OLS will lead to

shutdown of the plants and will alter the balance in a manner that depends on subsequent uses of the site. For example, the environmental consequences of turning the BFN site into a park or an industrial facility are quite different.

## 9.2 Relative Significance of the Environmental Impacts of License Renewal and Alternatives

The proposed action is renewal of the OLS for Units 1, 2, and 3 at BFN. Chapter 2 describes the site, the power plant, and interactions of the plant with the environment. As noted in Chapter 3, no refurbishment activities and therefore no refurbishment impacts are expected at BFN. Chapters 4 through 7 discuss environmental issues associated with renewal of the OLS. Environmental issues associated with the no-action alternative and alternatives involving power generation and use reduction are discussed in Chapter 8.

The significance of the environmental impacts from the proposed action (approval of the application for renewal of the OLS), the no-action alternative (denial of the application), alternatives involving coal-fired, or natural-gas-fired generation at the BFN site or other sites, and nuclear or coal gasification generation at the TVA-owned Bellefonte site, and a combination of alternatives are compared in Table 9-1. Continued use of a once-through cooling system with helper towers for BFN is assumed for Table 9-1.

Table 9-1 shows that the significance of the environmental effects of the proposed action are SMALL for all impact categories (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal, for which a single significance level was not assigned [Chapter 6]). The alternative actions, including the no-action alternative, may have environmental effects in at least some impact categories that reach MODERATE or LARGE significance.

## 9.3 Staff Conclusions and Recommendations

Based on (1) the analysis and findings in the GEIS (NRC 1996, 1999); (2) the TVA Environmental Report (TVA 2003b); (3) consultation with Federal, State, and local agencies; (4) the staff's own independent review; and (5) the staff's consideration of public comments, the recommendation of the staff is that the Commission determine that the adverse environmental impacts of license renewal for Units 1, 2, and 3 at BFN are not so great that preserving the option of license renewal for energy-planning decisionmakers would be unreasonable.

**Table 9-1. Summary of Environmental Significance of License Renewal, the No-Action Alternative, and Alternative Methods of Generation Using Closed-Cycle Cooling**

Impact Category	Proposed Action (License Renewal)	No-Action Alternative (Denial of Renewal)	Pulverized Coal-Fired Generation	Coal Gasification <sup>(a)</sup>	Natural-Gas-Combined-Cycle Generation	New Nuclear Generation <sup>(a)</sup>	Combination of Energy Alternatives
Land Use	SMALL	SMALL	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE	SMALL to LARGE	MODERATE to LARGE
Ecology	SMALL	SMALL	MODERATE to LARGE	SMALL to LARGE	MODERATE	SMALL to LARGE	MODERATE
Water Use and Quality	SMALL	SMALL	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE
Air Quality	SMALL	SMALL	MODERATE	MODERATE	MODERATE	SMALL	MODERATE
Waste	SMALL	SMALL	MODERATE	MODERATE	SMALL	SMALL	SMALL
Human Health	SMALL <sup>(b)</sup>	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL
Socioeconomics	SMALL	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE to LARGE	MODERATE
Aesthetics	SMALL	SMALL	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE	MODERATE to LARGE
Historic and Archaeological Resources	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL
Environmental Justice	SMALL	SMALL	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE

(a) This alternative assumes building at TVA's unfinished Bellefonte nuclear plant site.

(b) Except for collective offsite radiological impacts from the fuel cycle and from HLW and spent-fuel disposal, for which a significance level was not assigned. See Chapter 6 for details.

## 9.4 References

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR Part 54. Code of Federal Regulations, Title 10, *Energy*, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

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U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Main Report, Section 6.3 – Transportation, Table 9.1, Summary of findings on NEPA issues for license renewal of nuclear power plants, Final Report*. NUREG-1437, Volume 1, Addendum 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2000. "Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal." NUREG-1555, Supplement 1, Washington, D.C.

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## **Appendix A**

### **Comments Received on the Environmental Review**

## Appendix A

### Comments Received on the Environmental Review

#### Part I – Comments Received During Scoping

On March 10, 2004, the U.S. Nuclear Regulatory Commission (NRC) published a Notice of Intent in the Federal Register (69 FR 11462), to notify the public of the staff's intent to prepare a plant-specific supplement to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2, to support the renewal application for the Browns Ferry operating licenses and to conduct scoping. The plant-specific supplement to the GEIS has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), Council on Environmental Quality (CEQ) guidance, and Title 10 of the Code of Federal Regulations (CFR) Part 51. As outlined by NEPA, the NRC initiated the scoping process with the issuance of the Federal Register Notice. The NRC invited the applicant; Federal, State, and local government agencies; Native American tribal organizations; local organizations; and individuals to participate in the scoping process by providing oral comments at the scheduled public meetings and/or submitting written suggestions and comments no later than May 9, 2004. The deadline for filing comments was subsequently extended to June 4, 2004 (69 FR 30338).

The scoping process included two public scoping meetings, which were held at Athens State University in Athens, Alabama on April 1, 2004. Approximately 40 members of the public attended each meeting. Both sessions began with NRC staff members providing a brief overview of the license renewal process and the NEPA process. After the NRC's prepared statements, the meetings were open for public comments. Seven attendees provided oral statements that were recorded and transcribed by a certified court reporter and written statements that were appended to the transcript. The meeting transcripts are an attachment to the April 1, 2004, Scoping Meeting Summary dated May 14, 2004. The meeting summary is available electronically for public inspection in the NRC's Agencywide Documents Access Management System (ADAMS) at <http://www.nrc.gov/reading-rm/adams.html> under accession number ML041390581. In addition to the comments received during the public meetings, four comment letters and two e-mail messages were received by the NRC in response to the Notice of Intent.

The NRC received a letter dated May 19, 2004, from Mr. Larry Goldman of the U.S. Fish and Wildlife Service (FWS) providing comments on the environmental review. These comments were not included in the scoping summary report. However, the staff did consider the comments from the May 19 FWS letter in the preparation of this supplemental environmental impact statement (SEIS).



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At the conclusion of the scoping period, the NRC staff and its contractor(s) reviewed the transcripts and all written material to identify specific comments and issues. Each set of comments from a given commenter was given a unique identifier (Commenter ID), so that each set of comments from a commenter could be traced back to the transcript or letter by which the comments were submitted. Specific comments were numbered sequentially within each comment set. One commenter submitted comments through multiple sources (e.g., afternoon and evening scoping meetings). All of the comments received and the staff responses are included in the Environmental Scoping Summary Report dated July 2004.

Table A-1 identifies the individuals who provided comments applicable to the environmental review and the Commenter ID associated with each person's set(s) of comments. The individuals are listed in the order in which they spoke at the public meeting, and in alphabetical order for the comments received by letter or e-mail. To maintain consistency with the Scoping Summary Report, the unique identifier used in that report for each set of comments is retained in this appendix.

Specific comments were categorized and consolidated by topic. Comments with similar specific objectives were combined to capture the common essential issues raised by the commenters. The comments fall into one of the following general groups:

- Specific comments that address environmental issues within the purview of the NRC environmental regulations related to license renewal. These comments address Category 1 or Category 2 issues or issues that were not addressed in the GEIS. They also address alternatives and related Federal actions.
- General comments (1) in support of or opposed to nuclear power or license renewal or (2) on the renewal process, the NRC's regulations, and the regulatory process. These comments may or may not be specifically related to the Browns Ferry license renewal application.
- Questions that do not provide new information.
- Specific comments that address issues that do not fall within or are specifically excluded from the purview of NRC environmental regulations related to license renewal. These comments typically address issues such as the need for power, emergency preparedness, security, current operational safety issues, and safety issues related to operation during the license renewal term.

**Table A-1. Individuals Providing Comments During Scoping Comment Period**

<b>Commenter ID</b>	<b>Commenter</b>	<b>Affiliation (If Stated)</b>	<b>Comment Source and Accession Number:</b>
BF-A	Stewart Horn		Afternoon Scoping Meeting ML041350407
BF-B	Dr. Lane Price		Afternoon Scoping Meeting ML041350407
BF-C	Ann Harris	We the People, Inc.	Afternoon Scoping Meeting ML041350407
BF-D	Stewart Ward		Afternoon Scoping Meeting ML041350407
BF-E	Chuck Wilson	Tennessee Valley Authority	Afternoon Scoping Meeting ML041350407
BF-F	Nancy Muse		Evening Scoping Meeting ML041350459
BF-G	Jeff North		Evening Scoping Meeting ML041350459
BF-H	Chuck Wilson	Tennessee Valley Authority	Evening Scoping Meeting ML041350459
BF-I	Zola		Email ML041250405
BF-J	Michael Bolt	Eastern Band of Cherokee Indians	Email ML0415540361
BF-K	Michelle Hamilton	Eastern Band of Cherokee Indians	Comment Letter ML041490083
BF-L	Sara Barczak and David Ritter	Southern Alliance for Clean Air and Public Citizen's Critical Mass Energy and Environmental Program	Comment Letter ML041340245
BF-M	Anoatubby	Chickasaw Nation	Comment Letter ML041410044
BF-N	Frances Lamberts	Tennessee League of Women Voters	Comment Letter ML041600095

Comments applicable to this environmental review and the staff's responses are summarized in this appendix. The specific alpha-numeric identifier (marker) after each comment refers to the comment set (Commenter ID) and the comment number. This information, which was extracted from the Browns Ferry Scoping Summary Report, is provided for the convenience of those interested in the scoping comments applicable to this environmental review. The

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comments that are general or outside the scope of the environmental review for Browns Ferry are not included here. More detail regarding the disposition of general or inapplicable comments can be found in the summary report. The Scoping Summary Report is available electronically for public inspection in ADAMS. ADAMS is accessible at <http://www.nrc.gov/reading-rm/adams.html>. The ADAMS accession number for the Scoping Summary Report is ML041970736.

Comments in this section are grouped in the following categories:

- A.1.1 Aquatic Ecology Issues
- A.1.2 Threatened and Endangered Species
- A.1.3 Air Quality Issues
- A.1.4 Human Health Issues
- A.1.5 Cultural Resources Issues
- A.1.6 Alternative Energy Sources
- A.1.7 Surface-Water Quality, Hydrology, and Use
- A.1.8 Postulated Accidents
- A.1.9 Uranium Fuel Cycle

### Part I. Comments Received During Scoping

#### A.1 Comments and Responses

The comments and suggestions received as part of scoping are discussed below. Parenthetical numbers after each comment refer to the commenter's ID letter and the comment number. Comments can be tracked to the commenter and the source document through the ID letter and comment number listed in Table A-1.

##### A.1.1 Comments Concerning Aquatic Ecology Issues

**Comment:** I don't understand the terminology impingement and entrainment. I don't know how to comment on that without understanding what it is. (BF-F-6)

**Comment:** Through impingement and entrainment, and through thermal alteration of returned water they cause damage to aquatic life, including great fishery and related recreational losses along river systems on which they are located. (BF-N-15)

**Response:** *Impingement occurs when fish or shellfish are pulled onto the intake screens that are part of the cooling water systems associated with nuclear power plants. Entrainment occurs when fish, shellfish, or larvae that are too small to be impinged on the screen are*

*entrained in the flow through the plant, traversing the plant cooling system. Impingement and entrainment, as well as other aquatic ecology issues, will be discussed in Chapter 2 and Chapter 4 of the SEIS.*

**Comment:** The EIS should include (3) analysis of aquatic wildlife and terrestrial species impacts, with extensive involvement of the Federal and State agencies charged with natural resource protection. (BF-N-23)

**Response:** *Impacts to aquatic and terrestrial species will be discussed in Chapter 4 of the SEIS.*

### **A.1.2 Comments Concerning Threatened and Endangered Species**

**Comment:** New data on the status of Federally and State-listed endangered or threatened terrestrial animal, aquatic, and plant species should be required and studied as to the impacts of an additional 20 years of operations per reactor. (BF-L-13)

**Comment:** Proper notification to, along with creation of working relationships with, state agencies, Fish and Wildlife Service, and National Marine Fisheries Service should occur. (BF-L-14)

**Response:** *During the analysis and preparation of the draft SEIS for license renewal, the NRC staff consults with appropriate Federal agencies. The NRC usually contacts directly the U.S. Fish and Wildlife Service (Department of the Interior) and the National Marine Fisheries Service (Department of Commerce) for environmental issues related to the impact on any threatened or endangered species that may be in the vicinity of the plant or to any critical habitat. If other agencies have actions or jurisdiction over areas directly related to the review, they would also be contacted directly by the NRC.*

*In addition to NRC coordinated consultation, after a draft SEIS is published, it is also reviewed by various Federal agencies at their discretion. For example, at the Federal level, the draft SEIS for license renewal is most commonly reviewed by the U.S. Environmental Protection Agency and the Department of the Interior. The comments from these agencies are considered and included in the final SEIS as appropriate.*

*Potential impacts of renewing the operating licenses for Browns Ferry Nuclear Plant, Units 1, 2, and 3 on threatened or endangered species will be evaluated in Chapter 2 and Chapter 4 of the SEIS.*

### **A.1.3 Comments Concerning Air Quality**

**Comment:** We note that Limestone County is not evaluated as having bad air quality and that the annual quantity of emissions released into the atmosphere is normal for a nuclear plant. In an ideal situation it would not be necessary for us to make comment on air quality, however the air quality situation is far from ideal in the Great Smoky Mountains. Because air flows from Alabama frequently move towards our mountains we would like to encourage the exploration of reducing emissions at Browns Ferry. (BF-J-1)

**Response:** *Air quality impacts from plant operations were evaluated in the GEIS and found to be minimal. Air emissions are regulated by the U.S. Environmental Protection Agency and the State of Alabama. Air quality will be discussed in Chapter 2 of the SEIS.*

### **A.1.4 Comments Concerning Human Health**

**Comment:** I'm also concerned about the level of radioactive substances that are effluent. If and what they are, and where can we get that information. Is that on the web site of the NRC? Radioactivity that is released into the environment in any way. (BF-F-7)

**Comment:** Could you specifically address the effluent from Browns Ferry. What do you all actually put into the river, itself? (BF-B-1)

**Comment:** I want to know whether the Millie is per what or per person. What it meant when you gave that answer, when you said equal to a dose of ... Is that what a person can get by being in the water at the point of the – at the pipes? (BF-D-1)

**Response:** *NRC is a regulatory agency charged with assuring public health and safety. NRC does this by providing the industry with regulations as well as conducting plant inspections. The licensee is allowed to release gaseous and liquid effluents to the environment, but the releases must be monitored and meet the requirements of 10 CFR Part 20, Appendix B, Table 2; therefore, contaminants may be present and detectable offsite. However, the release limits have been designed and proven to be protective of the health and safety of the public and environment. NRC sets limits on radiological effluents, requires monitoring of effluents and foodstuffs to ensure those limits are met, and has set dose limits to regulate the release of radioactive material from nuclear power facilities. The regulations are intentionally conservative and provide adequate protection for the public including the most radiosensitive members of the population. TVA monitors its effluent and calculates an offsite annual dose caused by radioactive liquid and gaseous effluents. These calculations are performed to demonstrate the licensee's compliance with its technical specifications and NRC regulations.*

NRC publishes two annual reports for Browns Ferry regarding environmental monitoring and environmental effluents. The "Annual Radiological Environmental Operating Report (AREOR)" and the "Annual Radiological Effluent Release (ARER) Report" are available to the public through NRC's Public Document Room in Rockville, Maryland, or from NRC's Electronic Reading Room available online at <http://www.nrc.gov/reading-rm.html>. The comments did not provide new and significant information; therefore, they will not be evaluated further.

#### **A.1.5 Comments Concerning Cultural Resources**

**Comment:** According to the information you provided, the EBCI's THPO has determined that the proposed activities will not have an effect on any known cultural resources significant to our Tribe. (BF-K-1)

**Comment:** We have also determined the undertaking will not have an effect on known cultural resources listed on or eligible for the National Register of Historic Places provided that archaeological site 1Li535 is avoided as stated in the BFN License Renewal Final Supplemental EIS. (BF-K-2)

**Response:** *The comments refer to historic and archaeological resources near Browns Ferry. These issues will be addressed in Chapter 2 and Chapter 4 of the SEIS.*

#### **A.1.6 Comments Concerning Alternative Energy Sources**

**Comment:** In our experience, the relicensing process has generally provided an inadequate analysis of energy alternatives. (BF-L-15)

**Comment:** In addition, other electricity generating technologies, such as solar, wind, and biomass should be investigated. (BF-L-17)

**Comment:** The League believes that an emphasis on conserving energy and using energy-efficient technologies is by far the wisest and safest course of action for our nation and state. (BF-N-3)

**Comment:** The League also believes that predominant reliance should be placed on production of energy from renewable sources. (BF-N-5)

**Comment:** We have applauded and strongly support the TVA's initiation of a Green Power Switch program whose wind, solar, and methane gas installations now produce electric power for more than seven thousand residential and business users. At this time, however, TVA's generational capacity under this program makes up less than one percent of its capacity from

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the two, now operating Browns Ferry units. For ecological and other reasons, the strongest market trends in the energy field, around the world favor energy production from renewable sources and weight of public opinion is on the side of expansion of these sources, at least within the Tennessee part of the Agency service area. (BF-N-6)

**Response:** *The GEIS included an extensive discussion of alternative energy sources. Environmental impacts associated with various reasonable alternatives to renewal of the operating licenses for Browns Ferry will be discussed in Chapter 8 of the SEIS. The comments did not provide new and significant information; therefore, they will not be evaluated further.*

**Comment:** It should thoroughly assess and clearly delineate (2) the alternative options and their economic, environmental and social benefits and costs. Delineation of alternatives should include optimization of energy efficiency technologies, energy conservation, and Green-Power-Switch program maximization. (BF-N-22)

**Comment:** It should also include comprehensive assessment and comparison of normal (4) safety-related costs for nuclear plants relative to alternative, renewable-source generation options. (BF-N-24)

**Comment:** The NRC must review in every respect these safety implications and costs of nuclear-power sources as against the societal and environmental advantages which renewable and substantially risk-free generation sources offer. (BF-N-27)

**Response:** *NRC determined that an applicant for license renewal need not provide an analysis of the economic costs or economic benefits of the proposed or alternative actions. The comments did not provide new and significant information; therefore, they will not be evaluated further.*

### **A.1.7 Comments Concerning Surface-Water Quality, Hydrology, and Use**

**Comment:** I will only focus on the high discharge temperature that will occur when all three units are operating at 3952 megawatts thermal. The existing five cooling towers are unable to cool the water at peak summer conditions without derating an operating unit. (BF-I-1)

**Comment:** There is no concerted effort to built back cooling tower #4 or build additional cooling towers to allow operation at 100 percent of Extended Power Uprate (EPU) without derating all three units or having to take one off-line. Studies have been conducted by TVA's Norris labs to validate this assertion. (BF-I-2)

**Comment:** I believe there is a planned effort to allow Unit 1 to continue in its effort to restart with paying for the adequate cooling to meet the discharge limits. This is being driven by a fervent desire to hold the restart costs down and not impact schedule dates. (BF-I-3)

**Response:** *These comments refer to surface-water quality issues. These issues will be addressed in Chapters 2 and 4 of the SEIS.*

**Comment:** NRC should evaluate the impacts of extended generation from a regional perspective and should investigate state-level political concerns that may affect that ability to dedicate large water resources for extremely long periods of time. (BF-L-9)

**Comment:** NRC should require updated water use information for the region on current water needs, as in what industries and municipalities are currently using and are projected to use in the future as population centers continue to grow. (BF-L-12)

**Comment:** Since construction of the Brown's Ferry plant some four decades ago, Tennessee and the region have experienced enormous growth in population, with corresponding demands on water—our most important and life-necessary natural resource. (BF-N-16)

**Comment:** Since Unit 1 has not operated since 1985, and all of the reactors came online for a time in the mid-to-late 1970s, thorough water withdrawal and water consumption analyses, along with fish and vegetation studies, must be done using updated data (not referring back to original operating license information). (BF-L-10)

**Comment:** Further, the impact of the water withdrawn and its effect on the flow of the Tennessee River should be evaluated not during just "normal" conditions but in times of drought, which have impacted the region when Browns Ferry Unit 1 was not even operating. (BF-L-11)

**Comment:** We have strong concerns regarding nuclear power plant impacts on the region's water resources. Reactors like those at Browns Ferry consume through evaporation about 20,000 gallons per minute; their flow-through rate exceeds 600,000 gallons per minute and their direct and indirect cost to the water resource exceeds 50 gallons per each kilowatt hour of electricity they generate. (BF-N-14)

**Comment:** Given their huge withdrawal demands, it is imperative that the NRC consider the water impacts from the Browns Ferry reactors in a comprehensive way and from the perspective of all human and wildlife needs and all competing uses over the longer-term future. (BF-N-17)



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**Comment:** We believe, therefore, that committing to electricity generation such large water withdrawals as are needed for safe operation of the Browns Ferry reactors, for more than three decades hence, may not be wise when generation options which have no or minimal impacts (e.g., from renewable sources), are available. (BF-N-19)

**Response:** *These comments refer to water use and water use conflicts. These issues will be addressed in Chapter 4 of the SEIS.*

**Comment:** Possible threats to water security in the region under various climate-change scenarios must also be considered in this context. (BF-N-18)

**Response:** *While climate change is a legitimate concern, the specific impacts of climate change within a particular region or watershed are still highly speculative, and are therefore beyond the scope of a NEPA review for reactor license renewal. Furthermore, any changes in watershed characteristics would likely be gradual, allowing water use conflicts to be resolved as needed. The comment did not provide new and significant information; therefore, it will not be evaluated further.*

### A.1.8 Comments Concerning Postulated Accidents

**Comment:** Directly relevant to Browns Ferry Unit 1 concerns about restart and the subsequent operating extension are the accident projections from the Brookhaven National Laboratory Study in 1997 for a closed BWR for an area within 50 miles of the plant: population dose of 38 million rem, 15, 300 latent fatalities, 140 square miles of condemned land, and a cost of \$48 billion (NUREG/CR-6451, April 1997). (BF-L-4)

**Comment:** I believe that the people of the Tennessee Valley may be in real danger from a major nuclear accident if these concerns prove to be accurate. (BF-A-4)

**Response:** *The effects of accidents are considered in both environmental and safety reviews for license renewal. Postulated accidents, including design-basis and severe accidents, will be addressed in Section 5.0 and Appendix G of the SEIS.*

### A.1.9 Comments Concerning Uranium Fuel Cycle

**Comment:** Further, spent fuel casks, both for onsite storage and for transportation, have not undergone adequate testing to demonstrate thorough safety and containment of radiation, both during normal usage and during various accident scenarios. (BF-L-22)

**Comment:** Again, the industry's inclination to take every opportunity to cut costs (in attempting to make nuclear energy appear remotely viable, economically) creates a disturbing tension here, with nuclear utilities gravitating towards the casks that are cheapest and the least tested. (BF-L-23)

**Response:** *NRC is committed to preventing detrimental health impacts to the public. NRC has regulations covering the long-term storage of spent fuel onsite as well as packaging and transport of radioactive material. These regulations regarding packaging and transport of radioactive material are found at 10 CFR Part 71. NRC regulations related to exposure to the public are found at 10 CFR Part 20. In addition, the Department of Transportation and the U.S. Environmental Protection Agency have regulations to protect the public from health effects associated with radiation. Department of Transportation regulations related to transportation of radioactive material are found at 49 CFR Part 173, and Environmental Protection Agency regulations related to radiation are found at 40 CFR Parts 190 through 194.*

*The safety and environmental effects of long-term storage of spent fuel onsite has been evaluated by NRC, and as set forth in the Waste Confidence Rule, the NRC has generically determined that such storage can be accomplished without significant environmental impact. In the Waste Confidence Rule, the Commission determined that spent fuel can be safely stored onsite for at least 30 years beyond the licensed operating life, which may include the term of a renewed license. NRC has a certification process for casks, regulated by 10 CFR Part 72. Such wastes are under continual licensing control. The comments did not provide new and significant information; therefore, they will not be evaluated further.*

## **Part II. Comments Received on the Draft SEIS**

Pursuant to 10 CFR Part 51, the staff transmitted the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Regarding Browns Ferry Nuclear Power Plant, Units 1, 2, and 3, Draft Report for Comment* (NUREG-1437, Supplement 21, referred to as the draft SEIS) to Federal, State, Native American Tribal, and local government agencies as well as interested members of the public. As part of the process to solicit public comments on the draft SEIS, the staff:

- placed a copy of the draft SEIS in the NRC's electronic Public Document Room, its license renewal website, and at the Athens Limestone Public Library in Athens, Alabama,
- sent copies of the draft SEIS to the applicant, members of the public who requested copies, and certain Federal, State, Native American Tribal, and local agencies,

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- published a notice of availability of the draft SEIS in the *Federal Register* on December 10, 2004 (69 FR 71855),
- issued public announcements, such as advertisements in local newspapers and postings in public places, of the availability of the draft SEIS,
- announced and held public meetings in Athens, Alabama, on January 25, 2005, to describe the results of the environmental review- and answer-related questions,
- issued public service announcements and press releases announcing the issuance of the draft SEIS, the public meetings, and instructions on how to comment on the draft SEIS,
- established an e-mail address to receive comments on the draft SEIS through the Internet.

During the draft SEIS comment period, the staff received a total of six comment letters. Several commenters spoke during the public meetings. The staff reviewed the public meeting transcripts and the comment letters that are part of the docket file for the application, all of which are available in the NRC's Agencywide Documents Access Management System (ADAMS). ADAMS is accessible at <http://www.nrc.gov/reading-rm/adams.html>. The ADAMS accession number for the public meeting summary, which includes the complete meeting transcripts, is ML050620210. Appendix A, Part II, Section A.2, contains a summary of the comments and the staff's responses. Appendix A, Part II, Section A.3, contains copies of the public meetings transcripts and the comment letters.

Each comment identified by the staff was assigned a specific alpha-numeric identifier (marker). That identifier is typed in the margin of the letter at the beginning of the discussion of the comment. A cross-reference of the alpha-numeric identifiers, the author of the comment, the page where the comment can be found, and the section(s) of this report in which the comment is addressed is provided in Table A-2. The six written comment letters are identified by the letters K through P. The accession number is provided for the written comments after the letter date to facilitate access to the document through ADAMS.

Table A-2. Comments Received on the Draft SEIS

Commenter ID	Commenter	Comment Source and ADAMS Accession Number	Page of Comment	Section(s) Where Addressed
BF-D-A-1	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-89	A.2.22
BF-D-A-2	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-99	A.2.5
BF-D-A-3	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-99	A.2.22
BF-D-A-4	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-99	A.2.22
BF-D-A-5	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-99	A.2.22
BF-D-A-6	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-100	A.2.22
BF-D-A-7	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-100	A.2.6
BF-D-A-8	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-100	A.2.22
BF-D-A-9	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-100	A.2.6
BF-D-A-10	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-100	A.2.6
BF-D-A-11	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-100	A.2.6
BF-D-A-12	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-100	A.2.6
BF-D-A-13	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-101	A.2.22
BF-D-A-14	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-101	A.2.6
BF-D-A-15	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-101	A.2.5
BF-D-A-16	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-101	A.2.22
BF-D-A-17	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-101	A.2.22
BF-D-A-18	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-101	A.2.5
BF-D-A-19	Ann Harris, Sierra Club	Afternoon Transcript, ML050620210	A-107	A.2.22

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Table A-2. (contd)

<b>Commenter ID</b>	<b>Commenter</b>	<b>Comment Source and ADAMS Accession Number</b>	<b>Page of Comment</b>	<b>Section(s) Where Addressed</b>
BF-D-B-1	Chuck Wilson, TVA	Afternoon Transcript, ML050620210	A-94	A.2.1
BF-D-B-2	Chuck Wilson, TVA	Afternoon Transcript, ML050620210	A-94	A.2.1
BF-D-C-1	James Speegle	Afternoon Transcript, ML050620210	A-95	A.2.22
BF-D-C-2	James Speegle	Afternoon Transcript, ML050620210	A-95	A.2.2
BF-D-C-3	James Speegle	Afternoon Transcript, ML050620210	A-95	A.2.22
BF-D-C-4	James Speegle	Afternoon Transcript, ML050620210	A-95	A.2.18
BF-D-C-5	James Speegle	Afternoon Transcript, ML050620210	A-95	A.2.22
BF-D-C-6	James Speegle	Afternoon Transcript, ML050620210	A-96	A.2.22
BF-D-C-7	James Speegle	Afternoon Transcript, ML050620210	A-96	A.2.22
BF-D-C-8	James Speegle	Afternoon Transcript, ML050620210	A-96	A.2.1
BF-D-C-9	James Speegle	Afternoon Transcript, ML050620210	A-96	A.2.22
BF-D-C-10	James Speegle	Afternoon Transcript, ML050620210	A-96	A.2.17
BF-D-C-11	James Speegle	Afternoon Transcript, ML050620210	A-96	A.2.22
BF-D-C-12	James Speegle	Afternoon Transcript, ML050620210	A-96	A.2.22
BF-D-C-13	James Speegle	Afternoon Transcript, ML050620210	A-97	A.2.22
BF-D-C-14	James Speegle	Afternoon Transcript, ML050620210	A-97	A.2.22
BF-D-C-15	James Speegle	Afternoon Transcript, ML050620210	A-97	A.2.22
BF-D-C-16	James Speegle	Afternoon Transcript, ML050620210	A-97	A.2.22
BF-D-C-17	James Speegle	Afternoon Transcript, ML050620210	A-98	A.2.22

Table A-2. (contd)

Commenter ID	Commenter	Comment Source and ADAMS Accession Number	Page of Comment	Section(s) Where Addressed
BF-D-C-18	James Speegle	Afternoon Transcript, ML050620210	A-98	A.2.22
BF-D-D-1	Dawn Knox	Afternoon Transcript, ML050620210	A-102	A.2.22
BF-D-D-2	Dawn Knox	Afternoon Transcript, ML050620210	A-102	A.2.22
BF-D-D-3	Dawn Knox	Afternoon Transcript, ML050620210	A-102	A.2.20
BF-D-E-1	Stewart Horn	Afternoon Transcript, ML050620210	A-103	A.2.22
BF-D-E-2	Stewart Horn	Afternoon Transcript, ML050620210	A-103	A.2.22
BF-D-E-3	Stewart Horn	Afternoon Transcript, ML050620210	A-103	A.2.22
BF-D-E-4	Stewart Horn	Afternoon Transcript, ML050620210	A-104	A.2.6
BF-D-E-5	Stewart Horn	Afternoon Transcript, ML050620210	A-104	A.2.10
BF-D-E-6	Stewart Horn	Afternoon Transcript, ML050620210	A-104	A.2.6
BF-D-E-7	Stewart Horn	Afternoon Transcript, ML050620210	A-104	A.2.22
BF-D-E-8	Stewart Horn	Afternoon Transcript, ML050620210	A-104	A.2.22
BF-D-E-9	Stewart Horn	Afternoon Transcript, ML050620210	A-104	A.2.22
BF-D-E-10	Stewart Horn	Afternoon Transcript, ML050620210	A-104	A.2.22
BF-D-E-11	Stewart Horn	Afternoon Transcript, ML050620210	A-105	A.2.6
BF-D-F-1	Ralph Timberlake	Afternoon Transcript, ML050620210	A-105	A.2.6
BF-D-F-2	Ralph Timberlake	Afternoon Transcript, ML050620210	A-105	A.2.4
BF-D-F-3	Ralph Timberlake	Afternoon Transcript, ML050620210	A-105	A.2.22

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Table A-2. (contd)

Commenter ID	Commenter	Comment Source and ADAMS Accession Number	Page of Comment	Section(s) Where Addressed
BF-D-F-5	Ralph Timberlake	Afternoon Transcript, ML050620210	A-105	A.2.4
BF-D-F-6	Ralph Timberlake	Afternoon Transcript, ML050620210	A-106	A.2.3
BF-D-F-7	Ralph Timberlake	Afternoon Transcript, ML050620210	A-106	A.2.17
BF-D-F-8	Ralph Timberlake	Afternoon Transcript, ML050620210	A-106	A.2.9
BF-D-F-9	Ralph Timberlake	Afternoon Transcript, ML050620210	A-106	A.2.3
BF-D-F-10	Ralph Timberlake	Afternoon Transcript, ML050620210	A-106	A.2.6
BF-D-F-11	Ralph Timberlake	Afternoon Transcript, ML050620210	A-107	A.2.4
BF-D-G-1	Nancy Muse	Evening Transcript, ML050620210	A-121	A.2.18
BF-D-G-2	Nancy Muse	Evening Transcript, ML050620210	A-126	A.2.22
BF-D-G-3	Nancy Muse	Evening Transcript, ML050620210	A-126	A.2.4
BF-D-G-4	Nancy Muse	Evening Transcript, ML050620210	A-127	A.2.19
BF-D-G-5	Nancy Muse	Evening Transcript, ML050620210	A-127	A.2.22
BF-D-G-6	Nancy Muse	Evening Transcript, ML050620210	A-127	A.2.3
BF-D-G-7	Nancy Muse	Evening Transcript, ML050620210	A-128	A.2.19
BF-D-G-8	Nancy Muse	Evening Transcript, ML050620210	A-128	A.2.19
BF-D-G-9	Nancy Muse	Evening Transcript, ML050620210	A-132	A.2.17
BF-D-G-10	Nancy Muse	Evening Transcript, ML050620210	A-132	A.2.17
BF-D-G-11	Nancy Muse	Evening Transcript, ML050620210	A-133	A.2.3
BF-D-G-12	Nancy Muse	Evening Transcript, ML050620210	A-134	A.2.20

Table A-2. (contd)

Commenter ID	Commenter	Comment Source and ADAMS Accession Number	Page of Comment	Section(s) Where Addressed
BF-D-H-1	Jackie Tipper	Evening Transcript, ML050620210	A-129	A.2.19
BF-D-H-2	Jackie Tipper	Evening Transcript, ML050620210	A-129	A.2.22
BF-D-H-3	Jackie Tipper	Evening Transcript, ML050620210	A-129	A.2.16
BF-D-H-4	Jackie Tipper	Evening Transcript, ML050620210	A-129	A.2.22
BF-D-H-5	Jackie Tipper	Evening Transcript, ML050620210	A-130	A.2.20
BF-D-H-6	Jackie Tipper	Evening Transcript, ML050620210	A-131	A.2.19
BF-D-H-7	Jackie Tipper	Evening Transcript, ML050620210	A-131	A.2.18
BF-D-H-8	Jackie Tipper	Evening Transcript, ML050620210	A-131	A.2.20
BF-D-H-9	Jackie Tipper	Evening Transcript, ML050620210	A-131	A.2.22
BF-D-H-10	Jackie Tipper	Evening Transcript, ML050620210	A-131	A.2.19
BF-D-H-11	Jackie Tipper	Evening Transcript, ML050620210	A-132	A.2.22
BF-D-I-1	Chuck Wilson, TVA	Evening Transcript, ML050620210	A-131	A.2.1
BF-D-I-2	Chuck Wilson, TVA	Evening Transcript, ML050620210	A-131	A.2.1
BF-D-J-1	Grant Dasney	Evening Transcript, ML050620210	A-133	A.2.22
BF-D-K-1	Stewart Horn	Letter, ML050620210	A-109	A.2.22
BF-D-K-2	Stewart Horn	Letter, ML050620210	A-109	A.2.22
BF-D-K-3	Stewart Horn	Letter, ML050620210	A-109	A.2.22
BF-D-K-4	Stewart Horn	Letter, ML050620210	A-109	A.2.6
BF-D-K-5	Stewart Horn	Letter, ML050620210	A-109	A.2.22
BF-D-K-6	Stewart Horn	Letter, ML050620210	A-109	A.2.6
BF-D-K-7	Stewart Horn	Letter, ML050620210	A-109	A.2.22
BF-D-K-8	Stewart Horn	Letter, ML050620210	A-110	A.2.22
BF-D-K-9	Stewart Horn	Letter, ML050620210	A-110	A.2.22
BF-D-K-10	Stewart Horn	Letter, ML050620210	A-110	A.2.22



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Table A-2. (contd)

Commenter ID	Commenter	Comment Source and ADAMS Accession Number	Page of Comment	Section(s) Where Addressed
BF-D-K-11	Stewart Horn	Letter, ML050620210	A-110	A.2.6
BF-D-L-1	Ann Harris, Sierra Club	Letter, ML050620210	A-111	A.2.5
BF-D-L-2	Ann Harris, Sierra Club	Letter, ML050620210	A-111	A.2.22
BF-D-L-3	Ann Harris, Sierra Club	Letter, ML050620210	A-111	A.2.22
BF-D-L-4	Ann Harris, Sierra Club	Letter, ML050620210	A-111	A.2.22
BF-D-L-5	Ann Harris, Sierra Club	Letter, ML050620210	A-111	A.2.22
BF-D-L-6	Ann Harris, Sierra Club	Letter, ML050620210	A-111	A.2.6
BF-D-L-7	Ann Harris, Sierra Club	Letter, ML050620210	A-111	A.2.22
BF-D-L-8	Ann Harris, Sierra Club	Letter, ML050620210	A-111	A.2.6
BF-D-L-9	Ann Harris, Sierra Club	Letter, ML050620210	A-111	A.2.6
BF-D-M-1	John Formicola, TVA	Letter, ML050630390	A-136	A.2.20
BF-D-M-2	John Formicola, TVA	Letter, ML050630390	A-136	A.2.7
BF-D-M-3	John Formicola, TVA	Letter, ML050630390	A-136	A.2.21
BF-D-M-4	John Formicola, TVA	Letter, ML050630390	A-136	A.2.21
BF-D-M-5	John Formicola, TVA	Letter, ML050630390	A-136	A.2.21
BF-D-M-6	John Formicola, TVA	Letter, ML050630390	A-136	A.2.21
BF-D-M-7	John Formicola, TVA	Letter, ML050630390	A-137	A.2.21
BF-D-M-8	John Formicola, TVA	Letter, ML050630390	A-137	A.2.13
BF-D-M-9	John Formicola, TVA	Letter, ML050630390	A-137	A.2.13
BF-D-M-10	John Formicola, TVA	Letter, ML050630390	A-137	A.2.11
BF-D-M-11	John Formicola, TVA	Letter, ML050630390	A-137	A.2.21
BF-D-M-12	John Formicola, TVA	Letter, ML050630390	A-137	A.2.10
BF-D-M-13	John Formicola, TVA	Letter, ML050630390	A-138	A.2.21
BF-D-M-14	John Formicola, TVA	Letter, ML050630390	A-138	A.2.21
BF-D-M-15	John Formicola, TVA	Letter, ML050630390	A-138	A.2.21
BF-D-M-16	John Formicola, TVA	Letter, ML050630390	A-138	A.2.21
BF-D-M-17	John Formicola, TVA	Letter, ML050630390	A-138	A.2.21
BF-D-M-18	John Formicola, TVA	Letter, ML050630390	A-138	A.2.21
BF-D-M-19	John Formicola, TVA	Letter, ML050630390	A-138	A.2.21
BF-D-M-20	John Formicola, TVA	Letter, ML050630390	A-138	A.2.11
BF-D-M-21	John Formicola, TVA	Letter, ML050630390	A-138	A.2.11
BF-D-M-22	John Formicola, TVA	Letter, ML050630390	A-138	A.2.11
BF-D-M-23	John Formicola, TVA	Letter, ML050630390	A-138	A.2.11
BF-D-M-24	John Formicola, TVA	Letter, ML050630390	A-138	A.2.11
BF-D-M-25	John Formicola, TVA	Letter, ML050630390	A-139	A.2.17
BF-D-M-26	John Formicola, TVA	Letter, ML050630390	A-139	A.2.16

Table A-2. (contd)

Commenter ID	Commenter	Comment Source and ADAMS Accession Number	Page of Comment	Section(s) Where Addressed
BF-D-M-27	John Formicola, TVA	Letter, ML050630390	A-139	A.2.19
BF-D-M-28	John Formicola, TVA	Letter, ML050630390	A-139	A.2.14
BF-D-M-29	John Formicola, TVA	Letter, ML050630390	A-139	A.2.16
BF-D-M-30	John Formicola, TVA	Letter, ML050630390	A-139	A.2.16
BF-D-M-31	John Formicola, TVA	Letter, ML050630390	A-140	A.2.16
BF-D-M-32	John Formicola, TVA	Letter, ML050630390	A-140	A.2.16
BF-D-M-33	John Formicola, TVA	Letter, ML050630390	A-140	A.2.16
BF-D-M-34	John Formicola, TVA	Letter, ML050630390	A-140	A.2.16
BF-D-M-35	John Formicola, TVA	Letter, ML050630390	A-140	A.2.13
BF-D-M-36	John Formicola, TVA	Letter, ML050630390	A-140	A.2.9
BF-D-M-37	John Formicola, TVA	Letter, ML050630390	A-141	A.2.21
BF-D-M-38	John Formicola, TVA	Letter, ML050630390	A-141	A.2.10
BF-D-M-39	John Formicola, TVA	Letter, ML050630390	A-141	A.2.10
BF-D-M-40	John Formicola, TVA	Letter, ML050630390	A-141	A.2.16
BF-D-M-41	John Formicola, TVA	Letter, ML050630390	A-141	A.2.16
BF-D-M-42	John Formicola, TVA	Letter, ML050630390	A-141	A.2.16
BF-D-M-43	John Formicola, TVA	Letter, ML050630390	A-141	A.2.16
BF-D-M-44	John Formicola, TVA	Letter, ML050630390	A-141	A.2.15
BF-D-M-45	John Formicola, TVA	Letter, ML050630390	A-141	A.2.21
BF-D-M-46	John Formicola, TVA	Letter, ML050630390	A-142	A.2.21
BF-D-M-47	John Formicola, TVA	Letter, ML050630390	A-142	A.2.10
BF-D-M-48	John Formicola, TVA	Letter, ML050630390	A-143	A.2.10
BF-D-M-49	John Formicola, TVA	Letter, ML050630390	A-143	A.2.21
BF-D-M-50	John Formicola, TVA	Letter, ML050630390	A-143	A.2.13
BF-D-M-51	John Formicola, TVA	Letter, ML050630390	A-143	A.2.21
BF-D-M-52	John Formicola, TVA	Letter, ML050630390	A-143	A.2.13
BF-D-M-53	John Formicola, TVA	Letter, ML050630390	A-144	A.2.13
BF-D-M-54	John Formicola, TVA	Letter, ML050630390	A-144	A.2.13
BF-D-M-55	John Formicola, TVA	Letter, ML050630390	A-144	A.2.20
BF-D-M-56	John Formicola, TVA	Letter, ML050630390	A-144	A.2.16
BF-D-M-57	John Formicola, TVA	Letter, ML050630390	A-144	A.2.16
BF-D-M-58	John Formicola, TVA	Letter, ML050630390	A-144	A.2.20
BF-D-M-60	John Formicola, TVA	Letter, ML050630390	A-145	A.2.21
BF-D-M-61	John Formicola, TVA	Letter, ML050630390	A-145	A.2.21
BF-D-M-62	John Formicola, TVA	Letter, ML050630390	A-145	A.2.21
BF-D-M-63	John Formicola, TVA	Letter, ML050630390	A-145	A.2.21

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Table A-2. (contd)

Commenter ID	Commenter	Comment Source and ADAMS Accession Number	Page of Comment	Section(s) Where Addressed
BF-D-M-64	John Formicola, TVA	Letter, ML050630390	A-145	A.2.20
BF-D-M-65	John Formicola, TVA	Letter, ML050630390	A-145	A.2.20
BF-D-M-66	John Formicola, TVA	Letter, ML050630390	A-145	A.2.21
BF-D-M-67	John Formicola, TVA	Letter, ML050630390	A-146	A.2.20
BF-D-M-68	John Formicola, TVA	Letter, ML050630390	A-146	A.2.10
BF-D-M-69	John Formicola, TVA	Letter, ML050630390	A-146	A.2.10
BF-D-M-71	John Formicola, TVA	Letter, ML050630390	A-146	A.2.12
BF-D-M-72	John Formicola, TVA	Letter, ML050630390	A-146	A.2.21
BF-D-N-1	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-148	A.2.9
BF-D-N-2	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-148	A.2.13
BF-D-N-3	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-149	A.2.9
BF-D-N-4	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-149	A.2.9
BF-D-N-5	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-149	A.2.9
BF-D-N-6	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-149	A.2.9
BF-D-N-7	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-150	A.2.9
BF-D-N-8	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-150	A.2.9
BF-D-N-9	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-151	A.2.9
BF-D-N-10	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-152	A.2.11
BF-D-N-11	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-152	A.2.9
BF-D-N-12	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-153	A.2.9
BF-D-N-13	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-153	A.2.13
BF-D-N-14	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-153	A.2.10
BF-D-N-15	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-153	A.2.13

Table A-2. (contd)

Commenter ID	Commenter	Comment Source and ADAMS Accession Number	Page of Comment	Section(s) Where Addressed
BF-D-N-16	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-153	A.2.9
BF-D-N-17	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-153	A.2.9
BF-D-N-18	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-153	A.2.9
BF-D-N-19	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-153	A.2.13
BF-D-N-20	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-153	A.2.10
BF-D-N-21	Gregory Hogue, U.S. Department of Interior	Letter, ML050630415	A-153	A.2.11
BF-D-O-1	Michele Boyd, Public Citizen, and Sara Barczak, Southern Alliance for Clean Energy	Letter, ML050630419	A-159	A.2.22
BF-D-O-2	Michele Boyd, Public Citizen, and Sara Barczak, Southern Alliance for Clean Energy	Letter, ML050630419	A-159	A.2.22
BF-D-O-3	Michele Boyd, Public Citizen, and Sara Barczak, Southern Alliance for Clean Energy	Letter, ML050630419	A-160	A.2.22
BF-D-O-4	Michele Boyd, Public Citizen, and Sara Barczak, Southern Alliance for Clean Energy	Letter, ML050630419	A-161	A.2.8
BF-D-O-5	Michele Boyd, Public Citizen, and Sara Barczak, Southern Alliance for Clean Energy	Letter, ML050630419	A-161	A.2.13
BF-D-O-6	Michele Boyd, Public Citizen, and Sara Barczak, Southern Alliance for Clean Energy	Letter, ML050630419	A-161	A.2.22

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Table A-2. (contd)

Commenter ID	Commenter	Comment Source and ADAMS Accession Number	Page of Comment	Section(s) Where Addressed
BF-D-O-7	Michele Boyd, Public Citizen, and Sara Barczak, Southern Alliance for Clean Energy	Letter, ML050630419	A-161	A.2.20
BF-D-O-8	Michele Boyd, Public Citizen, and Sara Barczak, Southern Alliance for Clean Energy	Letter, ML050630419	A-160	A.2.19
BF-D-O-9	Michele Boyd, Public Citizen, and Sara Barczak, Southern Alliance for Clean Energy	Letter, ML050630419	A-162	A.2.20
BF-D-P-1	Heinz Mueller, U.S. Environmental Protection Agency	Letter, ML050700107	A-156	A.2.19
BF-D-P-2	Heinz Mueller, U.S. Environmental Protection Agency	Letter, ML050700107	A-156	A.2.13
BF-D-P-3	Heinz Mueller, U.S. Environmental Protection Agency	Letter, ML050700107	A-157	A.2.1

## A.2 Comments and Responses

Comments in this section are grouped in the following categories:

- A.2.1 General Comments in Support of License Renewal at Browns Ferry Nuclear Plant
- A.2.2 General Comments in Support of Nuclear Power
- A.2.3 General Comments in Opposition to License Renewal at Browns Ferry Nuclear Plant
- A.2.4 General Comments in Opposition to Nuclear Power
- A.2.5 General Comments in Opposition to NRC's License Renewal Process
- A.2.6 Comments Concerning NRC's Administrative Process
- A.2.7 Comment Concerning National Environmental Policy Act of 1969 (NEPA) Compliance
- A.2.8 Comments Concerning Decommissioning
- A.2.9 Comments Concerning Aquatic Ecology
- A.2.10 Comments Concerning Terrestrial Ecology
- A.2.11 Comments Concerning Threatened or Endangered Species
- A.2.12 Comments Concerning Groundwater Use and Quality
- A.2.13 Comments Concerning Surface-Water Use and Quality
- A.2.14 Comments Concerning Land Use
- A.2.15 Comments Concerning Cultural Resources
- A.2.16 Comments Concerning Socioeconomics
- A.2.17 Comments Concerning Human Health and Radiological Impact
- A.2.18 Comments Concerning Postulated Accidents
- A.2.19 Comments Concerning the Uranium Fuel Cycle and Waste Management
- A.2.20 Comments Concerning Alternatives
- A.2.21 Editorial Comments
- A.2.22 Comments Concerning Issues Outside the Scope of the Environmental Review for License Renewal: Aging Management, Blended Low Enriched Uranium Fuel, Cost of Power, Operational Safety, Restart of Browns Ferry Unit 1, and Safeguards and Security

### A.2.1 General Comments in Support of License Renewal at Browns Ferry Nuclear Plant

**Comment:** Browns Ferry Unit 2 and 3 run efficient. They run clean; they run good. BF-D-C-8

**Comment:** Being a Federal agency, in the spring of 2002 TVA prepared its own environmental impact statement addressing Browns Ferry License Renewal, and Browns Ferry Unit 1 restart. There were no significant environmental impacts, and license renewal was found to allow power production without greenhouse gases, which is consistent with TVA's clean air initiatives. It also maximizes use of existing assets and avoids the impacts of new site construction. So, our overall conclusion at that time that it was an environmentally sound thing to do. BF-D-B-2

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**Comment:** TVA agrees with NRC's overall conclusion that the environmental impacts of Browns Ferry License Renewal are minimal. BF-D-B-1

**Comment:** TVA agrees with NRC's basic overall conclusion that the environmental impacts of Browns Ferry License Renewal are minimal. BF-D-I-1

**Comment:** In the spring of 2002 we completed our own environmental impact statement, which addressed Browns Ferry License Renewal and Browns Ferry Unit 1 restart. There were no significant environmental impacts, and we did find that, in general, license renewal allows power production without greenhouse gases, which is consistent with TVA's clean air initiatives that you hear so much about. License renewal also maximizes use of existing assets and it avoids the impacts of new site construction. So, in general, we fully supported renewing the licenses of Browns Ferry as a good thing to do. BF-D-I-2

**Comment:** In conclusion, the document states that the OL renewal would result in fewer environmental impacts than the feasible alternatives for generating power, and the NRC considers impacts of OL renewal to be small. Overall, the impacts as defined in the DGSEIS appear to be within acceptable limits. BF-D-P-3

**Response:** *The comments are supportive of license renewal at Browns Ferry and are general in nature. The comments provide no new and significant information; therefore, no changes were made to the SEIS text.*

### A.2.2 General Comments in Support of Nuclear Power

**Comment:** And nobody needs to sit here and think I'm against nuclear power. I'm not. We got to have it. We got to have energy. BF-D-C-2

**Response:** *The comment is supportive of nuclear power and is general in nature. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

### A.2.3 General Comments in Opposition to License Renewal at Browns Ferry Nuclear Power Plant

**Comment:** And I'm not blaming any one person in this room because you're doing your job. The technology is here. We did not invent it; we're dealing with it. But I think it is time to phase it out and I would like for everyone in this room to please consider looking at options to restarting these plants. BF-D-G-6

**Comment:** Hopefully, the pristine area that we reside in here will be maintained. Though we are in an agrarian area, per se, except for probably Redstone, we would like to retain that. We would like to believe that we are going to have these pristine trees, we're going to have viable fisheries and other means of transportation to which these two reactor – this reactor which you are talking about today could have a severe impact and, then, we are going to be back discussing probably again Bellefonte, if that's going to have an impact. BF-D-F-9

**Comment:** I would like to say that given the fact that information is very difficult to obtain through the bureaucracy that this license renewal should be withheld. I do not think that the track record of TVA warrants us a renewal, based on not unequivocal answers. BF-D-F-6

**Comment:** I'm against TVA's future commitment, or present commitment also, to the nuclear program, regardless of the specific information within the environmental assessment and/or environmental impact statement. BF-D-G-11

**Response:** *The comments oppose license renewal at Browns Ferry and are general in nature. The comments do not provide new and significant information; therefore, no changes were made to the SEIS text.*

#### **A.2.4 General Comments in Opposition to Nuclear Power**

**Comment:** We have politicians who are unopposed to nuclear energy and nuclear power who suppress the stark, cold reality (static). BF-D-G-3

**Comment:** We need peace in this valley, and that nuclear plant out there is not only a target for everything else, it is the source of contention right now. BF-D-F-11

**Comment:** Nuclear power, though we should not be afraid, is not something that we can control. We do not fully understand it. We're talking about 20,000 years before it is fully decayed and, then, we don't know if it is going to be safe. It is all speculation. BF-D-F-5

**Comment:** I'm a proponent being against nuclear power. BF-D-F-2

**Response:** *The comments oppose nuclear power and are general in nature. The comments provide no new and significant information; therefore, no changes were made to the SEIS text.*

#### **A.2.5 General Comments in Opposition to NRC's License Renewal Process**

**Comment:** I am here today because I find that the NRC staff does not have a low that they will stop at to bend over for the nuclear industry. BF-D-L-1 and BF-D-A-2



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**Comment:** In my 21 years of dealing with you boys, I still cannot trust you with public health and safety. How sad you are. BF-D-A-18

**Comment:** All the time and words in the world will never heal the continued incompetence of the NRC staff and Commission. Your continued refusal to perform your jobs is a clear indicator that the NRC will continue to put public health and safety below industry financial support. The time will soon come when your actions will come to hit you in the seat of the pants as you leave a nuclear site. BF-D-A-15

**Response:** *The comments oppose NRC's license renewal process and are general in nature. The comments provide no new and significant information; therefore, no changes were made to the SEIS text.*

### **A.2.6 Comments Concerning NRC's Administrative Processes**

**Comment:** I went to the Athens Library to try to determine how many automatic shutdowns had occurred at Browns Ferry. The historical NRC Browns Ferry files are no longer there. I called NRC. They told me that the information would be available through the online NRC public documentation system. I struggled to try to find the data online, but eventually gave up after suffering severe frustration. I then called NRC and requested that someone there find the data for me, but I never received any information. BF-D-E-4 and BF-D-K-4

**Response:** *Information from NRC's document system, the Agencywide Documents Access and Management System (ADAMS), is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. ADAMS is an information system that provides access to all image and text documents that the NRC has made public since November 1, 1999, as well as bibliographic records (some with abstracts and full text) that the NRC made public before November 1999. There is a fee to have materials copied and shipped. Information regarding fees and turnaround times can be found at <http://www.nrc.gov/reading-rm/pdr/copy-service.html>. Additionally, staff at the Public Document Room will provide assistance in locating or obtaining documents in ADAMS. They can be reached at [PDR@nrc.gov](mailto:PDR@nrc.gov) or by phone at 1-800-397-4209 or 301-415-4737, by fax at 301-415-3548, by mail at NRC, PDR, O1F13, Washington, DC 20555. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** Have you already renewed the operating license of this reactor, or have you informed TVA that approval of license renewal is guaranteed? The TVA has spent \$885,000,000 on this project, and it is beyond belief that they would have done such a thing if there may be the remotest possibility that approval might not be forthcoming. If approval has not already been granted or is not guaranteed, has the NRC encouraged the TVA to initiate work on this project under these circumstances? BF-D-E-11 and BF-D-K-11

**Response:** *The NRC makes the decision to grant or deny a license renewal based on whether the applicant has demonstrated that the environmental and safety requirements in the NRC's regulations can be met during the license renewal term. If the applicant meets the requirements given in the regulations, then the NRC can be expected to approve renewal of the license. The NRC can deny an applicant's request to renew a license; however, the process to renew a license is an iterative process, such that if the applicant did not provide appropriate or adequate information in its initial application, the NRC would identify the deficiencies and the applicant would be allowed to resubmit the application. This process could continue, and has continued, until the NRC concludes that the application is sufficient to complete the review. Furthermore, if it appeared to the applicant that the NRC might deny the request for license renewal, the applicant would likely withdraw the request in advance of the formal denial. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** If we can somehow restore the public trust in our officials, if we cannot trust our officials, which seems from the comment earlier, we cannot, something needs to be done. I would entreat you to take the time, those that are in authority and those that are receiving our trust and our funds from our taxes, would take time to try to restore public confidence and trust in you. If we don't trust you, it is going to be a problem. And, then, surely reprisals should be a horror to all of us sitting here. If the people, which we are a people-driven government, let us understand that – you cannot be everywhere at one time. If the eyes and ears of those that are willing to put their families and lives on the line are not rewarded, is not appreciated, we do ourselves and our posterity a great and horrendous disservice. So I beg you, beseech you that you somehow take time to look at these matters and do not be afraid for the sake of money 'cause no amount of money is worth the life of one single person. BF-D-F-10

**Comment:** It is with great sadness that I stand before you hearing such appalling reports that our citizens have laid against you, right or wrong. However, TVA, I know is an agency that has a very thick skin. No matter how much you tell them the truth, they seem to find ways to spin it differently. BF-D-F-1

**Comment:** I have recently taught adults at the junior college level and I cannot imagine having one of your written decisions given to me to grade. Let me tell you, you have failed my classes, since I have put forth a decision for class work on how not to do research and what failures you are on ethics, language and your responsibilities as government employees. BF-D-A-10 and BF-D-L-9

**Comment:** Somehow I will find a way to ask my U.S. Congressman to retrieve your salaries because of malfeasance in office. For the uneducated, it means intentional wrong doing. How can you deny your incompetence and continual actions that promote you as a laughing stock of the entire U.S.? Are you so incompetent that you can't find jobs elsewhere rather than become snake oil salesmen? I'm amazed. BF-D-A-11

## Appendix A

**Comment:** I give you further examples of your continued malfeasance...In the seventies, you were advised and carried a load of embarrassment into congressional hearings during the eighties about the abuse of employees by TVA management in direct violation of federal law. Now here we are today with the same boiler plate statement that TVA does not condone abuse over public health and safety. BF-D-A-12

**Comment:** I understand you boys are not concerned about money since your salaries will be paid regardless of whatever remarkably bad decision you produce. BF-D-A-7 and BF-D-L-6

**Comment:** And I pay particular attention to the so-called "official record" of the last meeting we had down here. Where you erased the part about how you would address the fuel issue that I questioned you on if you had the knowledge. Boys, it is time that you found new dictionaries and begin to read. The NRC takes its mission of protecting public health and safety and protection of the environment very seriously. BF-D-A-9 and BF-D-L-8

**Response:** *The NRC reviews applications and performs safety inspections in accordance with its regulations that are intended to protect public health and safety and the environment. The NRC takes its mission of protecting public health and safety and the environment very seriously. The NRC's Office of the Inspector General (OIG) was established as an independent and objective organization to detect fraud, waste, abuse, and mismanagement, and to promote economy, efficiency, and effectiveness in NRC programs and operations. The OIG Hotline (1-800-233-3497) is a convenient means of reporting specific incidents of waste, fraud, and malfeasance. The criticism is general in nature and provides no new and significant information; therefore, no changes were made to the SEIS text.*

**Comment:** I was told that the safety review meetings would be conducted in Washington, and I was not able to attend these. BF-D-E-6 and BF-D-K-6

**Response:** *All public meetings are announced in the Federal Register and on the NRC's website at <http://www.nrc.gov/public-involve/public-meetings/index.cfm>. Some technical meetings are held at NRC's headquarters near Washington, D.C., to best use limited agency resources. The NRC staff also conducts several safety inspections as part of its review of license renewal applications. Exit meetings regarding these safety inspections are typically held near the applicant's site and are open to the public. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** In 1993, when I found the infamous Memorandum of Understanding between TVA and NRC stating that the NRC would turn over to TVA management names of those raising safety issues to the NRC, I was embarrassed for you guys. And here we all are 12 years later and the practice in that agreement is still being carried out. Don't correct me. I know you cancelled the MOU, but you forgot to stop the practice. Do you boys here today know that TVA's record at the Department of Labor is the largest in the nation? And did you know that

you have never been able to stop that abuse because of your refusal to do your job?  
BF-D-A-14

**Response:** *NRC treats TVA as it does any other licensee regarding safety allegations and individuals making safety allegations. The names of individuals are not disclosed unless the individual agrees that his name can be released. In some cases the name of the individual must be revealed to the licensee if the NRC is to pursue the allegation, abuse, and/or employee or management misconduct (for instance, if a person claims that a particular fitness for duty case was mishandled, the licensee may need to know the particular case in order to provide the appropriate information). In such cases the individual is asked to give their approval if the NRC is to go forward with the investigation. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

#### **A.2.7 Comment Concerning National Environmental Policy Act (NEPA) Compliance**

**Comment:** Page 1-5, paragraph beginning Line 39: This paragraph makes no mention of how TVA, being a federal agency, fulfilled its own NEPA obligations by preparing a supplemental Environmental Impact Statement for Browns Ferry License Renewal. As explained in a letter dated June 4, 2004, to NRC from TVA's Mark Burzynski, Manager of Nuclear Licensing, each of the 92 license renewal environmental issues listed in NRC's GEIS and summarized in 10 CFR 51, Subpart A, Appendix B, Table B-1, were reviewed by TVA's various subject matter experts that were involved in preparing TVA's SEIS and the subsequent Environmental Report submitted by TVA as part of its application for BFN license renewal. BF-D-M-2

**Response:** *The text in Section 1.2.2 has been changed to indicate that TVA prepared its own EIS, and the preparation of that document contributed to the process of identifying new and significant information. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

#### **A.2.8 Comments Concerning Decommissioning**

**Comment:** The NRC should evaluate the decommissioning trust fund balances for TVA's Browns Ferry units and how decommissioning will be impacted by extending the operating licenses of all three units. The NRC should also ensure that sufficient decommissioning funds would be in place in order to protect utility ratepayers and taxpayers. According to a General Accounting Office (GAO) report in 2003, all of TVA's nuclear power plants were found to be below the benchmark of sufficiency for decommissioning trust fund balances with the Browns Ferry units being among nuclear plants with the poorest decommissioning fund status. This is extremely problematic. BF-D-O-4

**Response:** *The Commission has determined the status of the decommissioning trust fund is outside the scope of the environmental analysis for license renewal. However, in response to the comment, the regulations in 10 CFR 50.75 establish the requirements for reporting the*

*status of the licensees' decommissioning trust fund. On March 30, 2005, TVA submitted its most recent biannual decommissioning trust fund status report for BFN which is available online from ADAMS at <http://www.nrc.gov/reading-rm/adams.html>. The accession number for the status report is ML050940222. The TVA submittal will be reviewed by NRC staff for compliance with 10 CFR 50.75. NRC decommissioning cost-estimate formulas provided in 10 CFR 50.75(c) estimate that \$1.37 billion would be required for radiological decommissioning. As of the end of 2004, TVA had \$533 million in the decommissioning trust fund for BFN, which complies with the projected trust fund balance for this facility. Environmental impacts related to decommissioning are discussed in Section 7.0 of this SEIS. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

### **A.2.9 Comments Concerning Aquatic Ecology**

**Comment:** In addition to an examination of general conditions at individual sample sites, the detailed assessment should include an analysis of any episodically poor water-quality conditions and specific conditions in bottom waters. For instance, if dissolved oxygen levels drop for extended periods of time at, or near the stream bottom in the reservoir within, adjacent to, or within the mixing zone downstream of the effluent/diffuser site; benthic-dwelling species, such as mussels, could be severely impacted or killed. If a toxic substance was released through the diffusers in the reservoir, benthic species near, downstream, or within the mixing zone of BFN would likely be adversely affected. These are the conditions, although sometimes short-lived, which may, nonetheless, exert profound effects on aquatic organisms' health and viability, particularly of non-mobile species such as mussels and other invertebrate fauna.

BF-D-N-3

**Response:** *Plant operation is not expected to contribute to a reduction in dissolved oxygen levels at or near the bottom of the reservoir. Not only has this not been observed at BFN or at other nuclear power facilities, but no mechanism for the reduction of dissolved oxygen in a large volume of water near the reservoir bottom has been postulated. In any case, the applicant would be required to meet ADEM regulatory limits established in the NPDES permit. As addressed in Section 2.2.3, the permit specifies effluent limits for pH, total residual chlorine, oil, grease, biological oxygen demand, fecal coliforms, total suspended solids, temperature, naphthalene, and BTEX (i.e., benzene, ethyl benzene, toluene, and xylene isomers). Therefore, cooling water discharges through the diffusers would not be expected to adversely impact aquatic biota, even during episodic periods of low water quality within Wheeler Reservoir. Furthermore, the plume is buoyant and not near the bottom; therefore, there would be little or no impact to benthic organisms. Because they are able to close or clam-up, mussels tend to be tolerant of episodic events related to poor water quality. The ADEM also has the authority to modify the NPDES permit if it determines, through biological and/or water-quality monitoring, that more stringent limitations are necessary to ensure the protection and propagation of aquatic life in the Tennessee River. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** Quantify the diversity and abundance of organisms entrained by water withdrawal at all intake pipes and evaluate screening mesh size, low velocity intake, and other techniques to minimize entrainment. Quantification should occur at least monthly for the year of the study and for the year following screen changes. BF-D-N-12

**Comment:** We are concerned about uptake of aquatic organisms into the boiler reactor (sic) water by entrainment, including larvae and early life stages of federally protected mussels (if present), as well as other mussels, fish), phytoplankton, and zooplankton. Opportunities to divert fish from entrainment (e.g., strobe lights) and use of angled trash racks with sluiceways, and appropriate screens may mitigate for increased entrainment of larger fish and invertebrates, if incorporated into design plans. There may also be methods to minimize entrainment depending on depth of water withdrawal and location of water withdrawal structures. BF-D-N-4

**Response:** *Reducing the screen mesh size or reducing the intake velocity does not necessarily decrease the level of entrainment because most of the entrained organisms are small, passive creatures in the water column and would be entrained anyway. Additionally, decreasing the mesh size tends to increase the rate of impingement on the screens. The discussion on entrainment impacts presented in Section 4.1.2 is partly based on entrainment studies conducted at BFN from 1974 through 1979. During those years, entrainment samples were generally collected on a weekly basis between mid-March to late August (the period when fish eggs and larvae would be most abundant). Presentation of that information on a monthly basis would not have altered the conclusion presented in the SEIS that entrainment losses from the operation of BFN do not have a significant impact on the fish populations of Wheeler Reservoir. The permitting authority (ADEM) has determined that the current design is adequate and no mitigation is required. Any entrainment studies or design modification that may be required in the future to demonstrate compliance with EPA's Phase II performance standards (40 CFR Part 125, Subpart J) for intake structures at existing facilities would be under the review of ADEM, which has regulatory authority for the NPDES permit. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** Page 4-25, Lines 5 B 8: What is stated is correct, but it begs for an explanation of why the diffuser discharge temperature could be 0.3°F warmer for two-unit operation than for three-unit operation (both at EPU), even though three units obviously generate 50 percent more heat than two units. Although this is true, the maximum temperatures in the analyses correspond to open mode conditions creating a temperature of 90°F at the downstream end of the mixing zone (i.e., the NPDES limit). Since the plant releases less heat with two units than it does with three units, it can operate at higher ambient river temperatures (and thus a higher diffuser discharge temperature) with two units and still stay within the downstream mixing zone limit of 90°F. BF-D-M-36

**Response:** *The comment is noted, and text has been added in Section 4.1.5 to provide further explanation.*

## Appendix A

**Comment:** These ratings can be deceptive, however, giving the impression that the mussels and other invertebrates found at these locations are the desirable, native fauna. As mentioned in the draft GEIS, Asiatic clams, an introduced exotic species, can dominate benthic environments, competing for food, nutrients, and space with native benthic organisms and may feed directly on native, unionid sperm, glochidia, and newly metamorphosed juvenile mussels. Since its first detection in the Tennessee River system in the early 1960s, the Asiatic clam has increased in number and spread throughout the entire Tennessee River system. These data should be reanalyzed to determine if TVA's assessment is an accurate measure of conditions for the native aquatic biota, or native Federally or State-listed species in or adjacent to these sampling sites. BF-D-N-1

**Response:** *The presentation of benthic macroinvertebrate monitoring scores (part of the Vital Signs Monitoring Program conducted by TVA) was only one component of the information presented in the SEIS that described the status of the aquatic biota within the Wheeler Reservoir area. The Vital Signs Monitoring Program evaluated the potential aquatic impacts from the operation of BFN that could be evaluated in an appropriate context with other perturbations to which native biota are exposed (e.g., impoundments and introduced species). The remainder of Section 2.2.5, the cumulative impacts discussion in Section 4.8 (particularly Sections 4.8.1 and 4.8.6); and the biological assessment (Appendix E) fully address the impact that both introduced species and impoundment of the Tennessee River, as well as other stressors, have had upon the native biota of the Tennessee River. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** If you raise the water temperature in the water, in the rivers and other stream, it can have an impact, a severe and negative impact upon the wildlife that deals with this water, and the fishery and all the other animals and mammals that is within that water. How far down stream that's going to affect, no one took the time to deal with. BF-D-F-8

**Response:** *The allowable discharge temperatures are regulated under the BFN NPDES permit issued by ADEM. The State specifies an area of the river called "the mixing zone" that defines a region of elevated temperature. Outside the mixing zone, temperatures are not expected to be detrimental to aquatic organisms. The maximum size of the mixing zone for BFN is approximately 117 ac (47 ha) and extends about 732 m (2400 ft) downstream from the discharge pipes. The potential impacts of discharge water temperatures on fish and wildlife were thoroughly evaluated in Section 4.1.4. This comment provided no new and significant information, therefore, no change was made to the SEIS text.*

**Comment:** Reinitiate the ichthyoplankton characterization study done between the years of 1974 and 1979, prior to startup of BFN and continue a similar type study during the initial years of operations of the proposed up-rate of BFN's Units 1, 2, and 3. BF-D-N-11

**Response:** *The licensee will be required to demonstrate compliance with the new 316(b) Phase II performance standards (40 CFR Part 125, Subpart J) at the time of renewal of its*

current NPDES permit. TVA may be required to modify portions of the BFN intake structure or cooling system, modify station operations, or take other mitigative measures as a result of these new regulations as part of the NPDES permit renewal. Presumably, TVA may also be required to initiate an ichthyoplankton monitoring program to demonstrate that entrainment losses are reduced to the applicable performance standards. The facility-specific requirements will be determined by ADEM at the time of NPDES renewal. Any future mitigation required by ADEM would likely reduce the impact of BFN on aquatic organisms. The comment provided no new and significant information; therefore, no change was made to the SEIS text.

**Comment:** Boiler reactor (sic) water is subject to intense pressure, heat, and biocide treatment. The raw water intake for BFN is treated biannually with a molluscicide to control bio-fouling by zebra mussels and Asiatic clams. Raw water samples are taken biweekly during the months of April to September and analyzed for zebra mussels larvae as an early detection system aimed at reducing the potential bio-fouling of BFN's raw water intake structure. Without adequate screening and fish rack sluiceways, aquatic organisms taken up by entrainment into the intake pipe and subjected to such environment will be killed by these treatments. BF-D-N-5

**Response:** Use of biocides to control zebra mussels and other bio-fouling organisms is minimized at BFN. The primary means of preventing bio-fouling in the cooling system is via the continuous recirculation of small sponge rubber balls that scrub the piping and condenser tubes.

The intake structure is adequately screened to prevent the entrainment of fish and any other organisms larger than 0.95 cm (3/8 in.) from entering plant cooling systems. The effects of plant operation on the entrainment of fish and shellfish in early life stages, discussed in Section 4.1.2, were found to be a small impact even assuming 100 percent mortality of entrained organisms. The comment provides no new and significant information; therefore, no change was made to the SEIS text.

**Comment:** Hydrazine has been used to scavenge oxygen during blowdowns of cooling towers in an effort to help reduce oxidation from occurring in the towers. Discharges of this potential toxicant into the Tennessee River may cause more than detrimental effects to Federally listed mussels, if present, as well as many other aquatic organisms. The rate of degradation of hydrazine in water is highly dependent on factors such as pH, temperature, oxygen content, alkalinity, hardness, and the presence of organic material and metal ions. The toxicity of hydrazine increased for guppies in soft water (at pH<7.0) compared with the toxicity in hard water at pH ~8.0 (Slonim 1977), indicating increased persistence of hydrazine in soft, non-alkaline water such as that of Wheeler Reservoir (TVA 1971). Increased water temperature also enhances the toxicity of the compound for bluegills (Hunt et al. 1981) (<http://www.inchem.org/documents/ehc/ehc/ehc68.htm#SectionNumbers:5.1>). Because the Tennessee River at BFN's point of discharge is expected to have low alkalinity and elevated in-stream water temperatures due to BFN's thermal discharge, these conditions raise our



## Appendix A

concerns for the toxicity of hydrazine in the discharge, and its potential adverse effects on aquatic biota. BF-D-N-8

**Comment:** If hydrazine is determined to pose a risk to aquatic species (particularly mussels), eliminate discharge of hydrazine by designing a system for separating and containing hydrazine from all discharges to the Tennessee River/Wheeler Reservoir. BF-D-N-16

**Response:** *Hydrazine is currently used at BFN to control dissolved oxygen and thereby limit corrosion in two closed-loop systems: (1) in the auxiliary boilers, and (2) in the turbine building closed cooling water system (building heat). The only time the hydrazine can leave a closed system is during blowdown (i.e., a controlled release of pressurized hot water to allow replacement with clean water) or as the result of occasional leakage. However, hydrazine in the hot water system reacts very rapidly with the dissolved oxygen in the receiving turbine building sumps. Water from the sumps is processed by either the Thermex system or the Waste Filter/Waste Demineralizer prior to being routed to a monitored station outfall (DSN 001). During a past five-year period of monitoring, as required by a previous NPDES permit, no hydrazine was detected in the discharge from DSN 001, and the requirement to monitor releases for hydrazine was subsequently dropped from the current NPDES permit (issued February 1, 2001; expires January 31, 2006). The comments did not provide new and significant information; therefore, no changes were made to the SEIS text.*

**Comment:** If copper in bottom sediments appears to occur at concentrations above ecological risk levels, implement a plan to replace copper components at the plant with brass, titanium, or other typical replacement parts used by other nuclear power facilities to reduce copper. BF-D-N-17

**Response:** *The only significant source of copper in bottom sediments from nuclear plants is from brass cooling water condenser tubing. The original BFN Units 2 and 3 condenser tubing contained copper and has been replaced with stainless steel. The tubing in Unit 1 will have been replaced with stainless steel prior to the start of the license renewal term. The comment did not provide any new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** The toxicity of chlorine to aquatic life is a function of total residual chlorine (TRC), which includes both free chlorine and chloramines (Flora et al. 1984). Monitoring of free chlorine does not serve as an adequate indicator of the potential toxicity of facility effluents nor does it provide adequate data to avoid toxic effects to listed mussels. Therefore, TRC should be measured rather than free chlorine. BF-D-N-7

**Comment:** We are not sure what biocides are utilized at BFN; however, chlorine is often used in biocides. Chlorine is extremely toxic to a wide variety of freshwater organisms (Hunn and Schnick 1990). Safe concentrations (i.e., those that do not produce any lethal or sublethal effects) are likely much lower, especially considering the relatively sessile nature and long life

span of mussels relative to these short-term test exposures. Under longer-term exposures (>96 hours), lethality to fish and aquatic invertebrates has been documented at chlorine concentrations between 3.4 and 26 ug/L (EPA 1985). Because chlorine extreme toxicity, the EPA established a Federal ambient water quality criterion maximum concentration of 0.019 mg/L and a continuous concentration (CCC) of 0.011 mg/L for chlorine, respectively, to protect aquatic life (EPA 2002). Studies have shown that mussels are very similar in sensitivity to other sensitive aquatic organisms and that 0.019 mg/L is likely protective (Ingersoll 2003). To meet these limits, a dechlorination unit or use of alternatives such as UV or ozonation could be utilized. Alternatively, high flow rate velocity flushes, ultrasound, or robotic mechanical cleaning devices could occur on influent and effluent pipes. BF-D-N-6

**Comment:** Reduce or eliminate discharge of chlorine to the Tennessee River through use of a dechlorination unit for removal of chlorine before discharge. If there is a discharge of chlorine, then at least monitor TRC daily. To provide adequate protection of aquatic life, the permit should establish EPA criterion chronic concentrations of 0.011 mg of TRC per liter as a permit limitation for continuous discharges and monitor it daily. If chlorine treatments are intermittent, the criterion for protection of aquatic life from acute toxicity can be substituted. Mechanical cleaning (e.g., robotic) and flushing controls should be considered as an alternative to chlorine. BF-D-N-18

**Response:** *The primary means of preventing bio-fouling in the cooling system is via the continuous recirculation of small sponge rubber balls that scrub the piping and condenser tubes. Chlorine is not used in the main cooling water system, but it is used in some of the much smaller service water systems. The resulting discharge chlorine levels are within applicable NPDES limits, which are protective of aquatic organisms. The comments provided no new and significant information; therefore, no changes were made to the SEIS text.*

#### A.2.10 Comments Concerning Terrestrial Ecology

**Comment:** Page 2-44, Paragraph beginning Line 37: To be more accurate, the second sentence should be revised to state, "There are numerous invasive plants in the area (TVA 2003a), of which TVA has identified 19 as high priority, including Chinese privet, Japanese honeysuckle, Japanese knotweed, and Nepal grass." Also, the scientific name is included parenthetically for some plants in this sentence but not for others, which is inconsistent. BF-D-M-12

**Response:** *The text in Section 2.2.6 has been changed based on the information on invasive species provided in this comment. Following the standard convention, the scientific name of a species is provided in parenthesis after the first use of the common name in each section. Several species listed in the paragraph were called out in the previous paragraph and the scientific name was not repeated.*

**Comment:** Mowing should be timed to avoid periods of nesting ground birds. BF-D-N-14

## Appendix A

**Response:** *TVA removes low-growth vegetation on the transmission line corridors through bushhogging. TVA recognizes that this vegetation offers excellent nesting, brooding, escape, and shelter for various species of wildlife, including ground-nesting birds. Thus, scheduling is carefully designed for bushhogging activities to minimize impacts to species that might be using these areas. TVA maintains a policy of scheduling bushhogging activities before March 15 or after August 15. The comment provided no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** If herbicides are used, use Roundup Custom or Accord or similar low-toxicity, low-solubility herbicide, together with a low-toxicity surfactant such as LI700 or Agri-Dex in strict adherence to the label. Near streams and other water bodies, evaluate toxicity based on toxicity to aquatic species. BF-D-N-19

**Response:** *TVA selects herbicides based on the particular situation where it is needed, and is likely to vary depending on factors such as target species, and other considerations such as proximity to water bodies. All herbicide applications are performed under the supervision of licensed applicators, and product label instructions and use restrictions are carefully followed. The comment provided no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** Page 4-50, Sentence beginning Line 30: Clarification is needed. TVA does not work with its Right-of-Way (ROW) maintenance contractors to develop restrictions for the ROW contractors to follow; instead, TVA develops and establishes guidelines for the ROW contractors to follow. BF-D-M-48

**Response:** *The text in Section 4.6.2 has been changed based on the information provided in this comment.*

**Comment:** Periodically survey to determine if federally listed plant species have become established in rights-of-way. BF-D-N-20

**Response:** *TVA natural heritage staff regularly interact with natural heritage staff from all of the states within the TVA service area to identify new populations of rare or sensitive species within the TVA transmission line rights-of-way. The TVA natural heritage staff works with the TVA transmission line right-of-way maintenance organization to develop measures that will be protective of all of the unique or sensitive elements within the transmission line corridors. The comment provided no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** Page E-29, Line 30: The statement that "There is no broadcast application of herbicides" is not correct. TVA does use and expects to continue using broadcast and/or aerial herbicides in sections of transmission line rights-of-way where appropriate. BF-D-M-69

**Comment:** Page 4-27, Line 2: The statement that "There is no broadcast application of herbicides" is incorrect. TVA does use and expects to continue using broadcast and/or aerial herbicides in sections of transmission line corridors where appropriate. BF-D-M-39

**Response:** *The text in Section 4.2 has been changed to clarify that no broadcast herbicide applications are performed in Class 1 or Class 2 sensitive areas. Broadcast application of herbicides is permitted in areas not classified as sensitive. Although the text in Appendix E could be changed in the same manner, the Biological Assessment (BA) has already been submitted to the FWS and, therefore, will not be changed at this time.*

**Comment:** Page E-29, Paragraph beginning Line 23: The restriction class definitions vary depending on the type of maintenance and resource area being considered and do not necessarily agree with the simplified statements made here (see table of Class Definitions, pages E-562 and E-563 of Attachment E-6, Transmission Line Corridor Environmental Analysis, of the BFN License Renewal Environmental Report). BF-D-M-68

**Comment:** Page 4-26, Paragraph beginning Line 36: The restriction class definitions vary depending on the type of maintenance and resource area being considered and do not necessarily agree with the simplified statements made here (see table of Class Definitions, pages E-562 and E-563 of Attachment E-6, Transmission Line Corridor Environmental Analysis, of the BFN License Renewal Environmental Report). BF-D-M-38

**Response:** *The text in Section 4.2 has been changed to clarify the sensitive area classification system. Although the text in Appendix E could be changed in the same manner, the BA has already been submitted to the FWS and, therefore, will not be changed at this time.*

**Comment:** Page 4-50, Paragraph beginning Line 17: The following information updates that previously provided by TVA for Natural Areas crossed by transmission corridors or within 0.5 mile of the corridors. For clarity, it is recommended that the text specify the five transmission line corridors that were reviewed and note the ones with no Natural Areas. Note in particular that for Lines 23 and 24, the Duck River State Wildlife Management Area, the Duck River Unit 1 Proposed Designated Critical Habitat, and Elk River and Richland Creek are not appropriate to the scope of this document because these sites are not on the line segments shown on page 2-16 (i.e., only the first 23 miles of the 87-mile-long Browns Ferry to Maury line are included as applicable, and the sites are all on the last segments of the line).

**Browns Ferry-Maury 500-kV (L6060), Alabama**

- Philadelphia Glade (within 0.5 mile)
- Swan Creek State Wildlife Management Area (within 0.5 mile)

**Browns Ferry-Trinity 500-kV (L6078), Alabama**

- This TL corridor does not cross any Natural Areas
- Mallard-Fox Creek State Wildlife Management Area (within 0.5 mile)

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### Browns Ferry-Trinity 161-kV (L5054), Alabama

- This TL corridor does not cross any Natural Areas
- Mallard-Fox Creek State Wildlife Management Area (within 0.5 mile)

### Browns Ferry-Athens 161-kV (L5055), Alabama

- This TL corridor does not cross any Natural Areas.

### Browns Ferry-Union 500-kV (L6091)

- Mississippi-Natchez Trace National Parkway
- Canal Section Wildlife Management Area
- TN-TOM Lock D Pool Reservoir Reservation
- East Fork Tombigbee Macro Site
- John Bell Williams State Wildlife Management Area
- TN-TOM Lock E Pool Reservoir Reservation
- TN-TOM Waterway-Foxtrap Creek Ravine Potential National Natural Landmark
- Bear Creek Unit 2 Proposed Designated Critical Habitat
- Lake Lamar Bruce State Fishing Lake (within 0.5 mile). BF-D-M-47

**Response:** *The text in Section 4.6.2 has been changed to include the information provided in this comment.*

### A.2.11 Comments Concerning Threatened or Endangered Species

**Comment:** Page 2-55, Lines 7 and 8: Delete the portion of the sentence after “drainage canals” which discusses “forested habitats.” Gray bats don’t normally use forested habitats unless along a stream. BF-D-M-23

**Comment:** Page 2-55, Line 32: It is not accurate to refer to the Morgan County station for Hart’s-tongue fern as being in the southern portion of its range. This fern is highly disjunct, and while it has been found as far south as Mexico, it occurs nowhere in between the few AL/TN stations and Michigan. BF-D-M-24

**Response:** *The text was changed in Section 2.2.6 based on the information provided in these comments.*

**Comment:** Page 2-54, Lines 20 and 29: The statements in these two paragraphs about species being listed in various counties are potentially misleading, because they are threatened or endangered throughout their ranges, not just in these counties. BF-D-M-20

**Comment:** Page 2-55, Lines 1, 2, 13, 14, 23, 37, 38: Similar to the above comment on Page 2-54, Lines 20 and 29, the species discussed are threatened or endangered throughout their ranges, not just in these counties. BF-D-M-22

**Response:** *The text in Section 2.2.6 was changed to clarify that the listings apply throughout the species ranges.*

**Comment:** Page 2-54, Lines 24 and 25: The statement that "there is no known nesting habitat within 5 km (3 mi) of the site" is misleading because there is nesting habitat along the shoreline. A more accurate description would be that "although there is nesting habitat along the shoreline in the area around BFN, there are no known nests." BF-D-M-21

**Response:** *The text in Section 2.2.6 has been changed based on the information provided in the comment.*

**Comment:** Page 2-41, Lines 19-22: The Alabama cave shrimp discussion should be moved to the federal endangered species section. BF-D-M-10

**Response:** *The Alabama cave shrimp should have been included in the discussion of Federal listed species. The text in Section 2.2.6 has been changed based on the information provided in the comment.*

**Comment:** We remain concerned about BFN's practice of controlling vegetation in the transmission line rights-of-way at stream crossings, using mowing and herbicide applications to reduce the cover to herbaceous species. This modification to the natural vegetative cover may lead to erosion and sedimentation of streams. We are particularly concerned about this practice at stream crossings where Federally listed mussels may occur, specifically Bear Creek, the designated critical habitat for the Federally listed mussel, Cumberlandian combshell, *Epioblasma brevidens*. BF-D-N-10

**Comment:** At all stream crossings, especially where Federally listed mussels are known to occur, maintain or plant stream riparian areas with native shrub species and ensure that BMPs are installed to control erosion. BF-D-N-21

**Response:** *TVA includes protection of streamside management zones (SMZs) in their best management practices (BMP) for transmission line rights-of-way construction and maintenance. These BMPs include limiting the removal of vegetation canopy in SMZs, using extra caution with selection and application of herbicides and fertilizers, storing fuels and materials and maintaining vehicles outside of the SMZs, and regular inspections to control erosion. The staff believes that the applicant's program is sufficiently comprehensive to protect water quality of streams crossed by the transmission lines rights-of-way. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

#### **A.2.12 Comments Concerning Groundwater Use and Quality**

**Comment:** Page F-2, Table F-1, first item: The statement that BFN uses <100 gpm of groundwater is potentially misleading because BFN does not use any groundwater. BF-D-M-71

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**Response:** *Appendix F contains a listing of all GEIS Category 1 and 2 issues not applicable to Browns Ferry. This issue is appropriately listed in the table specifically because Browns Ferry does not use groundwater. The comment provides no new and significant information; however, the SEIS text was changed to state that no groundwater is used at BFN.*

### **A.2.13 Comments Concerning Surface Water Use and Quality**

**Comment:** Page 2-20, Line 6: Without any statement about the frequency of low flow at the plant, the assertion that the intake water flow encompasses a significant fraction of the daily average river flow can be somewhat misleading. Based on historical data, daily average river flows as low as the intake water flow occur less than 0.3 percent of the time, and daily average flows as low as three times the intake water flow occur only about 10 percent of the time. More specific values are stated in Section 4.1.1, Page 4-13, lines 28 B 30 (7Q10 of 8700 cfs in NPDES permit rationale). BF-D-M-8

**Comment:** Page 4-68, Lines 32-33: As noted in the comments for Section 2.2.2 Water Use, the statement about what is a "significant fraction" lacks a definition, and should be accompanied by a statement regarding the frequency of occurrence. BF-D-M-53

**Response:** *The text in this part of Section 2.2.2 and in Section 4.8.1 has been revised to include a reference to the 7Q10 value of 8700 cfs. The sentence has been revised to eliminate the imprecise phrase "significant fraction."*

**Comment:** Page 4-67, Bottom Paragraph beginning Line 30: This paragraph discusses the TVA Reservoir Operations Study (ROS). On Line 37 it is stated that "for all alternatives the existing minimum flow past the plant could be maintained." The cited reference is a TVA fact sheet entitled "Wheeler Reservoir Operations under the ROS Preferred Alternative." Although it is true that existing minimum flow past the plant could be maintained, this was not explicitly stated in the cited reference; rather, it states that "flow requirements also would be used to protect water quality and aquatic resources." Elsewhere in the ROS EIS (Chapter 3), data are provided showing that target minimum flows will be maintained. As noted in the comments for Section 2.2.2 Water Use, the target minimum flows for BFN were slightly changed by the ROS, and in some months are now slightly higher compared to the pre-ROS values. BF-D-M-52

**Comment:** Page 2-20, Lines 9 through 12: The stated minimum daily average flows (if sufficient water is available) were implemented via TVA's Reservoir System Operation and Planning Review of 1990, and these target values were in place at the time of NRC's March 2004 site visit to gather environmental information. The target minimum river flows for BFN are now slightly different as a result of the ROD for the Reservoir Operations Study (May 19, 2004). The target minimum daily average flows now are 10,000 cfs July through September (same as before); 11,000 cfs December through March (higher than before); and 7,000 cfs otherwise (higher than before). BF-D-M-9

**Response:** *The text in Section 2.2.2 has been revised to include the updated target minimum flow rates from the 2004 River Operations Study. The text in Section 4.8.1 has also been revised to include the updated information presented in the comment.*

**Comment:** Page 4-71, Line 32: All BFN potable water comes from Athens Water Services, which has the Elk River (not the Tennessee River) as its principal source. BF-D-M-54

**Response:** *The text in Section 4.8.5 has been revised to include the information provided in the comment.*

**Comment:** These and similar monitoring/sampling efforts by TVA are critical to ensuring that BFN's National Pollutant Discharge Elimination System (NPDES) permit limits, state water quality standards, and other environmental permit requirements are followed. Taken separately, the data suggests that there are relatively low or insignificant impacts occurring further downstream of the BFN site; however, a more detailed assessment is clearly necessary to evaluate conditions immediately downstream of the BFN site. BF-D-N-2

**Comment:** Monitor temperature, dissolved oxygen, alkalinity, pH, TRC, copper, and hydrazine at the downstream end of the mixing zone on a monthly basis to determine if modeling has accurately predicted concentrations. Target bottom waters at those times of the year that have historically produced the lowest river flow and warmest river water temperatures. BF-D-N-13

**Response:** *TVA has an ongoing program to monitor liquid effluents from the BFN site to demonstrate compliance with its NPDES permit, and the results of this monitoring are regularly reported. Parameters monitored, sampling locations, and sampling frequency are prescribed in the NPDES permit issued by the ADEM and are considered adequate to ensure water quality. The staff does not believe that additional monitoring is warranted, and if it were, it would be prescribed under the Federal Water Pollution Control Act through the NPDES permitting process. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** Conduct a formal risk assessment using EPA methods to assess whether concentrations are protective of sensitive fish and invertebrates, particularly federally listed mussels, if present. Include low-flow, high-temperature conditions in the risk assessment. BF-D-N-15

**Response:** *TVA performs all monitoring required to maintain compliance with the facility's NPDES permit, which is issued by ADEM. The NPDES permit includes limitations on various contaminants, and these limits are set at levels that are thought to be protective of aquatic organisms in the vicinity of the BFN site. The comment provided no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** In addition, the DGSEIS does not include complete information regarding the facility's CWA/NPDES compliance status:



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According to EPA's records, Browns Ferry Nuclear Plant has reported non-compliance regarding total suspended solids and coliform during the last two years. EPA's records also show that the facility was issued a letter of violation/warning by the State with regard to the Clean Water Act on February 17, 2004. However, page 2-8, line 22 mentions that "operations will continue to meet regulatory limits established in the existing NPDES Permit." Page 2-21 discusses the Plant's relationship with ADEM and the NPDES Permit, but does not mention the compliance status nor the letter of violation. The Final GSEIS needs to include information regarding how the facility has been addressing the non-compliance issues. BF-D-P-2

**Response:** *The applicant reported that there have been several incidents of NPDES non-compliance in the areas of total suspended solids and total coliform concentrations. These incidents appear to be related to the large number of workers onsite supporting the restart of Unit 1. TVA and ADEM have addressed these issues, and the NPDES levels were revised in October 2003. After an event in December 2003 (the source of the February 2004 Notice of Violation) TVA installed aerators in the sewage lagoons onsite to decrease the coliform counts. There have been no NPDES violations since these aerators were installed. Text was added in Section 2.2.3 that explains how TVA has been addressing the non-compliance issues.*

**Comment:** Nuclear power plants have a wide impact on water quantity and quality. Nuclear power plants release radioactive contaminants and hazardous chemicals into surrounding water resources, contribute greatly to thermal pollution, negatively impact aquatic life, and require enormous volumes of water in order to operate than any other traditional form of energy production and use significantly more water than renewable energy technologies. Browns Ferry itself uses a tremendous amount of water. The SEIS mentions that with Unit 1 back online, the total water withdrawal for all three reactors at Browns Ferry would be 3171 million gallons per day. That is staggering. We disagree with the assumption that only a small amount of water is lost due to evaporation. Though the reactors have limited use of cooling towers, water consumption does occur and should be quantified. Further, in order to reduce the negative impacts to water supplies, year-round use of cooling towers or the technology to install permanent-use cooling towers should be investigated and implemented. The NRC needs to further study this issue to help reduce Browns Ferry's negative impacts to surrounding water resources and provide a more thorough analysis of the benefits to water use and quality from renewable energy supplies than is currently addressed in the SEIS. BF-D-O-5

**Response:** *The staff acknowledges that BFN withdraws a large amount of water from Wheeler Reservoir. It is a maximum of 139 m<sup>3</sup>/sec (4907 cfs). Other than the water that is lost through evaporation during helper mode operation, all of the remaining water is returned to Wheeler Reservoir. Based on estimates provided in the GEIS (NRC 1996), the consumptive water use for a facility with 3900 MW(e) capacity would be between 2.0 and 3.4 m<sup>3</sup>/sec (72 and 120 cfs) depending on the proportion of water sent to the cooling towers. This represents on the order of 1 percent of the flow by the plant based on the 7Q10. In general, the more water directed through the cooling towers, the greater the consumption loss. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** Page 4-53, Lines 22 B 24: The cited reference (Hopping 2004) discussed discharge temperatures but not specifically thermal stratification. However, it can be concluded from the information given that thermal stratification will also increase. Actually, reservoir stratification locally will be disrupted by mixing from the diffusers. As the flow moves downstream, stratification will be reestablished as the heat accumulates at the surface. Due to the larger amount of heat, the stratification will be larger than that before EPU. Any excess heat will escape to the atmosphere, and the stratification will slowly approach natural conditions as the flow continues further downstream. Far-field modeling reported in the Environmental Report for the BFN License Renewal Application indicates that surface temperatures in the forebay of Wheeler Dam will be, on the average, about 0.3°F warmer for three units at EPU (compared with three units at the originally licensed thermal power). On average, the flow reaches Wheeler Dam before natural conditions are fully reestablished. BF-D-M-50

**Response:** *The text in Section 4.7 has been revised to acknowledge that the Hopping 2004 reference does not specifically address thermal stratification. However, the discharge temperatures will continue to be regulated through the NPDES permit process, and the staff's conclusion regarding the issues has not changed. The comment provided no new and significant information.*

**Comment:** Page 4-14, Lines 6 and 7: This section is focused on makeup water, but the volume of water "consumed" by BFN (82 cfs, as stated on Page 4-13, Line 34) is much too small to ever threaten other uses of the large volume of water in Wheeler Reservoir (as stated on Page 4-13, Lines 39-41). Consequently, TVA would never derate the plant to mitigate water use conflicts. The concluding sentence of this section should be changed to state, "The staff determined that water-use conflicts would be SMALL and further mitigation measures are not warranted." BF-D-M-35

**Response:** *The text in Section 4.1.1 has been revised. The applicant has proposed derating the plant for mitigation of thermal releases, but not for water-use conflicts.*

**Comment:** These average flows are targets determined by a computer model that has been given certain data sets or variables based on historic flow data. If these variables are inaccurate or erroneous, the model would produce an artificial reading of forecasted water quality conditions and aquatic organisms would bear the consequences. Our concern is for the welfare of the aquatic species located in, near, and downstream of BFN's effluent plume. We understand TVA has committed to complying with NPDES permit requirements at BFN. However, we find it difficult to understand how BFN can manage bringing Unit 1 back into service and up-rate the three units, when under current operations and during hot weather events, BFN has difficulty meeting NPDES water temperature limits on a consistent basis with Units 2 and 3. Although a sixth cooling tower would aid in reducing condenser circulating water temperatures, we fail to see how BFN could operate all three units at 120 percent power production capacity during these hot weather/high water temperature periods of the year without de-rating or without creating additional cooling systems to cool heated water. It is

unclear how these units could be up-rated if cooling capacity at BFN is insufficient. De-rating seems to be the only valid option in this case. Again, we have difficulty understanding the reasoning behind up-rating when, generally, the highest power consumption by the public occurs during the hottest weather periods of the year (i.e., as air conditioning use increases).  
BF-D-N-9

During hot weather, high-demand periods in July or August, TVA would be forced to request waivers from ADEM to exceed water quality standards and limitations for temperature designed to protect aquatic life. Such episodic violations are highly likely to occur in the future, especially during low-flow, drought years in the Tennessee River. As mentioned earlier, these critical periods of the year create difficult environmental conditions on the aquatic biota in the Tennessee River. Mussels may be especially vulnerable since the July to August period is when mussel metabolism increases and when dissolved oxygen availability decreases. Careful consideration of environmental impacts would need to be made by TVA as these events occur. We believe TVA should closely re-examine opportunities for thermal water storage and/or for storage of excess uptake water during high-temperature, low-flow conditions to prevent episodic lethal conditions for fish (including potential fish host of listed mussels) and invertebrates during such periods of high water use, even if water must be pumped from offsite locations. During such periods, there could be significant population-level effects on aquatic invertebrates and fish both near the discharge and downstream. BF-D-N-9

**Response:** *TVA plans to replace the sixth cooling tower, which, as stated in the comment, would partially mitigate for the increased thermal loading due to restart of Unit 1. The staff recognizes that during hot summer conditions, the applicant may request a waiver from ADEM. The staff is confident that ADEM will give appropriate consideration to the impact on aquatic organisms prior to issuing any waivers to the NPDES permit. Additionally, TVA has indicated that it would derate the plants when necessary to comply with the thermal limits imposed by the NPDES permit. The comment offers no new and significant information; therefore, no changes were made to the SEIS text.*

#### **A.2.14 Comments Concerning Land Use**

**Comment:** Page 2-65, Paragraph beginning Line 27: The acreage for Mallard-Fox Creek State Wildlife Management Area (WMA) is 1483 (all land acres). The acreage for Swan Creek State WMA is 8870 (3045 acres land; 5825 acres water). Both WMAs are managed by the Alabama Department of Conservation and Natural Resources, Division of Wildlife & Freshwater Fisheries, and both WMAs are used for waterfowl and small game hunting. (Info corrected from BFN License Renewal Environmental Report.) BF-D-M-28

**Response:** *The text of the SEIS was modified to reflect the information provided in the comment.*

### A.2.15 Comments Concerning Cultural Resources

**Comment:** Page 4-40, Sentence beginning in Line 10: License Renewal by itself changes nothing with regard to historic properties. BF-D-M-44

**Response:** *The text in Section 4.4.5 has been changed to indicate that continued operation during the license renewal term could affect cultural resources.*

### A.2.16 Comments Concerning Socioeconomics

**Comment:** Page 8-5, Line 22: The total TVA payment to Limestone County was \$4,544,825 in FY 2002 and \$4,566,727 in FY 2003. Not all of this, however, is attributable to BFN. The BFN portion of this payment was \$2,008,723 in FY 2002 and \$2,015,210 in FY 2003. Total county revenues are variable, causing the share to vary considerably from year to year. However, in FY 2002, the BFN portion of TVA's payment was 6.5 percent of the total county revenues of \$30,758,933; in FY 2003, they were 10.03 percent of county revenues of \$20,082,621. The 5.88 percent value quoted at the bottom of page E-209 of the Environmental Report is not correct. BF-D-M-56

**Comment:** Page 8-5, Paragraph beginning Line 36: Per the above comment, the property tax revenue equivalent from BFN is approximately 10 percent or less of total Limestone County revenues. BF-D-M-57

**Response:** *The text in Section 8.1.7 was changed to include the information provided in these comments.*

**Comment:** Page 2-66, Line 29: The referenced statement from TVA's SEIS for BFN License Renewal (TVA 2002a) states that "There are no Federal, State of Alabama, or local municipal noise standards, regulations or ordinances that apply to the action alternatives evaluated in this SEIS." Suggest re-wording the sentence beginning Line 29 to "Currently, there are no Federal, State, or local municipal noise standards or regulations that apply to BFN license renewal alternatives" or the equivalent. BF-D-M-29

**Response:** *The text in Section 2.2.8.4 was changed as suggested in the comment.*

**Comment:** Page 2-66, paragraph beginning Line 29: The sound level values used in this paragraph do not include the planned sixth cooling tower. A suggested improvement is to use the 6-tower calculated results from Section 4.3.19 of TVA's FSEIS for BFN License Renewal as bounding values. BF-D-M-30

**Response:** *The sound levels discussed in this paragraph are based on real measurements of ambient sound levels, which the staff believes is preferable to modeled results. In the previous paragraph, it was pointed out that the addition of a sixth cooling tower is expected to increase*

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*ambient sound levels by 1 to 2 decibels, which is comparable to the noise modeling results in the comment. The comment is noted, and no change in the text is required.*

**Comment:** Page 2-61, beginning Line 33: The sentence beginning on this line should be clarified to state that the "approximately 1200 persons" is for the BFN non-outage operating staff, and does not include the Unit 1 recovery workers. For example, the sentence could be changed to read, "BFN, which is the primary traffic generator in the vicinity of the site, currently averages a daily site non-outage population of approximately 3600 persons; of this total, 1300 is for the total Unit 2/3 operating workforce, and 2300 is for Unit 1 recovery." The sentence beginning in Line 35 could also be changed to read, "The operating unit population currently peaks at approximately 2200 during outages, which occur every 24 months (per unit) for approximately 2 months." BF-D-M-26

**Response:** *The text in Section 2.2.8.2 "Transportation" was changed based on the data provided in the comment.*

**Comment:** Page 2-68, Line 1: The 2 percent growth per year value referenced from the BFN License Renewal Environmental Report (TVA 2003a) cannot be confirmed. The correct annual growth rate is 1.5 percent, not 2. BF-D-M-34

**Response:** *The value expressed for employment growth in Limestone County had been rounded to the nearest whole percentage. The text of Section 2.2.8.5 has been modified to state the actual 1.5 percent expected growth rate.*

**Comment:** Page 2-67, Line 5: Delete the reference to 10-mile ring increments; TVA estimated the population only for 20- and 50-mile rings. BF-D-M-31

**Response:** *The text was changed in Section 2.2.8.5 as suggested in the comment.*

**Comment:** Page 4-37, Sentence beginning Line 10: This sentence appears to contradict itself regarding the existence or absence of refurbishment activities. Also, the permanent plant staffing will increase for Unit 1 operations. BF-D-M-40

**Response:** *The text in Section 4.4.2 was corrected to remove the contradiction, BFN plans no refurbishment activities.*

**Comment:** Page 4-39, Line 21: The license renewal staff is in Chattanooga and is temporary; currently only one license renewal person is at the site. BF-D-M-42

**Response:** *The draft SEIS text was referring to new staff added to support plant operations during the license renewal term, based on an assumption in the GEIS for a bounding scenario. The text in Section 4.4.4 has been changed to clarify the basis for these bounding scenarios, and the expected impact on local roadways.*

**Comment:** Page 4-39, Line 25: The number 1810 assumes 210 more vehicles on each road. If the traffic divides equally as stated, there would be 70 more vehicles on each road.

BF-D-M-43

**Response:** *The total vehicles per day numbers in Section 4.4.4 have been corrected based on the bounding scenario regarding the number of expected future permanent workers at BFN.*

**Comment:** People are losing their jobs and there are people considering – no people, whole areas that are considering not even using TVA power now. BF-D-H-3

**Response:** *The comment is noted. The comment is not specific and is outside the scope of license renewal. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** Page 2-67, sentence beginning Line 13: In contrast to this statement, the ER on Page E-34 states that the AL growth rate is projected to exceed that of Lauderdale and Morgan Counties from 2000 to 2015. BF-D-M-32

**Response:** *The text in Section 2.2.8.5 has been changed to indicate that the population growth in all four counties (Lauderdale, Limestone, Madison, and Morgan) is expected to increase by greater than 10 percent between 2000 and 2015.*

**Comment:** Page 2-67, Line 37: The 24.5 percent value for Limestone County population growth between 1990 and 2001 is not recognized. It might have been based on an earlier population estimate. The correct change is 23.6 percent based on the most recently released (2004) U.S. Census Bureau county population estimates. BF-D-M-33

**Response:** *The text in Section 2.2.8.5 has been changed as recommended in the comment.*

**Comment:** Page 4-37; Sentence beginning Line 14: The assumed numbers are not understood. Permanent plant staffing will increase by approximately 150 for Unit 1 operations. BF-D-M-41

**Response:** *The basis for the analysis presented in Section 4.4.2 has been changed from 100 new jobs to 150 based on the information presented in the comment.*

#### **A.2.17 Comments Concerning Human Health and Radiological Impact**

**Comment:** If I get some of that nuclear radiation in me, I cannot get it out. It will affect me and my children and all the way down the line. BF-D-F-7

**Response:** *The NRC sets limits on radiological effluents, requires monitoring of effluents and foodstuffs to ensure those limits are met, and has set dose limits to regulate the release of*

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*radioactive material from nuclear power facilities. The regulations are intentionally conservative and provide adequate protection for the public including the most radiosensitive members of the population. TVA monitors its effluent and calculates an offsite annual dose caused by radioactive liquid and gaseous effluents. These calculations are performed to demonstrate the licensee's compliance with NRC regulations. As discussed in Section 2.2.7 of this SEIS, the actual annual doses to the public from operation of BFN are a very small percentage of these limits.*

*TVA submits two annual reports for Browns Ferry to the NRC regarding environmental monitoring and environmental effluents. The Annual Radiological Environmental Operating Report (AREOR) and the Annual Radiological Effluent Release (ARER) Report are available to the public through the NRC's Public Document Room in Rockville, Maryland or from the NRC's Electronic Reading Room available online at <http://www.nrc.gov/reading-rm.html>. The NRC staff finds that the health risk to a member of the public from radioactive releases from a nuclear power plant to be very small. The comments provide no new and significant information; therefore, no changes were made to the SEIS text.*

**Comment:** This torus started out – and I do believe it was financial gain, and they threw safety out the window to get there. We had a man to get internally contaminated in there by these people, by instructing him to do the things the wrong way. I stopped two other gentlemen from doing the job. They stuck him in. He done it the way they wanted; he got internally contaminated. He has yet to get a report from NRC as to why these people didn't get disciplined for sending him in there like that. Why? I mean did the report not be sent to NRC, or is it just not been finished yet to get back with him. It was over eight or nine – well, close to a year now that he was internally contaminated under instructions by people that are still in that plant doing things in this manner. BF-D-C-10

**Comment:** Now what really was totally immoral and absurd that this nuclear industry from the uranium mining all the way to the making of plutonium avoids any responsibility when workers in the mines, Native Americans, on down the line, pipefitters, get cancer. They always claim that it had nothing to do with the exposure of those workers, and somehow have gotten by with this. There was a lawyer from Tennessee that represented indigenous Native Americans back in, I guess, the 70s who had their skin falling off, who had worked in the uranium mines. The industry denied any wrongdoing or any responsibility to help these people. BF-D-G-10

**Comment:** He inhaled radioactive particles or particulates and I cannot envision exactly how it happened, but I believe it was radioactive water or steam escaped into the air and he happened to be there at the wrong time, and he inhaled it...And if this industry is going to take the responsibility of what may befall him. He's just one out of a thousand workers who have not been in the reports because it isn't very good for the industry to admit that these things have happened, and no responsibility has been taken by the industry. BF-D-G-9

**Response:** Impacts to uranium miners is outside the scope of this SEIS. Impacts associated with occupational exposure are addressed in Section 4.3. Without more information on the inhalation incident described by the commenter the staff is unable to respond specifically to the alleged contamination event. The Staff can provide some general comment on occupational exposure. Although radiation may cause cancers at high doses and high dose rates, currently there are no data that unequivocally establish the occurrence of cancer following exposure to low doses and dose rates, below about 0.1 Sv (10 rem). However, radiation protection experts conservatively assume that any amount of radiation may pose some risk of causing cancer or a severe hereditary effect and that the risk is higher for higher radiation exposures. Therefore, a linear, no-threshold dose response relationship is used to describe the relationship between radiation dose and detriments such as cancer induction. Simply stated, any increase in dose, no matter how small, results in an incremental increase in health risk. This theory is accepted by the NRC as a conservative model for estimating health risks from radiation exposure, recognizing that the model probably over-estimates those risks. Based on this theory, the NRC conservatively established a limit of 0.05 Sv/yr (5 rem/yr) in 10 CFR Part 20 for radiation doses to people exposed to radiation as part of their job, such as operating personnel at nuclear power plants.

Nuclear power plant radiation protection and dose monitoring programs are regularly inspected by NRC health physics experts. In addition, the doses received by workers are required to be reported to the NRC and to the individual worker, and any dose exceeding the limits of 10 CFR Part 20 would have been investigated by NRC.

Many studies have been performed on the biological effects of radiation. None of the scientifically valid studies show any radiation effects at acute doses less than 0.1 Sv (10 rem), and the average dose to a nuclear power plant worker is much less than 0.01 Sv/yr (1 rem/yr). The NRC finds that the health risk from occupational radiation exposure to nuclear power plant workers is very small. The comment provides no new and significant information; therefore, no change was made to the SEIS text.

**Comment:** Page 2-57, paragraph at top of page: For aquatic monitoring TVA does not currently sample invertebrates, and terrestrial monitoring includes food crops, soil, and milk if applicable. BF-D-M-25

**Response:** The text in Section 2.2.7 was modified based on the information in this comment.

#### A.2.18 Comments Concerning Postulated Accidents

**Comment:** I have a comment about the groundwater. If NEPA does not require the worse case scenario to be examined or outlined, it seems like it would be a very nice courtesy of NRC and TVA to provide us with information as to what would happen. Say, like, back in 1975 when a candle started a fire. What would have happened or what could have happened if we did



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have a meltdown to the groundwater? It would be a courtesy. It is not legally required but...  
BF-D-G-1

**Comment:** And the possibility of accidents, even though they might be very remote, would be so catastrophic that we're going with this. BF-D-H-7

**Response:** *An accident resulting in contamination of the groundwater, although highly unlikely, could happen. However, groundwater contamination is generally slow moving, and most radioactive contaminants quickly combine ionically with clay particles in the soil. Furthermore, technology exists to clean up groundwater contamination. The effects of accidents are considered in both the environmental and safety reviews for license renewal. Postulated accidents, including design-basis and severe accidents, are addressed in Chapter 5 of this SEIS. The comments provide no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** As someone alluded to earlier about the Chernobyl factor and the Three Mile Island, we have not successfully cleaned up those areas. Those areas have been lost to our grandchildren and generations past them. It is something for us to consider. BF-D-F-4

**Comment:** Eighty-two percent of the kids born in Chernobyl over where Chernobyl is at in Russia, is born with birth defects. Eighty-two percent. And some of it could have been prevented. Maybe some of this can be prevented up here. This is definitely a safety issue that needs to be addressed. BF-D-C-4

**Response:** *The design of nuclear power facilities, such as BFN, in the United States, is very different from the Chernobyl facility design. Partial cleanup of the Three Mile Island (TMI) Unit 2 site has been accomplished. The unit is in long term storage and final cleanup of the facility is deferred until TMI Unit 1 permanently ceases operation, at which time both units will be decommissioned simultaneously. Also, since the TMI accident, there have been significant improvements in the safety of nuclear power plants in the United States, and BFN meets the Commission's current safety goals. As discussed in Section 5.0 of the SEIS, the likelihood of a severe accident at BFN is very small. This comment provides no new and significant information; therefore, no change was made to the SEIS text.*

### A.2.19 Comments Concerning the Uranium Fuel Cycle and Waste Management

**Comment:** In all likelihood, license renewal at Browns Ferry reactors would exacerbate existing space issues regarding onsite spent fuel, and create 20 years' worth of additional, dangerous high-level waste, with no practicable or thorough means of securing it. The draft SEIS fails to evaluate the environmental impacts and security threat of indefinitely storing the additional irradiated fuel that will be generated over the 20-year license extension. Each reactor will create annually between 100 and 150 metric tons of additional irradiated fuel to the site. Despite the NRC's Waste Confidence Decision, the only site under consideration, Yucca

Mountain in Nevada, is far from a done deal. Numerous scientific questions remain about whether the site can safely store waste. Moreover, the Department of Energy (DOE) has not yet submitted its license application to the NRC, although the statutory deadline was more than two years ago. DOE was supposed to begin accepting waste in 1998 and is highly unlikely to meet its revised goal of accepting waste by 2012. Even if Yucca Mountain is opened, the site cannot hold the high-level radioactive waste that will be generated by existing reactors after 2010. Therefore, in addition to the waste generated by existing reactors, waste created by the reactors over the 20-year extension would also have to remain onsite for an indefinite period of time. The environmental impacts of indefinite storage must be thoroughly evaluated in the final SEIS. BF-D-0-8

**Comment:** It goes against common sense to plunge forward with this technology when we've had years to find this permanent repository or depository for the spent fuel. Science is wonderful, but it doesn't compare with common sense then it's not very useful. If you have a toilet that's clogged up, you don't keep using the toilet. BF-D-G-7

**Comment:** It was wrong then and it is wrong now. You all can do your job the very best you can, but that waste is still going to be there. And we don't have faith in the human race, if this is the only way to go. We are too short sighted. Everybody maybe thinks that the world is going to end tomorrow, but we don't know. We're supposed to be stewards. We don't know this. BF-D-H-10

**Comment:** The major problem with nuclear power has to do with storage of the waste. I don't think anybody has really figured in how much this is going to cost. I don't think they can. That's what makes nuclear power totally unfeasible. BF-D-H-6

**Comment:** One of the things mentioned in the study has to do with the economic impact. Well, the half life of plutonium is – what is it(?) 240,000 years? That's going to have to be guarded for that long. How can we rationalize this to our children, to the future? We don't even have a place to put it right now. BF-D-H-1

**Comment:** Based on the review of the DGSEIS, the document received a rating of EC-1, meaning that environmental concerns exist regarding some aspects of the proposed project. Specifically, protecting the environment involves the continuing need for appropriate storage and ultimate disposition of radioactive wastes generated onsite... The DGSEIS acknowledges that OL renewal of the Browns Ferry Nuclear Plant will require continuing radiological monitoring of all plant effluents. Appropriate storage of spent fuel assemblies and radioactive wastes onsite is required, in order to prevent impacts. Page A-11 discusses the Waste Confidence Rule (10 CFR 51.23), in which the Commission generically determined that the spent fuel generated by any reactor can be safely stored onsite for at least 30 years beyond the licensed operating life of the reactor. Ultimately, long-term radioactive waste disposition will require transportation of wastes to a permitted repository site. We note the information on

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pages 6-4 through 6-6 of the document, regarding the expected availability of Yucca Mountain as a geological repository for spent nuclear fuel and high-level waste. BF-D-P-1

**Response:** *The Waste Confidence Rule, found in 10 CFR Part 51.23, states that "the Commission has made a generic determination that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor at its spent fuel storage basin or at either onside or offsite independent spent fuel storage installations. Further, the Commission believes there is reasonable assurance that at least one mined geologic repository will be available within the first quarter of the twenty-first century, and sufficient repository capacity will be available within 30 years beyond the licensed life for operation of any reactor to dispose of the commercial high-level waste and spent fuel originating in such reactor and generated up to that time." Onsite spent fuel storage facilities, and the associated storage casks, are licensed by the NRC and must meet standards set forth in 10 CFR Part 72. The comments provide no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** I think more people would be here tonight if these kinds of issues were in the newspaper, if the politicians didn't stifle this information, which I know does happen. If you start talking about transporting this highly radioactive material across the country to Utah or out west to the Rocky Mountains, there are going to be people in those states that are going to not be happy. That's already been proven to be true. And they're going to see people very worried about the security of that transported waste. BF-D-G-8

**Response:** *Transportation of radioactive material across the country presently occurs on a daily basis. The regulations applying to transportation of radioactive materials are provided by the U.S. Department of Transportation and are found in 49 CFR Parts 171-177 and NRC regulations are found in 10 CFR Part 71. These regulations have been and will continue to be adequate to protect public health and safety and take into account public presence in the vicinity of waste shipments and the possibility of malevolent acts. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** Also, the issue of radioactive waste from this plant, I would like to have a history of where this waste has gone, what kind of waste has gone where, where is it going now, how much of it is still stored on the site. A lot of people don't understand that we have a nuclear waste ground right here in our back yard. And somebody are naive and oblivious to the realities of this technology. BF-D-G-4

**Response:** *Section 2.1.4.3 of this SEIS states that, "During the period from 1999 to 2002, generation rates for radioactive solid wastes from routine operation and maintenance activities at Units 2 and 3 ranged from 514 to 654 m<sup>3</sup> (18,200 to 23,100 ft<sup>3</sup>) per year." The total amount of low-level radioactive solid waste generated in 2003 and 2004 was 594 m<sup>3</sup> (21,300 ft<sup>3</sup>) and 460 m<sup>3</sup> (16,200 ft<sup>3</sup>) respectively. During the period from 1999 to 2002, Units 2 and 3 made 133*

shipments of solid radioactive waste with a total activity of  $3.0 \times 10^{13}$  Bq (820 Ci). Dry active waste was sent to Envirocare in Utah; spent resins were sent to Barnwell, South Carolina."

Based on a two-year refueling cycle at the proposed EPU power level, each unit will produce spent fuel waste that, if it could be formed into a cube, would have a total volume of approximately  $4.3 \text{ m}^3$  ( $152 \text{ ft}^3$ ) per year, or approximately 1.6 m (5.2 ft) on a side. The spent fuel does require more volume for storage than this estimate because the fuel is contained in long fuel rods, and is currently stored in the spent fuel pools on site. TVA is currently constructing an Independent Spent Fuel Storage Installation (ISFSI) at BFN for dry storage of spent fuel until a permanent repository is available. The comment provides no new and significant information; therefore, no change was made to the SEIS text.

**Comment:** Page 2-62, Line 20: Since DOE (eventually) takes responsibility for spent fuel at the nuclear plant site boundary, TVA will not be involved in spent fuel shipments past that point. As a suggestion, the words "TVA plans to" could be changed to "DOE may." BF-D-M-27

**Response:** The text in Section 2.2.8.2 was changed to indicate that the rail spur might be used for dry cask removal, without assigning those plans to TVA.

#### A.2.20 Comments Concerning Alternatives

**Comment:** Aren't most people getting away from nuclear power? Renewable energy sources. If we had just put the money that we poured in to nuclear power toward renewable energy sources and conservation. We don't do squat with conservation. We could save billions and billions of dollars just with conservation. BF-D-H-5

**Comment:** There are alternatives. There are answers to clean air other than nuclear power. We have incentives for solar power and conservation. There's nothing out there now. Jimmy Carter had great programs going for getting people into renewable energy sources. We're not doing any of that now. We can come up with solutions that are safe that the generations ahead of us are not going to have to take care of and guard and be afraid of. This is what is just wrong. It is morally wrong what we're doing. BF-D-H-8

**Comment:** Are we moving over to a more efficient form of energy? BF-D-D-3

**Comment:** The problems associated with short- and long-term handling of storage of nuclear waste far outweigh the short-sighted continuation of this astronomically expensive and dangerous technology, when we should be committing money to renewable and sustainable alternative energy sources, such as photovoltaics and wind power. Which, when paired with conservation, is a much more logical solution to our energy needs. BF-D-G-12

**Response:** The SEIS for BFN presents the staff's analysis of the environmental impacts of the proposed action (i.e., renewal of the operating licenses for Browns Ferry) and of reasonable

*alternatives. These impacts are presented in discrete resource areas so that environmental impacts can be compared between the proposed action and reasonable alternatives. The SEIS is not an evaluation of the best combination of energy generation sources for the Alabama area, or a determination regarding which combination would result in the least overall environmental impacts. The decisions regarding which generation sources to deploy are made by the applicant and State agencies, not the NRC. The viability of the various alternatives to renewal of the operating licenses for BFN is pertinent to the discussion of alternatives to the extent that an alternative is considered reasonable. However, the staff recognizes that although some alternative energy sources, when considered by themselves, may not be viable replacements for BFN, these alternatives could be part of a combination of generation sources that could replace BFN. The many possible combinations could include combined-cycle, gas-fired plants, clean-coal plants, renewable energy sources such as wind and solar power, and energy conservation. One possible combination is discussed in Section 8.2.7. The comments provide no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** Page xx, Line 15: The statement is made that power generation alternatives are evaluated assuming that the replacement power generation plant is located at either the BFN site or some other unspecified alternative location. In contrast, Chapter 8 follows material supplied in TVA's Environmental Report, which analyzes four different types of alternative power plants, all of which are analyzed at specified locations and none of which (for stated reasons) are at the BFN site. BF-D-M-1

**Response:** *The statement in the Executive Summary has been modified to be consistent with the analysis in Chapter 8.*

**Comment:** The SEIS does not provide a thorough review of energy alternatives or technologies. Some data appears out of date and should be revisited using the most current information from independent sources, not just directly from TVA. Further, it is hard to understand how renewable energy technologies, like biomass, solar, and wind, which are not likely to be targeted by terrorists nor have the capacity in terms of accidents to kill thousands of people or permanently contaminate large land areas, can be assessed by the NRC to have a large environmental impact while relicensing all the reactors at Browns Ferry is considered to have a small impact. This assessment flies in the face of common sense. BF-D-O-7

**Response:** *Alternative energy production technologies are evaluated in Chapter 8. None of the technologies listed in the comment were determined to be viable alternatives for replacement of all of the power generated by BFN, and therefore, the potential environmental impacts of these technologies were not fully evaluated. Furthermore, malevolent acts, such as terrorism, are beyond the scope of NEPA. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** According to a recent study by the Renewable Energy Policy Project, called Powering the South: A clean and affordable energy plan for the Southern United States,

Alabama has the ability to significantly reduce electricity consumption through existing, affordable energy efficiency measures. If these measures were adopted, by 2020 Alabama could: save 29 MWh of electricity; reduce electricity demand by 23 percent; and reduce net electricity costs by \$651 million. Reducing energy demand and use saves not only money but also precious water resources. Further, less nuclear waste would be generated. More recent energy efficiency and conservation measures should be studied and implemented before permitting the relicensing of Browns Ferry's three reactors or the restart of Unit 1. TVA has excellent wind resources within its service area. In fact, they have approximately 29 MW of wind currently installed. TVA should be encouraged to invest more in developing this clean, safe energy resource instead of spending billions of dollars on the costs of restarting Unit 1 and extended operation of all three nuclear reactors. There is also potential for biomass energy production in Alabama and TVA's service territory. Clean forms of biomass represent a homegrown energy source that can provide local jobs to rural areas that would also support farmers and the region's economy, while helping expand renewable energy technologies. The use of solar technologies, such as photovoltaics and solar thermal systems, are not as cumbersome or difficult as reflected in the SEIS. The Rancho Seco nuclear plant, which is now closed, provides an example of the land availability at existing nuclear plants. There was minimal information in the SEIS on these options. BF-D-0-9

**Response:** *The alternative energy production technologies discussed in this comment are evaluated in Chapter 8 of the SEIS. Although these technologies are worthy of consideration, and are valuable parts of the overall electrical power production system in the United States, none was determined to be a viable replacement for the power generated by three BFN reactors. The 29 MW of wind-turbine power referenced in the comment represents less than 1 percent of the BFN electrical power production. Replacing all of the BFN electrical power with wind generation would require many thousands of acres for turbine placement and transmission lines. The other technologies mentioned also would result in significant land disturbance, or other adverse effects if developed to fully replace the power generated by BFN. The comment provided no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** Page 8-6, bottom paragraph: These potential negative and disproportionate impacts could apply to secondary job losses (such as retail, services, etc.) but not to direct BFN job losses. BF-D-M-58

**Response:** *The text in Section 8.1.10 has been changed to reflect this comment.*

**Comment:** Page 8-40, Table 8-8, Impact Category of Land Use: The "Impact" is listed as MEDIUM to LARGE and the "Comment" statement is made that "additional land-use impacts would occur for uranium mining." Currently, BFN has fuel contracts to use blended-down surplus highly enriched uranium; these do not involve any uranium mining, and it is likely that an ABWR at Bellefonte could use the same fuel, especially if BFN was discontinued. BF-D-M-64

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**Response:** *The statement in Table 8-8 under Land Use has been changed from "would occur" to "might occur." The same change to the text was made under Land Use in Section 8.2.4.*

**Comment:** The paragraph on Delayed Retirement is not consistent with the following statements made by TVA in a May 27, 2004 letter to NRC transmitting additional Information for "License Renewal Environmental Review" from Mark Burzynski, Manager of Nuclear Licensing: "TVA has no schedule for retiring current generating units. TVA is adding environmental controls and maintaining the existing units as necessary to keep them running. TVA has no retired fossil units that would be considered for restarting." Please delete all references to TVA fossil plants being slated for retirement. BF-D-M-65

**Response:** *The SEIS text in Section 8.2.6.10 has been modified to reflect the statement made in the May 27, 2004, letter.*

**Comment:** Page 8-2, Paragraph beginning Line 7: Suggest re-ordering these options, from the most likely to the least likely, which would be (3), (2), (1), or (4). Spelled out, this would be as follows: Under the no-action alternative, replacement of BFN electricity generation capacity would be met by (1) TVA generating alternatives other than BFN, (2) power purchased from other electricity providers, (3) demand-side management (DSM), or (4) some combination of these options. BF-D-M-55

**Response:** *The text in Section 8.1 has been modified to reflect this comment.*

**Comment:** Page 8-54, Table 8-10, Impact Category on Air Quality: The air emissions values listed are approximately 80 percent of the values listed in Table 8-6, which were the values stated by TVA for seven 510 MW units. BF-D-M-67

**Response:** *The values in Table 8-10 have been corrected, and they are based on six natural gas, combined-cycle power plants.*

### A.2.21 Editorial Comments

**Comment:** Page 2-4, Line 26: The sentence beginning on this line would be clarified if it was changed to read, "Each unit was originally licensed for an output." BF-D-M-4

**Comment:** Page 2-7, Line 7: Please check the number 8.75; this should possibly be 8.66. BF-D-M-5

**Comment:** Page 4-26, Sentence beginning Line 15: Change "will be required if the proposed action" to "will be required whether or not the proposed action." BF-D-M-37

**Comment:** Page 4-66, Line 12: The word "municipal" on this line appears to be an error; the intended word may be "industrial." BF-D-M-51

**Comment:** Page 2-46, Table 2-3, Line 10: The table caption would be more accurate as "Federally Listed Terrestrial Species Reported from Counties Associated with the Browns Ferry Nuclear Plant Site and its Transmission Line Corridors." BF-D-M-14

**Comment:** Page 2-53, Table 2-5, Line 1: The specific epithet for white walnut is *cinerea*. BF-D-M-19

**Comment:** Page 2-49, Table 2-4, Line 29: The specific epithet for dwarf filmy fern is *petersii*. BF-D-M-16

**Comment:** Page 2-50, Table 2-4, Line 3: The specific epithet for prairie trillium is *recurvatum*. BF-D-M-17

**Comment:** Page 2-50, Table 2-5, Line 10: The table caption would be accurate as "Mississippi State-Listed Terrestrial Species Reported from the Vicinity of the Browns Ferry Nuclear Plant and Associated Transmission Line Corridors." BD-D-M-18

**Comment:** Page 2-47, Table 2-4, Line 5: The table caption would be more accurate as "Alabama State-Listed Terrestrial Species Reported from the Vicinity of the Browns Ferry Nuclear Plant and Associated Transmission Line Corridors." BF-D-M-15

**Response:** *The text of the SEIS has been modified.*

**Comment:** Page E-25, Line 36: As noted earlier, the use of the word "committed" could invite confusion with regulatory commitments. A more accurate characterization would be as follows: "As reflected in the Record of Decision for the TVA Final Environmental Impact Statement for BFN License Renewal (Federal Register Vol. 67, No. 117, pp. 41565-41569, June 18, 2002), TVA's decision was to adopt the agency-preferred alternative to refurbish and restart BFN Unit 1, to proceed with NRC license extensions for all three units at BFN, and to construct a single 20-cell linear mechanical draft cooling tower in the currently vacant position (tower 4) where a tower that was destroyed by an accidental fire in 1986 was never replaced. Regardless of the schedule for power uprates on any unit, the 6th tower is scheduled for completion prior to the first summer following Unit 1 restart." BF-D-M-72

**Comment:** Page 2-19, Line 22: The statement is made that "TVA has committed to rebuild the sixth cooling tower." To avoid any potential confusion with regulatory commitments, please replace the referenced statement with the following sentence: "As reflected in the Record of Decision for the TVA Final Environmental Impact Statement (Federal Register Vol. 67, No. 117, pp. 41565-41569, June 18, 2002), TVA's decision was to adopt the agency-preferred alternative to refurbish and restart BFN Unit 1, to proceed with NRC license extensions for all three units at BFN, and to construct a single 20-cell linear mechanical draft cooling tower in the currently vacant position (tower 4) where a tower that was destroyed by an accidental fire in 1986 was never replaced. With EPU of Units 2 and 3 at 120 percent of the originally licensed power level



## Appendix A

and the rebuilding of this tower, the consumptive use of cooling water would therefore increase.” BF-D-M-7

**Response:** *Section 2.2.2 has been modified to state that the restart of Unit 1 will require construction of a sixth tower. This is consistent with the licensee’s 2004 Unit 1 Extended Power Uprate Environmental Report. The text in Appendix E was not changed because the BA had already been submitted to the FWS.*

**Comment:** Page 1-6, Line 6: The phrase “and its support organization” is not understood. To whom or what entity does this refer? BF-D-M-3

**Response:** *The comment is noted, and the text in Section 1.2.2 has been changed.*

**Comment:** Page 2-7, Line 18: The number 7800 is correct but TVA 2003a may not be the correct reference (source). BF-D-M-6

**Response:** *The comment is noted, and the text in Section 2.1.3 has been changed to include the appropriate reference.*

**Comment:** Page 2-44, Line 14: The *Cornus* spp. parenthetical should be changed to *Cornus florida*. BF-D-M-11

**Response:** *The text in Section 2.2.6 has been changed based on the information provided in this comment.*

**Comment:** Page 2-45, Line 5: The scientific name for black willow (*Salix nigra*) is not provided. BF-D-M-13

**Response:** *The scientific name for black willow was provided on page 2-44, line 25 of the DSEIS. The scientific name is provided only once in a section immediately after the first usage of the common name of the species. This comment resulted in no change in the text.*

**Comment:** Page 4-49, Line 16: To be more accurate, this sentence should be corrected as follows: “candidate species) that occur or historically have occurred in either Wheeler Reservoir.” BF-D-M-45

**Response:** *The comment is noted, and the text in Section 4.6.1 has been changed.*

**Comment:** Page 4-49, Line 30: To use correct terminology, replace the phrase “Each sensitive area review project” with “Each proposed transmission line vegetation management project.” BF-D-M-46

**Response:** *The comment is noted, and the text in Section 4.6.1 has been changed.*

**Comment:** Page 4-53, Line 9: As written, this sentence may be misleading. With the new condensers and other changes the total intake flow when Unit 1 is restarted will be higher than for previous three-unit operation. BF-D-M-49

**Response:** *The text in Section 4.7 has been changed to include the fact that the flow with the new condenser tubes is greater than the original three-unit flow, but the extended power uprate (EPU) will not result in an increased flow rate.*

**Comment:** Page 8-17, Line 31: TVA projects that the total number of workers would exceed 500 for approximately 2 1/2 years (see TVA's Environmental Report for BFN License Renewal, Page E-289, paragraph under Socioeconomics). BF-D-M-60

**Response:** *The text in Section 8.2.1.1 of the SEIS has been modified.*

**Comment:** Page 8-36, Sentence beginning on Line 2: This sentence appears to contradict itself; it may have too many negatives. BF-D-M-62

**Response:** *The text in Section 8.2.3.1 of the SEIS has been modified.*

**Comment:** Page 8-36, Sentence beginning on Line 32: This sentence is not clear; words may have been omitted, or it might contain grammatical errors. BF-D-M-63

**Response:** *The text in Section 8.2.1.1 of the SEIS has been modified.*

**Comment:** Page 8-53, Line 29: Suggest spelling out DSM (Demand-Side Management). BF-D-M-66

**Response:** *Demand-side management was defined on page 8-2; no change in the text was required.*

**Comment:** Page 8-32, Table 8-6, Impact Category for Air Quality: The stated quantities of air emissions are the values reported in Section E.7.2.2.1 of TVA's Environmental Report for BFN License Renewal, but they are based on seven NGCC plants. In Section 8.2.3 on Page 8-31 of NRC's SEIS, the statement is made that eight NGCC plants would be needed. BF-D-M-61

**Response:** *Section 8.2.3 has been revised. The analysis is based on seven replacement natural gas, combined-cycle power plants rather than eight.*

**A.2.22 Comments Concerning Issues Outside the Scope of the Environmental Review for License Renewal: Aging Management, Blended Low Enriched Uranium Fuel, Cost of Power, Operational Safety, Restart of Browns Ferry Unit 1, and Safeguards and Security**

**Aging Management**

**Comment:** If there is any possibility of premature aging of any of the containment vessels as discussed above, TVA should be required to determine by scientific measurement the structural soundness of each reactor containment vessel using non-invasive techniques or whatever method is available. If these techniques do not exist, TVA should be required (before license approval) to develop the techniques and undertake the testing and analysis to determine and be able to assure the local public and the NRC that there is no danger of containment vessel failure. BF-D-E-9 and BF-D-K-9

**Response:** *Various structures and components are inspected as part of the license renewal process. These include passive structures and components that perform an intended function without moving parts or without a change in configuration, change in properties, or change of state. These may include structures and components that are classified as inherently reliable under the Maintenance Rule (56 FR 31324, July 10, 1991 as amended), or structures and components for which aging degradation is not readily monitored. In addition, inspections of long-lived structures and components that are not subject to replacement based on a qualified life or specified time period are required for license renewal. For further information on the requirements for license renewal inspections, please refer to Inspection Procedure 71002, "License Renewal Inspection," which can be downloaded from the NRC website at <http://www.nrc.gov>.*

**Comment:** What has the NRC done to assure and how does the NRC know that the reactor containment vessels at the facility are structurally sound and capable of safe operation for 20 years beyond their "designed to" life? BF-D-E-7 and BF-D-K-7

**Response:** *NRC's ongoing reactor oversight program focuses on prevention of safety problems so that potential issues like aging and thermal shock do not lead to accidents and subsequent environmental impacts. The intent of the NRC's safety review is to determine if the licensee has adequately demonstrated that the effects of aging will not adversely affect any systems, structures, or components identified in 10 CFR 54.4. The safety review process includes site inspections to assess whether the applicant has implemented and complied with the regulations for license renewal. The inspection teams comprise technical, program, and operational experts from the NRC and its consultants. For a license renewal review, teams of specialized inspectors travel to the reactor site at least twice and sometimes three times to verify whether the effects of aging will be managed such that the plant can be operated during the period of extended operation without undue risk to the health and safety of the public. The review results reside in a publicly available safety evaluation report available online at <http://www.nrc.gov>. The comment provides no new information and, therefore, will not be*

*evaluated further in the context of the environmental review. However, the comments will be forwarded to the project manager for the license renewal safety review for consideration.*

**Comment:** Before approval is granted by the NRC to extend reactor life by fifty percent, at least the following should be done as a minimum: TVA should report the total number of automatic shutdowns that have occurred at each Browns Ferry reactor during its operation. The NRC should investigate (and report to the public about) the reportable occurrences, automatic shutdowns, or other safety violations which have occurred at each reactor including the significance of these events relative to the safe operating lifetime of the reactors. BF-D-E-8 and BF-D-K-8

**Comment:** The only response I received from the NRC relative to my comments was that the issue I raised was a safety issue and would be part of the safety review and not part of the environmental review....Hopefully, this issue was dealt with during the safety review, and there is someone at today's meeting that can discuss this and explain the results of the safety review and how the above concerns have been resolved. BF-D-E-5 and BF-D-K-5

**Comment:** I believe that there have been a significant number of automatic shutdowns of the three Browns Ferry reactors. If that is the case, and if what I read about the effects of these events is true, this is of major concern to anyone living in this area or downwind. There is the possibility that one or more of the Browns Ferry containment vessel structures have been weakened and prematurely aged. This could pose a serious threat for the people of the Tennessee Valley, especially considering that the TVA and NRC are in the process of extending the operation of all three reactors fifty percent beyond their "designed" to operational life. BF-D-E-10

**Comment:** During the ten years of initial operation, TVA was plagued by an amazingly large number of reportable occurrences...Over a period of less than four months in the fall of 1980, there were 66 reportable occurrences at the three units or more than one every two days at Browns Ferry facility. These events were fairly evenly distributed among all three reactors (Unit 1 had 23, Unit 2 had 21, and Unit 3 had 22).

If operation during the above time period was typical of Browns Ferry operation over the first ten years, then more than two thousand reportable occurrences would have occurred at Browns Ferry in the first ten years of operation. I couldn't determine at the time how many of the reportable occurrences had resulted in SCRAMS or automatic shutdowns of the nuclear reactor, but my understanding at the time was that automatic shutdowns often occurred.

During the 80s, I read a lot about nuclear power generation. I learned that when an abnormal event triggers an automatic shutdown, it is somewhat of an emergency process. This process is designed to shut down the reactor much more rapidly than when the reaction is shut down using normal operating procedures. The faster-than-normal cooling of the reactor containment structure thermally shocks the structure resulting in great stresses throughout the structure with

the disturbing potential of weakening it. Reportedly, this could result in premature aging of the containment structure. BF-D-E-3 and BF-D-K-3

**Comment:** At that time I raised concern about the safety of the containment structures for the three units as a result of the containment vessels being thermally shocked through repeated automatic shutdowns of the reactor units. I had previously raised this issue with TVA when it requested public comment concerning extending the life of the three reactors in 2001. I received no response from TVA concerning my comments. BF-D-E-1 and BF-D-K-1

**Response:** *As part of the NRC staff's safety review, the integrity of the reactor pressure vessel and torus are subjected to a rigorous safety assessment. The effects of pressure and thermal shock resulting from a scram is not as significant for a boiling water reactor because of the large steam volume of the primary system. Furthermore, the number of scrams in recent operating history of BFN Units 2 and 3 is less than suggested by the comments. In the period 1999 through 2004 there were eight unplanned scrams on Unit 2 and four on Unit 3. NRC's ongoing safety program focuses on prevention of safety problems so that potential issues like aging and thermal shock do not lead to accidents. To the extent that the comments pertaining to safety of equipment and aging are within the scope of license renewal, these issues will be addressed during the parallel safety analysis review performed under 10 CFR Part 54. Operational safety issues are outside the scope of the environmental review and will not be evaluated further in this SEIS. The comments provide no new and significant information; therefore, no changes were made to the SEIS text. However, the comments will be forwarded to the project manager for the license renewal safety review for consideration.*

**Comment:** And during relicensing are there any top priority issues in the maintenance and infrastructure of any of the nuclear power plants? Specifically, Browns Ferry Nuclear Power Plant in Limestone County, Alabama; Sequoyah Nuclear Power Plant, Dekalb and Jackson County; and Joseph M. Farley Nuclear Power Plant of Houston and Henry County. And if so, are any of them manufactured issues waiting to transition over to a newer, better, more advanced technology. BF-D-D-2

**Response:** *Normal maintenance issues at BFN are evaluated during the regular, routine inspections of the plant and plant operations. Infrastructure and other changes that could reduce core damage frequency were evaluated as part of the severe accident mitigation alternatives (SAMA) review, and summarized in Chapter 5 of the SEIS. The SAMA review found that none of the candidate SAMAs were cost-beneficial. The SEIS only considered potential environmental impacts at the BFN site, and did not consider other reactor sites. The comment provided no new and significant information; therefore, no change was made to the SEIS text.*

### **Blended Low Enriched Uranium Fuel**

**Comment:** I want to know if your comments that you would address the issue on the fuel is on the record this time. BF-D-A-19

**Comment:** In a letter dated August 27, 2003, addressed to the Director of the Office of Nuclear Material and Safeguards, which is at the NRC, Framatome began the letter and wrote, and I quote. "As discussed with Mr. Peter Lee of the Fuel Cycle Facilities Branch and various other NRC staff members during a meeting with FANP representatives at your headquarters on July 21, 2003, FANP is planning facility modifications at its Richland, Washington facility to support the processing of Blended Low Enriched Uranium (BLEU)..." And I'm not sure what this is. It says ..." UO<sub>2</sub> powder for use in the fabrication of TVA's BW fuel bundles." The letter is signed by D. W. Parker, Manager, Environmental Health, Safety and Licensing. It is on Framatome letterhead. How can you ignore this information in this EIS? BF-D-A-5 and BF-D-L-4

**Comment:** I ask that you rethink your position on drafting up an EIS that permits TVA to burn nuclear weapons materials in this reactor. I ask that you look at your obligations as public employees and see the wrong in such a decision as permitting this plant to go forward without the analysis for the type of fuel that TVA will burn here. BF-D-A-16

**Comment:** In this place several months ago, Chip, you and the Region II boys and the Rockville staffers all went to great length to assure me that, if the NRC knew that the untried fuel process from the Erwin, Tennessee plant of Nuclear Fuel Services, using France's Framatome process, would be a part of the EIS, when completed. Now that was to be the fuel that was to be used here at this plant for those of you here who don't know. NRC would make that part of the EIS. You quickly stated that I didn't need to worry. Boys, I'm worried. BF-D-A-3 and BF-D-L-2

**Comment:** And I find it remarkable that you still don't want to save the rate payers the cost of another hearing and put the analysis in the EIS. BF-D-A-6 and BF-D-L-5

**Comment:** I can't determine if the NRC staff is the world's largest group of paid snake oil salesmen or just totally incompetent. Maybe you can't read or understand the English language. I don't know. Maybe you don't know how to spell Framatome. Maybe you don't know how to spell NFS. How about if I give you some more clues? BF-D-A-4 and BF-D-L-3

**Comment:** Also, I did notice that you forgot to get the language correct in the transcript copy I received by mail concerning the NFS and Framatome fuel issue. I have a copy here so you will know where to look. This copy came out of your document room in Rockville, prior to your last meeting with me here in this room, and was retrieved down here, in Tennessee, by computer, late one night when I had nothing to do. BF-D-A-8 and BF-D-L-7

**Response:** *TVA does have contracts to purchase Blended Low Enriched Uranium (BLEU) fuel for Units 2 and 3 and BLEU fuel has been delivered to the site. TVA currently does not plan to*

*use BLEU fuel in Unit 1. BLEU fuel is manufactured by downblending weapons-grade, highly enriched uranium (approximately 59 percent U-235) to a level of approximately 3 to 5 percent U-235, which is a typical enrichment level for nuclear power plant fuel. The resulting BLEU fuel is in nearly all respects indistinguishable from fuel created by the normal fuel enrichment and manufacturing processes. The BLEU fuel that TVA will use in Units 2 and 3 meets all of the applicable specifications for these reactors; therefore, switching to BLEU fuel for the reactors does not require a license amendment, and requires no additional environmental review, or public hearings. The use of BLEU fuel likely decreases the environmental impact of plant operations because there would be less offsite impact due to uranium mining, and the downblending process eliminates a stockpile of highly enriched uranium that presents safeguards and security issues. The comments did not provide new and significant information; therefore, no change was made to the text.*

### **Cost of Power**

**Comment:** As we pointed out in our scoping comments, TVA is very close to exceeding its congressionally mandated debt ceiling of \$30 billion. Currently, TVA has about \$25 billion in debt, in addition to \$3 billion to \$5 billion worth of other obligations that could be considered debt (e.g., leaseback contracts, pre-purchase of electricity, etc.). The restart of Browns Ferry Unit 1 is estimated to cost a total of \$1.8 billion. According to NRC regulations related to Supplemental EIS for license renewals [10 CFR 51.95(c)(2)], the SEIS "is not required to include discussion of the economic costs and economic benefits of the proposed action or of alternatives to the proposed action except insofar as such benefits and costs are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or relevant to mitigation." The solvency of TVA certainly appears to be "essential" to making any meaningful comparison of alternative and should be included in the final SEIS. BF-D-O-6

**Comment:** I think the cost-benefit analysis (of nuclear power) has not shown itself to be worthwhile. BF-D-F-3

**Comment:** TVA has spent \$2 billion to restart Browns Ferry Unit. Is it possible that TVA is going to recuperate \$2 billion from one nuclear reactor in 20 years? It doesn't seem likely to me that's going to happen. They abandoned a \$360 million project, a gas-fired power plant at \$150 million into the project, and it was deemed lack of demand. That was in March of '02. So from '02 to now we've come to the point where we need to spend \$3 billion to reactivate a nuclear reactor, and I don't understand how it is going to be paid for or how it is going to pay for itself. The math doesn't work in my head. Maybe I don't know how to add figures that big. It doesn't work for me. BF-D-J-1

**Comment:** This is something that we really need to look at, and the cost of it. I hear that they're talking about – well, no, not here that they're talking about, there's been a huge grant to do a study for Bellefonte. And what did we pump in to an endless pit there, \$4 billion, was it?

Four billion dollars for absolutely nothing now. And now we're going off on some other tangent.  
BF-D-H-11

**Comment:** The economic impact also. I mean how much money is that going to cost? In this area right now TVA, their estimated cost for restarting Unit 1 is \$1.8 billion, which exceeds the U.S. Department of Energy's highest cost estimate by \$100 million. TVA has an existing debt of around \$250 billion and they don't have much more room on that. This is being passed on to their customers. This is a major concern here. BF-D-H-2

**Comment:** How can you tell children, you know, we can burn all the lights we want to and it will be cheap. It is not going to be cheap. It is expensive. TVA has spent a fortune on their power.  
BF-D-H-9

**Response:** *The economic decision made by TVA to pursue relicensing of BFN, in addition to TVA's standing debt, is outside the scope of the environmental review. Specifically, 10 CFR 51.95(c)(2), states that a license renewal EIS does not need to discuss the cost of power. The decision to apply for relicensing is a business decision over which NRC has no regulatory control. The comments provide no new and significant information; therefore, no changes were made to the SEIS text.*

### Operational Safety

**Comment:** TVA had such a horrible operating record in the initial 10 years of operation (1975 to 1985), that all three reactors were shut down in 1985 reportedly due to safety concerns and repeated safety violations. BF-D-E-2 and BF-D-K-2

**Comment:** And with all of these wonderful studies you've done, it still does not address the most crucial issue concerning the operation of this plant. We came seriously close in 1975 to a very major accident, which was reported on the east and west coast before people in this area knew what had happened. BF-D-G-2

**Response:** *The safety record for Units 2 and 3 since they were restarted has been much improved compared to the record prior to 1985. The maintenance and operation of BFN Units 2 and 3 are monitored daily by NRC's onsite inspectors. The onsite inspectors provide quarterly reports of all of their findings; these reports are available on the NRC website. The comments provide no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** The plant itself has got to have a cooling system that works. The paint chip – people say well, painting. Painting don't really matter. Painting does matter. Ask Davis Bessie Plant. Some of you guys probably already know that they had to redo a lot of their painting in their systems too. BF-D-C-7



## Appendix A

**Comment:** The things that I witnessed inside the torus, they're scary. But you guys didn't get a chance to see that because the mess was mopped up, okay. I don't blame TVA for this. I blame the contractor. Okay. TVA is doing the best they can do to straighten the problems out. I realize that. I'm not here to beat them up. BF-D-C-1

**Response:** *The NRC inspectors have evaluated the surface coatings on the interior of the Unit 1 torus, and have determined that TVA's efforts to sandblast and re-application of coatings were successful. The NRC found that the licensee's program for restoration of the coatings in the Unit 1 torus complied with NRC requirements. Repairs to identified coating problems were completed by qualified individuals and accomplished in accordance with approved procedures. The NRC's findings are documented in Inspection Report (IR 000259-04-009) dated February 11, 2005 (Accession No. ML050420392). The comments provided no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** And least you forget, I remind you of the recent 32-ton crane trolley that was dropped between the reactor buildings. And what is worse, you cannot determine if the accident – excuse me, unplanned event – is a safety issue. And you want the public to trust you. BF-D-A-17

**Comment:** We would also like to raise concerns over a serious accident that occurred at Browns Ferry on October 24, 2004 - 32 tons of equipment were dropped onto the refueling floor by a faulty overhead crane. When Browns Ferry exceeds its spent fuel capacity, which certainly will occur if it continues to operate, the overhead crane will likely be used to move and load 100-ton dry storage casks used for storing nuclear waste from the spent fuel pool. The possible devastation that could occur if such a load were dropped is serious, and needs to be addressed well before the reactors are relicensed or Unit 1 is brought back online. BF-D-O-3

**Response:** *The comments refer to an October 24, 2004, event in which the original 29 MT (32-ton) bridge crane trolley was dropped approximately 1.22 m (4 ft) when a synthetic sling failed. The drop resulted in surface cracking and spalling of the concrete ceiling beneath the point of impact on the Unit 1 refueling floor. The root cause of the event was fully evaluated, and it was determined that the sling failure was the result of inadequate procedure and poor work performance. The NRC found the event to be of very low safety significance. The NRC resident inspectors issued a finding regarding this event and the licensee entered it into its corrective action program. An independent structural engineer was commissioned by the licensee to evaluate the structural integrity of the floor at the point of impact to determine if the floor still met its design criteria. There was no permanent structural damage to the refuel floor, and there was no functional degradation. The resident inspector's report of this incident is available through the NRC ADAMS website under accession number ML050310001. The comment provides no new and significant information; therefore, no change was made to the SEIS text.*

**Comment:** I found out that 15 percent of the energy that is derived from the 375 nuclear power stations in the United States that six are on a critical list, and one of them happens to be Browns Ferry Nuclear Power Plant—or was as of 1988. And that was my concern and still is my main issue...What is the Nuclear Regulatory Commission doing to reduce the factors that makes Browns Ferry Nuclear Power Plant one of these ones that is or was on the critical list as of 1988? BF-D-D-1

**Response:** *The NRC no longer maintains a critical, or watch, list of poorly performing plants. The watch list was an element of the NRC's Systematic Assessment of Licensee Performance program, which was superceded in 2000 by the revised Reactor Oversight Process (ROP). Since the implementation of the ROP, the operating BFN units have never left the Licensee Response Band, which is the best performance category in the ROP. Notwithstanding this information, operational safety issues are outside the scope of 10 CFR Part 51 and will not be evaluated further in this SEIS.*

### **Restart of Browns Ferry Unit 1**

**Comment:** When you look at Mr. James Speegle, here, how do you look him in the eye and tell him that you, the NRC, cannot stop the abuse because you refuse to do what is required to stop the abuse of those such as Mr. Speegle that feel that public health and safety is important and refuse to take the abuse from TVA managers over safety problems? BF-D-A-13

**Comment:** That whole contracting company up there filed bankruptcy years ago. They're using this, at the cost of safety to everyone in this community, to regain what they lost years ago. That's not our fault. That's bad management. TVA may or may not want to look into this of you getting another contractor. Obviously, I was right about the things I complained about, or Williams Power would never have been brought in to redo what Stone and Webster worked on for almost a year. BF-D-C-6

**Comment:** The gentleman onsite that conducted all this stuff has made the comments in the last two weeks that he has been cleared of all charges. I haven't even gotten a report from NRC yet saying what the results were. He's saying NRC is telling him this. It makes me, and other people, think that NRC is helping cover things up. I don't look at it that way. I hate to. But this gentleman onsite is a safety issue himself. BF-D-C-5

**Comment:** I don't know how to stress to you the importance of how it is to get this situation under control, because the same people that done this in the torus are the same people still up there running things in that plant. Everything from the lead, everything from the non-lead that was treated like lead, and then created so much toxic chemicals that, ultimately, TVA has got to pay to have it buried or put somewhere. I mean why do you want to create waste when it didn't have to be created? They made money on it. They claim 150 and 60 spots of lead removal a day. We couldn't do 20. With the crew we had, I promise you, we couldn't do 20. BF-D-C-17

## Appendix A

**Comment:** It's a shame to have to stand here and look like I'm degrading somebody because they fired me. That's not what I'm here for. I was paid \$1200 a week; I went down to \$210 and it took eight weeks to get that. I was financially hurt from this. That wasn't what I done it for. I could have kept my mouth shut and went on. I didn't. I did this for the community and for the fact that I know that was being done wrong up there. And like I said, if I was wrong about what I complained about, they never would have spent those many millions of dollars to have it redone. BF-D-C-12

**Comment:** So I would like to ask you all today if you all would please find out who instructed it to be redone as far as the inside of that torus. Who come up with the initiative to say, hey, maybe there is a problem. Let's stop back and find out what we got to do. All they had to do was listen to the people inside the plant that knew what to do to begin with, and that was to sandblast it from water line to water line and the problem never would have occurred. BF-D-C-13

**Comment:** The thing that bothers me the most is when a man from supervision will stand there and tell you: Don't worry about it. They'll pay you come Wednesday. Confusion is money. If they don't like the way we done it this time, it tears me up, we'll do it again, and they'll pay us for it. These are not people that are worried about safety. These are people that are worried about filling their pocketbooks to where they can go back home, stay there, and live comfortably, and let us have to deal with the problems they caused at this plant. BF-D-C-3

**Comment:** We skipped around over rust. And every time we would ask why are we missing this spot and doing this one? Our answers we got back were "They'll pay us to do it on another contract." Well, that's wrong. That is greed. And they threw safety out the window for greed. BF-D-C-14

**Comment:** Thank you TVA for making sure this thing is done right. I really appreciate that. I think you all had a big part in the overall redo of this torus. But I spoke up, exactly what your open-door policies tells me to do. And it says there's no reprisals towards anyone for speaking up. Well, I got reprised against me. They run me off. Cost me my livelihood. I can't hardly work anywhere anymore. I can't get a job paying anything near what I was making up there. And it's not because I'm not skilled, it's because I got tired of looking at what was going on. BF-D-C-15

**Comment:** Like I said, I don't blame TVA for this. I blame the contractor. But ultimately, somebody has got to clean house. And I think somebody needs to start cleaning house pretty soon before we have major problems that we can't correct. BF-D-C-11

**Comment:** Like I said, I could have kept my mouth shut and made my \$1200 a week and took my family on vacations. I didn't do that. I stood up for what this paper right here tells me what I should and could do. And I got fired for it. And it is because people threw safety out the door and wanted to get their pockets full of money. And that's basically all it came down to. And I'm asking you guys to keep an eye on the safety. BF-D-C-18

**Comment:** I was in that torus and two milestones were missed. Now that might have been Stone and Webster's milestones; it might have been TVA's milestones. But they were missed. Because every time we go to the point of finishing up, they would come and say, hey, we're not going to make it. And when they would talk about milestones, everybody knows here they're talking about money, their bonuses. Cut the bonuses out. Make them do it right. If the job ain't right, don't pay them. BF-D-C-16

**Comment:** I know that you won't go in and do the inspections and everything. Please do a really good job, because on Unit 1 there have been a number of whistle blowers that have lost their jobs. One acquaintance of mine is an avid supporter of nuclear power. He did his job; saw things that should have been done in other ways, or were not being done properly; he lost his job. Things like this are going on. When we almost had the melt down with the first accident, I knew some of the people that worked at Browns Ferry, and one of them was a operator who was a severe alcoholic. He was killed in a car wreck on the way to work. I thought okay, it's better now. We don't really have to worry about this, you know. TVA has really cleaned up their act and they're doing a better job. Then, when I hear about all of these whistle blowers with Unit 1, that's scary. That's really scary. And I did know this guy, and he was an operator. BF-D-H-4

**Response:** *The NRC's environmental review is confined to environmental matters relevant to license renewal. The NRC inspectors have evaluated the surface coatings on the interior of the Unit 1 torus and have determined that TVA's efforts to sandblast and re-apply a protective coating was successful. The NRC found that the licensee's program for restoration of the coatings in the Unit 1 torus complied with NRC requirements. Repairs to the coating were completed by qualified individuals and accomplished in accordance with approved procedures. The staff's findings are documented in Inspection Report IR 05000259-04-009 dated February 11, 2005 (ML050420392). The comments provide no new and significant information; therefore, no changes were made to the SEIS text.*

**Comment:** Since this unit is not operating, I find it remarkable that you base these decisions on operations when they aren't operating. BF-D-A-1

**Comment:** I worked on Unit 3. Nothing in Unit 1 has been done the way Unit 3 was revamped and redone back in the early 90s. Nothing. Everything has changed differently. The torus was redone right. BF-D-C-9

**Comment:** Browns Ferry Unit 1 has been in the non-defined regulatory status of "administrative hold" for nearly 20 years, which is a longer time period than it actually operated. The operating license for Unit 1 should have been revoked after it was shut down in 1985 for failing "to consistently maintain a documented design basis and to control the plant's configuration in accordance with that basis." To ensure optimal safety at the plant, TVA should now be required to go through NRC's license application process for Unit 1 as required for any new plant. Only after an extended period of operation without any incident or accident should TVA be allowed to apply for a license extension. To give a license extension to a plant that has

## Appendix A

not operated in 20 years is utterly absurd. We are further concerned over safety allegations brought forward by former contractors that performed work for the Browns Ferry Unit 1 Restart process, citing that poor practices have occurred and work has been done outside of design specifications. Until the safety allegations can be thoroughly reviewed by the NRC, the restart should not go forward, and consequently, the relicensing of Unit 1, in particular, should not be allowed. BF-D-O-2

**Response:** *TVA is currently in the process of preparing Unit 1 for restart. This action is occurring under the current operating license. The restart of this unit does not require a separate licensing action and is not part of license renewal. Unit 1 must meet the current licensing requirements prior to restart. The NRC has a special reactor oversight program to assess licensees' activities and progress related to readying Unit 1 for restart. Restart of Unit 1 is outside the scope of the environmental review for license renewal. The comments provide no new and significant information; therefore, no changes were made to the SEIS text.*

### **Safeguards and Security**

**Comment:** Jackie mentioned 911. We all thought these worst-case scenarios were ridiculous and are never going to happen; that people projected that this could happen 30 years ago or if not longer, and now we're in the age of the worst-case scenario. I think it is absurd not to be addressing these issues primarily and foremost, especially since the citizens' money is going to fund these projects without them having all of the information out there in front of them. I think it is really immoral. BF-D-G-5

**Response:** *NRC and other Federal agencies have heightened vigilance and implemented initiatives to evaluate and respond to possible threats posed by terrorists, including the use of aircraft against commercial nuclear power plants and independent spent fuel storage installations (ISFSIs). Malevolent acts remain speculative and beyond the scope of a NEPA review. The NRC routinely assesses threats and other information provided by other Federal agencies and sources. The NRC also ensures that licensees meet appropriate security levels. The NRC will continue to focus on prevention of terrorist acts for all nuclear facilities and will not focus on site-specific evaluations of speculative environmental impacts. While these are legitimate matters of concern, they should continue to be addressed through the ongoing regulatory process as a current and generic regulatory issue that affects all nuclear facilities and many activities conducted at nuclear facilities. The NRC has taken a number of actions to respond to the events of September 11, 2001, and plans to take additional measures. However, the issue of security and risk from malevolent acts at nuclear power plants is not unique to facilities that have requested a renewal to their license and, therefore, will not be addressed within the scope of this SEIS. The comment did not provide new and significant information and does not pertain to the scope of license renewals set forth in 10 CFR Parts 51 and 54; therefore, it will not be evaluated further.*

**Comment:** The three Browns Ferry nuclear reactors are all BWR-Mark I GE-4 design, which has numerous inherent security flaws: the spent-fuel pool is elevated above ground level,

making it vulnerable from above, below, and from the side; the reactor itself is located above ground level; and the reactor lacks a traditional "containment dome" and instead has a thin steel shell. Of the 104 nuclear reactors in the United States, 34 have these particular vulnerabilities to acts of terrorism. The Nuclear Security Coalition, of which Public Citizen and SACE are members, have submitted a petition to the NRC that requests the NRC to provide stronger defenses of boiling-water reactors (BWRs) with Mark I and II containments and their spent fuel. We have attached the Coalition's NRC petition and petition annex to these comments. Given the serious vulnerabilities of these types of reactors to attack, this petition should be fully considered and acted upon by the Commission before decisions are made about relicensing any of the Mark I and II BWRs, including the three reactors at Browns Ferry. BF-D-O-1

**Response:** *The petition referenced in this comment was submitted to the NRC on August 10, 2004, under separate cover and is being evaluated by the NRC staff under 10 CFR 2.206 independently of the BFN license renewal. The 33 page petition attached to the comment was not reproduced in this SEIS because it had been submitted separately to the NRC for consideration, and the petition is outside the scope of the environmental review. The petition is available from ADAMS at the NRC website <http://www/nrc.gov/reading-rm/adams.html> under accession number ML050630419. As part of a comprehensive review of security for NRC-licensed facilities, the NRC conducted detailed site-specific engineering studies of a limited number of nuclear power plants to assess potential vulnerabilities of deliberate attacks involving large commercial aircraft. These studies found that the potential for core damage or radiological releases that could affect public health were low. Additional site-specific analyses are underway or being planned. The issues raised in this petition are outside the scope of license renewal and will be addressed as part of a response to a 2.206 petition. The comment provided no new and significant information; therefore, no change was made to the SEIS text.*

**Transcript of the Afternoon Public Meeting on  
January 25, 2005, Athens, Alabama**

**Afternoon session (1:30 to 4:00 p.m.)**

[Introduction by Chip Cameron]

[Presentation by Andy Kugler]

[Presentation by Michael Masnik]

MR. CAMERON: Thank you, Mike.

Questions about process at this point?

Yes, sir, and please identify yourself.

Appendix A

MR. HORN: Stewart Horn.

Did you issue the draft SEIS in November or was that the draft GEIS?

MR. MASNIK: It is a bit confusing. There are two documents. There is a Generic Environmental Impact Statement, which was issued in 1996, that looked at, in a generic sense, the process of re-licensing plants and evaluated impacts of license renewal on a generic basis.

What we do then -- and Mike will discuss this a little bit further in a few minutes -- but what we do then is, we also do a Site Specific Environmental Impact Statement, which we consider a supplement to this generic. So you have to sort of look at both of them, although the SEIS, or the Supplement to the Environment Impact Statement, does discuss the specific issues even raised in the GEIS.

MR. CAMERON: Does that clear it up for --

MR. MASNIK: I know it is a bit complicated, but why don't you listen to Mike's evaluation and, then, if there are further questions, we can answer it.

MR. CAMERON: All right.

Yes.

MS. KNOX: I have several other things I wanted to talk about.

My name is Dawn Knox. I have several other questions I wanted to ask, but I heard you say that at your scope there was no talk of hearings. Is that something that can still be brought up in the future, or did that have to be something that was decided at the scope?

MR. CAMERON: Can you clarify for Dawn what you meant when you talked about -- that's right, Andy mentioned it -- can you clarify what the hearing was that you were talking about?

MR. KUGLER: Well, it wasn't related to scoping. Scoping is an environmental process where we're looking to determine what issues we should be looking at when we develop the Environmental Impact Statement.

Separate from that, there was an opportunity to request a hearing and that started when we determined that the application was sufficient for our review. We issued a Federal Register notice stating that we had this application, it is sufficient for review, and it would have provided for a 60-day opportunity to request a hearing. Now, this was back last year. It would have been in the spring time. I don't know the exact dates. We could get those. But that opportunity has closed. It closed back at that time, and that was the opportunity to request a hearing.

MR. CAMERON: This hearing that Andy is talking about, it's not like a public meeting like this is, it's an adjudicatory hearing; is that correct, Andy?

MR. KUGLER: That's correct. It is a formal process in front of an administrative law group or a panel of administrative law judges.

What we are doing here -- sometimes people refer to this as a hearing. This is a public meeting. For us the term "hearing" has a different meaning. It is much more formal. It's a legal process.

MS. KNOX: Who would have had to request a hearing?

MR. KUGLER: Anybody can request the hearing. Anybody who has an interest in the review. They do have to -- well, I'm going to get beyond my range here. I may have the lawyer speak to this, but they have to establish standing, which means that they have an interest that they can show in the activity. They have to then submit contentions, issues that they have with the application that was received.

MR. CAMERON: Dawn, what Andy is saying is that anyone can request one of these to participate in the adjudicatory hearing, but they won't necessarily be permitted to participate unless they meet certain requirements.

In regard to your question about is there any way that someone could request a hearing, now I'm going to ask -- not to get in to it now, but I'm going to ask our attorney, Ann Hodgdon, who is over there, to talk to you about something called -- how you do a late filed request, okay?

Did you have another question on process before we go on?

MS. KNOX: That was my question.

MR. CAMERON: That was it?

MS. KNOX: Yes.

MR. CAMERON: Thank you, Dawn.

Other? Other questions? (No response)

We're going to go to Dr. Mike Sackschewsky and, as I mentioned, he's the team leader for the environmental review. He's going to go through the findings in the Draft Environmental Impact Statement and, then, we'll go back out to you for questions on that.

Mike.



Appendix A

[Presentation by Michael Sackschewsky]

MR. CAMERON: Thank you very much.

Before we go to questions, if I may just introduce one other person from the NRC staff, Mr. P. T. Kuo right here. And P. T. is the Chief of the License Renewal and Environmental Impacts Program. So he's in charge of not only the environmental review that we're talking about but also the safety site review.

Thank you for being here, P.T.

Questions about the draft EIS?

Yes, sir, and please introduce yourself to us.

MR. LAWSON: Hi, I'm Brian Lawson with the Huntsville Times.

As you described the conclusions, and as you reviewed other sites, in your experience is it typical to find what amounts to no significance across the board? Is that an unusual finding for you or does that run consistent with other experiences you've had?

MR. SACKSCHEWSKY: That is fairly consistent with, I think, most of the other reviews that have been done.

MR. CAMERON: Okay. Mike are you going to amplify -- okay. That's fine.

Yes, sir, and, then, we'll go back to him.

MR. SHEAR: Dennis Shear, I'm with the Times Daily Newspaper in Florence.

Have there been any applications for a new -- you all have said, hey, this is not going to work or have you all seen no significant impact?

MR. CAMERON: And this is in terms of license renewal applications.

MR. MASNIK: It is Mike Masnik.

It is a good question. We get that question quite often. We have done over 20 of these reviews so far and in each case the license renewal has been granted. There's a number in house under review at this time.

The reason for that is -- there's a couple of reasons for it. First, this is a fairly well-defined process at this point. The licensees know what to submit and what they have to submit and what we look at.

So, typically, since this costs a licensee a lot of money, their application, in almost every case, is fairly complete.

It is also an iterative process in a way in that, if there are shortcomings in the application -- and just about every application has some areas where we need some additional information. As I mentioned, we got 11,000 pages of material from the licensee. That information is provided. If it's insufficient, we might go back to the licensee a second time.

Additionally, if there are inspections and the inspections demonstrate that there's some weaknesses in the facility's aging program, the licensee would obviously make improvements to that program to the extent that we probably would be satisfied.

So the answer is no, we have not turned down a licensee, but I think there is a pretty good reason why that's the case so far.

MR. CAMERON: Thanks, Mike.

Let's go to Ann.

MS. HARRIS: I've got five questions.

MR. CAMERON: Okay. This is Ann Harris for the record. Do you want to ask them all at once and, then, we'll answer?

MS. HARRIS: It is up to you.

MR. CAMERON: Why don't you give us all five and, then, we'll proceed to answer them 'cause I think that will be more efficient. Okay?

MS. HARRIS: Talking about the cumulative effect here of what you found, and I want to know if that cumulative effect was determined on separate units or you combined all three of 'em to come to what Unit 1 will do? Was it totally separate throughout the decision on cumulative effects?

The other thing is, I see that you talk about cumulative effects but I'm not sure that what you are using as cumulative effects is the reactor, the design, the safety, the whole. Did you add of that? I'm seeing something different whenever you talk about emissions.

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When you determine the cumulative effect of emissions, what is the basis and what was the model that you used? What is the level? And what are the percentage of waste increase from the use of fuel? I didn't see that there any where.

There has to be an increase if you are going to use a new unit, because it is going to produce waste.

From the current level here what is Unit 1's waste analysis done totally alone? And if so, why?

MR. MASNIK: Can you repeat that? I couldn't follow that one.

MS. HARRIS: Well, Unit 1 waste. During the analysis you didn't find any problems with it, but you also didn't talk about what that waste is going to come from. I want to know what percentage or level of increase of waste that you determined would increase above what Unit 2 and 3 are now producing.

MR. CAMERON: Is that the last?

MS. HARRIS: Right now.

MR. CAMERON: Mike, do you want to -- let's try to -- I know it's a lot to keep tract of. Let's try to answer Ann's questions as best we can, and, then, we'll check with her to see if we got it.

MR. MASNIK: I guess your first question was: did we look at -- when we evaluated cumulative affects, did we look at separating Unit 1 from Units 2 and 3?

The answer is no.

I think your specific question from the standpoint of cumulative affects related to generation of additional waste and emissions. Okay. As Mike described, both the issue related to the fuel cycle and the radiological releases from the plant were considered Category 1 issues, which means that we considered them generically back in the early 90s and determined that the impacts would be the same for all facilities. We also determined that the impacts would be small.

From the standpoint of the waste issue, the additional waste that would be generated from Unit 1 for an additional 20 years, the Commission believes this is an acceptable amount and that the waste would ultimately end up in a repository somewhere, you know, a permanent repository.

From the standpoint of emissions, again, the amount of radiological releases from the plant are extremely small. As a result, the additional 20 years we feel would not result in any releases

that are outside our regulations. So again, it would be a generic determination and a Category 1 issue.

MR. CAMERON: Ann, is there anything else that we didn't --

MS. HARRIS: You didn't answer my question.

MR. KUGLER: Chip, let me add one more thing because I think this may be what she's asking about, and I'm not sure Mike hit it.

When we were looking at emissions from the plant, liquid and gaseous emissions, we applied a multiplication factor of one-point-eight to consider the addition of Unit 1, the third unit, and to consider the uprated power level as well because we did all of this analysis assuming that the plants were operating 120 percent power, because Tennessee Valley Authority has applied for an uprate.

Now that uprate hasn't been completed, but in order to make this analysis conservative, we worked with the assumption that the uprate happened so that we would be basically doing the worse case, the higher power level. So that's considered within the way we looked at the emissions from the plant as well.

MR. CAMERON: Is your main concern addressed here?

MS. HARRIS: No. I got a lot of nuke speak which didn't mean anything.

What I'm looking for is, if you didn't look at the percentage of waste increase, you had -- there has to be a waste increase. You're starting up basically a new unit. If you don't have an increase in waste, whose eating it.

The other thing is, if there is a waste increase, I want to know how much it is.

MR. CAMERON: That's two separate questions here. One is a factual question in terms of how much additional waste will be produced over the license renewal extension? I mean we should be able to have a number for that either now or before we adjourn. That's a factual question that we should have an answer for, hopefully.

The other point is -- I think the implication of Ann's question is, if the plant that's going to be running longer, i.e., the licenses renewed, then more waste is being produced and that would lead us to a negative conclusion.

I think what you're saying is that, even though there would be more waste produced, it's still within our analysis that it's a small impact. That's the answer; is that correct?

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MR. KUGLER: Yes, that's correct.

What we tried to do here was, you've got two units running and we know how much waste they're producing every year. We have data on that. You add a third unit in to operation, it will produce about the same amount of waste and effluents. Now, if you increase the power level of those plants, that will increase the amount of effluents.

What we did was, in our analysis we tried to take both of those things in to account, the addition of Unit 1 running and the increase in the power levels of the plants. We tried to take both of those things in to account in our analysis.

MR. CAMERON: And are concluded in --

MR. KUGLER: And our conclusions are based on those higher effluent levels.

MR. CAMERON: If at some point we can find out the exact number, we --

MS. HARRIS: Did I understand you to say that you considered it's a negligible impact over a 20-year period for this one unit?

MR. KUGLER: What we concluded was that the impacts on the environment would be small with the additional unit running, yes.

MS. HARRIS: The answer would be yes.

MR. KUGLER: I didn't use the word negligible because I'm not sure we're saying negligible. We said small. Maybe it is just semantics.

MR. CAMERON: But that is the conclusion, it's small.

MR. KUGLER: We define small as an impact that is not significant to the environment, yes.

MR. CAMERON: Let me ask Barry Zalcman if he has something to add here.

MR. ZALCMAN: Thanks, Chip.

I think one of the issues that may be confusing is Unit 1 (Browns Ferry) is an operating nuclear power plant. It has a license to operate. It has been operated for some time, but the staff has already evaluated the impacts of operating that nuclear power plant for its initial term. This action is to look at the additional 20 years of operation.

So we have looked at the impact of three plants operating. The restart of Unit 1 is not part of this licensing action. As a matter of fact, it is not a licensing action. They have an operating license. So the cumulative impacts look at the individual as well as the combined effects at Browns Ferry.

MR. CAMERON: Thank you.

Did we have someone over here? Yes, sir. Please introduce yourself to us.

MR. WILLIS: It is Bill Willis with the News Courier newspaper here in Athens. Have any other TVA plants gone through this review process for license renewal? Does the agency have any track record.

MR. CAMERON: Michael.

MR. MASNIK: No. This is the first units from TVA to come in for license renewal.

MR. CAMERON: Thank you.

We will go to -- please introduce yourself.

MS. LEG: My name is Julie Leg.

I just have a general question about licensing in general. Why is the licensing period for so long? Why 20 years? Why 40 years?

MR. CAMERON: We are going to go to Barry Zalzman of the NRC staff again.

MR. ZALCMAN: Thank you very much. A very good question. Its like why is your driver's license good for five years.

The fact of the matter is, when Congress first established the Atomic Energy Act and allowed the Atomic Energy Commission, and subsequently the Nuclear Regulatory Commission, to issue licenses, there was some questions as to how long.

From an engineering perspective there is no real limitation on the length of licenses, but from economic considerations and anti-trust considerations; Congress believed that 40 years was a reasonable period of time.

So it stems back from that.

And for license renewal the staff, while granted the authority under the Atomic Energy Act to renew licenses, had no mechanism for renewing licenses. So when we embarked on that

## Appendix A

process in the late 80s and through the early 90s, that was the mechanism involving the public in establishing a rule. Through that rulemaking process we had public engagement, state public utility commissioners engaging in that process and found that the 20 year period was a reasonably long panning horizon, so that energy supplies could be provided with assurity for public and public use.

So these are time frames, in part, established by Congress for the Agency to deal with, and now by rule, engaging public in that rulemaking process.

MS. LEG: Is it just every 20 years? Are the plants just audited every 20 years and, then, get re-licensed or are they audited otherwise?

MR. CAMERON: I'm assuming that Julie is using the term "audited" to mean inspected or some type of NRC review.

So Barry, are you going to answer that for us?

MR. ZALCMAN: I can respond only because I'm the closest to the microphone.

The reality is, the staff is performing oversight at this facility every day.

As Andy indicated earlier, we have NRC resident inspectors that are part of the NRC core that are located at the facility that live in the community, part of inspection team activities that go on day in and day out. That's their job.

There are special team inspections, there are augmented team inspections, a variety of other inspections that are led by regions. So we have a regional representative.

So there are other inspections that go on and on, on a continuing basis. And, then, if we need some special inside or technical expertise, even folks out of headquarters come in. But it's not a snapshot in time; it is a continuum. Inspection activities go on every day.

MR. CAMERON: Dawn?

MS. KNOX: I know earlier Mr. Kugler, I believe, had said that the safety evaluation report had not yet been conducted, but at the same time does that mean that you all have evaluated the maximum amount of millirems for exposure? Is that still 25 millirems?

MR. CAMERON: I think we are going to have to change batteries in this at some point, but do you get the gist of Dawn's question?

MR. MASNIK: Can we go back to slide 5 just real quick?

Just so there's no misunderstanding, there's both an environmental and a safety review. We're talking about the environmental review, but your comment is an environmental comment in the sense that we concern ourselves with the release of radionuclides from the facility and the off-site dose consequences of that.

There are very prescriptive requirements for how much radiation that can be released from the plant. There are also many layers of protection to prevent the release of radioactivity. Radioactivity is allowed to be released from the plant only from monitored release points.

And we calculate -- or the licensee calculates -- and the NRC makes sure these calculations are correct -- how much radioactive isotopes are released to the environment.

They are required annually to submit a report to us that essentially summarizes the previous year's worth of data, and they actually do dose calculations and determine what the maximum number might be to a member of the public that, for example, lives along the shoreline and eats fish out of the river and spends 500 hours a year at the shoreline.

So it is a very conservative estimate. It's a very small amount. I can't certainly give you those numbers afterwards. I have them. I even have a copy of the report. You know, it's not much.

I just wanted to show you here again the environmental review on the lower and the safety review on the top.

MR. CAMERON: Did you have another question?

MS. LEG: Yes, sir, several more as a matter of fact.

Where is the permanent toxic waste repository in the United States located that is to have been operational by the year 1998, as mandated by the National Waste Policy Act of 1982?

MR. SACKSCHEWSKY: It's the High-Level Waste Repository I believe is what you're referring to, and this is where the spent fuel will ultimately end up in the United States.

I think you know, and most people in this room know, that has been proposed for Yucca Mountain. There have been studies that have been done for many years. It's a facility that will be licensed by the Department of Energy and it will, if licensed, end up taking all the fuel. That licensing process has slowed down and bogged down and is not done yet.

MR. CAMERON: Just one clarification on what Mike said is that the repository will be licensed by the NRC.

MR. SACKSCHEWSKY: Yes.



Appendix A

MR. CAMERON: The Department of Energy has to get a license from us, meet our regulations before it could construct and operate the repository.

They originally were going to submit a license application in December of last year but have delayed that for several months into the future, so we do not have a license application.

MS. LEG: You said Yucca Mountain where?

MR. SACKSCHEWSKY: It's Yucca Mountain in Nevada.

MS. LEG: Are there any intentions of integrating Browns Ferry Nuclear Power Plant of Limestone County from a boiling water reactor to a pressurized water reactor as those at Sequoia Nuclear Power Plant of DeKalb and Jackson Counties and Joseph M. Farley Plant of Houston and Henry Counties, or are heavy water reactors with the use of deuterium may be an option or high-temperature gas reactors?

MR. SACKSCHEWSKY: I missed the first part of that.

MR. CAMERON: I believe the gist of this is, is there any plan to convert any of the reactors at Browns Ferry to some different reactor process than what they are now from boiling water to pressurized?

MR. SACKSCHEWSKY: No, ma'am. I mean its practically physically impossible to do that.

MR. CAMERON: Do you have another question, and, then, we are going to try to push on.

MS. LEG: Does the local government or officials have to approve an evacuation route before a breeder or factory reactor can be approved for a licensing operation by the Nuclear Regulatory Commission?

And does our local government have or hold a ban or restriction on development to keep plutonium out of the Tennessee Valley because of its 24-year half-life and toxicity?

MR. CAMERON: I think the best thing you can do in response to that question is perhaps just talk briefly about what the emergency planning regulations and the role of local government without worrying particularly about the breeder or whatever.

In other words, what is applicable to the Browns Ferry reactors now in terms of local government.

MR. MASNIK: There are no plans currently for a breeder reactor, and it is the policy of the United States not to pursue breeder reactor technology.

From the standpoint of emergency planning the NRC requires that there be an emergency plan, and the NRC works closely with FEMA (Federal Emergency Management Authority) to produce an emergency -- well, the licensee produces an emergency plan. We oversee the plan as well as FEMA and that requires local participation. I believe there are one or two people here today from the local Emergency Planning Program in Limestone County or the area around the plant.

MR. CAMERON: And Dawn, I know you have some other questions. Let's go to the public comment part of the meeting, and, then, we'll make sure that we get back to you either during the formal part of the meeting or right afterwards to answer any questions that you have.

For local government officials who are here or who know about emergency planning, perhaps after the meeting they can also explain it to Dawn.

Let's go to Mr. Horn?

MR. HORN: My understanding of this process is that it will be completed and a decision will be made probably within a year or close to it; is that correct?

MR. CAMERON: Can we get on the record about when will the decision on license renewal for this plant be made?

MR. MASNIK: I have a schedule. It will take me a minute or two to look at it. I don't know off the top of my head when the date is.

MR. CAMERON: He has another question while you are looking that date up. Go ahead, sir.

MR. HORN: I'm assuming this process will be completed within at least seven, maybe more, years prior to the time the first plant will start operating or maybe six years, but the last one like ten years. Is there a process such that circumstances that may change in the operation of the facility that would affect the environmental impact will be considered after this process has been completed, between the time it is completed and when the actual operation of the renewed license will occur?

MR. CAMERON: In other words, how do we factor in any new information that we might get that would affect the operation of the plant in terms of environmental impact?

MR. MASNIK: Whenever the licensee makes a change to the facility they're required to do a certain number of reviews. One of the reviews is to determine whether or not the change will result in an environmental impact that's outside what was previously considered. Once this document is issued final, it becomes the document by which the licensee will compare -- along with the original EIS, compare any future impacts.

## Appendix A

So let's say the licensee in four or five years decides to totally redesign the cooling system. If it would result in impacts greater than what was considered by the NRC in our document here or the original environmental impact statement, then the licensee would be required to come in and we would be required to do another environmental review.

So this establishes an envelope, essentially, over the facility under which the licensee can operate.

MR. HORN: The approval process basically is completed at the time that this decision is made; is that correct?

MR. MASNIK: That's correct.

MR. CAMERON: Go ahead. Thank you.

MR. MASNIK: I think someone has the date. April of 2006 is what our current schedule proposes that a decision would be made.

MR. CAMERON: Yes, sir.

MR. TIMBERLAKE: Ralph Timberlake.

I was concerned. You talk about the chemical effect on our environmental but isn't it nuclear waste that is going to have to be transported to Yucca Mountain, and have you done this study along the route and possible route of how it will affect the environment during the transmission? Also in bringing in the nuclear fuel in the refueling of the nuclear reactor.

MR. MASNIK: It's a little known fact -- I mean nuclear fuel is transported on the roads of the United States almost every day, somewhere in the country.

The industry has had a long experience with transferring spent nuclear fuel, and there are NRC requirements that are imposed on shippers. It's a pretty routine process. The vehicles are placarded. There's limits as to what the radiation field can be in around the transport vehicle, as well as protection to the driver.

As far as new fuel, new fuel is relatively benign, although it again is transported on a daily basis, and there are requirements for it as well.

MR. CAMERON: I think the nature of the question goes to how did either the Generic Environmental Impact Statement or the supplement consider transportation of spent fuel. I think Mike referred to that earlier.

Isn't that what you wanted to know is how that type of impact was considered in the Environmental Impact Statement? Did Barry answer that?

MR. ZALCMAN: Barry Zalzman again. Very good question. Let me point out that in the presentation we made we refer to the Generic Environmental Impact Statement being completed in a 1996 time frame.

In that time frame this was an open issue. As a matter of fact it was Category 2 issue at the time. The Commission felt that the staff could do a little more work in focusing on what the cumulative impacts would be of transporting all this spent fuel. So any one licensee that sought a license renewal application would have to look at the cumulative impacts across all plants in the country. So, the staff undertook that effort.

In 1999 the staff completed an Addendum 1 to the Generic Environmental Impact Statement. So, when you look at this issue, and you had raised earlier about the repository in general, in Chapter 6 of this supplement we refer to the objective that the Commission had. The conclusion that it had made, which was not just the 1996 Generic Environmental Impact Statement, but also in the Addendum 1 to the Generic Environmental Impact Statement. So the staff did that evaluation. The staff did publish its results. It is available, and if you have that interest we'll make sure we get you a copy.

MR. CAMERON: Thank you, Barry.

We're going to go to that part of the meeting where we listen to all of you and -- oh, we have one more presentation. Excuse me for forgetting about Bob Palla. Very important subject, Severe Accident Mitigation Alternatives. It is in the Draft Environmental Impact Statement.

[Presentation by Bob Palla]

MR. CAMERON: Thank you, Bob. We have a couple of questions for you.

MR. SPEEGLE: Yes. My name is James Speegle and was a painter at Brown Ferry Nuclear Plant.

You were talking about the costs of doing these jobs to get this plant in a safe manner, is that -- am I understanding you correctly in that? You were talking about the overall impact of the cost plus the safety involved.

MR. PALLA: What we look at is, in essence, the existing level of risk that this plant poses, and we decompose the risk profile to try to understand if there are cost beneficial improvements that could be made to further reduce the risk.

## Appendix A

So we're looking at the amount of risk reduction that is possible, and different areas that contribute to risk, and we look at the costs of achieving reduction.

MR. CAMERON: But the basic assumption is, though, the plant is at a safe level and what we're looking at is increases.

MR. PALLA: Absolutely. We're not questioning the level of risk. The level of risk is acceptable by the measures that the Commission uses. We are looking at cost-beneficial ways of further reducing it.

MR. SPEEGLE: What I'm getting at is, basically, we went into the torus and we worked on this thing for almost the better part of a year doing it the wrong way, and, then, we had another contractor come in and mop up the mess and do it the right way. Did they factor in doing that torus two times, financially?

The safety impact of it alone is just unreal because you were not -- not NRC directly nor TVA. I'm referring this to the contractors. They were going to cut corners, and safety corners were more important. They wanted to make the dollar and cut the safety out. They weren't doing the job correctly. And now that its went back and been done correctly, who made the decision to go back in there and have it redone?

MR. PALLA: You're really bringing up an operational issue that -- I guess what I'd say is we are starting from a baseline where the plant is assumed to be operating in accordance with its design basis.

And the types of activities you are describing may be more related to maintaining the plant's operating basis.

It's not the type -- we were looking, really, at the potential for accidents to occur at the plant and ways to reduce that.

MR. SPEEGLE: If this had been done correctly the first time instead of messing with it for over a year, I wouldn't be asking these safety questions.

But now in my mind, and a lot of other people's mind, this went on so long what other issues were not done correctly in this plant?

MR. PALLA: Perhaps that calls in the question whether the plant is being operated in accordance with its design basis.

As Andy Kugler described earlier, there's a parallel review of the safety analysis. This is really - if it belong there, it would be on the safety side. But this is really an operational issue. This isn't really a license renewal issue. I think it's something we would not be dealing with today.

MR. CAMERON: In other words, it is an operational issue. These types of operational issues are something that the NRC watches for and is very concerned about. It is not the subject of the severe accident mitigation alternatives.

And in just general terms, if there is something that needs to be corrected at a plant to make conform to NRC's safety regulation, the licensee is responsible for fixing that, and there's no cost-benefit valuation of whether they are going to do it or not.

And I know we are going to hear from you, Mr. Speegle, in a few minutes more on this, so we'll be back to you.

Yes, sir.

MR. BOSWIN: Sort of the same question I asked earlier. As you guys have gone through your relicensing at other facilities, and you've gone through the SAMA process, in the 20 or so that have been relicensed already are you finding that the SAMA review has found situations where there are actual cost benefits, or are you tending to run the same direction here as well that's --

MR. PALLA: We found them in probably about half. I don't have an exact number, but I think its roughly about half of the plants you'll find something. They tend to be relatively low cost modification, procedural changes for the most part.

The residual level of risk at these operating plants is sufficiently low that when you go through the regulatory analysis guidance, in effect it dictates the amount of money that one could justify spending. That number is fairly low. And we tend to find procedural enhancements.

We did for Browns Ferry found a few that came close in this screening process that we did. But when they were looked at closer, either the costs were recognized to be higher than they were originally estimated or the benefits were lower, so they fell away. So in the end we didn't find any that were cost-beneficial at Browns Ferry.

MR. CAMERON: Do you have a quick followup?

MR BOSWIN: Very quickly.

The list that you generated that you run through each time at each facility, if you finding that it would work perfectly in your model, and it would be cheaper maybe in your model than, in fact, it might be. Even then, generally speaking, it is applicable. Does that raise questions about the model at all that maybe there ends on a Volkswagen.

I guess I'm wondering where it was generated from if you're finding very little applicability across the board.

Appendix A

MR. PALLA: If you'll look at our report -- there's a long list at the beginning. There's 135 potential SAMAs. This comes from a combination of SAMAs that have been identified in previous studies as well as plant-specific improvements that derive directly from the plant-specific PRA. So it's a combination of those.

And, then, they are basically screened through a number of different criteria.

Some of those improvements could relate to pressurized water reactors and are not applicable to a boiling water reactor, so those are easily dismissed. And, then, some of the other ones could be from another BWR that it may have had more value at one plant than another because certain accidents may be more likely at some plants than others.

The risk profile is the makeup of all the various accidents that contribute to core damage, and that profile is somewhat different from plant to plant. So that will impact whether a SAMA's beneficial at one plant and why it might not be at another.

MR. CAMERON: I think what Bob is saying is that there's not necessarily a model; that there is going to be a plant-specific SAMA done at each plant, and each plant is unique. Is that right?

MR. PALLA: That's right. I mean we don't expect that because an improvement was cost-beneficial at one plant. But we don't expect it would necessarily be at the next unit. But we have been asking licensees to address that.

When we've found them in previous reviews, we've asked them to explore them further to be sure that nothing falls through the crack.

MR. CAMERON: Give us your name.

MR. BOSWIN: It's Brian Boswin; I'm with the Huntsville Times.

MR. CAMERON: Thank you, Brian.

Ann Harris and, then, I think we have to move on to the final summary by Mike, and, then, get you all up there to listen to your more formal comments.

Ann.

MS. HARRIS: I've got four short questions that will take four short answers.

MR. CAMERON: We'll do them one at a time, then.

MS. HARRIS: Have you looked at any issues surrounding the shroud on Unit 1? Or have TVA?

MR. PALLA: Quick answer is, as part of SAMA evaluation we did not. This is another one of those operational issues.

A-1 MS. HARRIS: Since this unit is not operating, I find it remarkable that you base these decisions on operations when they aren't operating.

MR. CAMERON: Is that a question?

MS. HARRIS: That's a comment.

Did TVA test for embrittlement on the reactor in the reactor building that's been sitting for over 18 years?

MR. PALLA: Maybe one of the guys on the safety side could answer that because --

MR. CAMERON: In other words, that's not part of the SAMA.

MR. PALLA: That's right.

MR. CAMERON: P.T.? This is P.T. Kuo.

MR. KUO: As Chip says, my name is P.T. Kuo. On the safety side we review those type of things. We look at their reactor vessel, beltline level. We look at how the TVA people manage it, or inspect it.

This is being handled on the part of review. Like Dr. Masnik is talking about there's two power reviews. One power review is the safety side. And we have experts reviewing all those questions that you just raised.

MR. CAMERON: Thank you Dr. Kuo for that.

And Ram, did you have something you wanted to add to Dr. Kuo's.

MR. SUBBARATNAM: My name is Ram Subbaratnam, the Safety PM.

Safety is not a progress as fast like the environmental side. In the process of making the evaluation, we got the data, information from the licensee. We will be making a determination on that question in the future.

MR. CAMERON: So we are looking at it, then.

MR. SUBBARATNAM: Yes.



Appendix A

MR. CAMERON: Did you have a couple of others here?

MS. HARRIS: One other.

MR. CAMERON: One other.

MS. HARRIS: I'm sorry, two.

If you burn the cooling towers down again, how will you cool down; and have you looked at that problem as if it should happen again because we do know that it does happen?

MR. CAMERON: Part of the SAMA analysis?

MR. PALLA: No.

MS. HARRIS: Why not?

MR. PALLA: Well, it --

MS. HARRIS: It is that --

MR. CAMERON: Wait a minute, Ann. Let's make sure we get all of this on the record.

It is not part of the SAMA analysis. The question is, why not? Bob, do you want to clarify?

It's not as if an issue isn't looked at but it may not be looked at as part of the SAMA analysis.

MR. PALLA: What we tend to do in the SAMA analysis is focus on things that are recognized to be important contributors to risk. And this type of event is not identified in the risk assessment.

MS. HARRIS: (Inaudible)

MR. PALLA: Well, it has to be a credible event. These things are assigned probabilities, and I don't know what the probability of the event is that you're speaking of.

I could say that it is not -- it's showing itself as a dominant contributor to risk.

MR. CAMERON: Regardless of whether people like the answer or not, the answer is, it's not a dominant contributor to risk. I just want to make sure that people know that.

MR. MASNIK: Mike Masnik.

But you have to understand that the cooling towers are not necessary for the cool down of the facility. The ultimate heat sink for the facility is the river.

So if another cooling tower burned down, as one has in the past, it is not a vital system from the standpoint of the facility.

MR. CAMERON: One more question and, then, we'll go to you.

MS. HARRIS: How much input -- and what was the level of input -- where you looked at how much human error contributed to SAMA?

MR. PALLA: Well, human errors are important in the risk assessment. The way that this process is done, the probabilistic safety assessment would identify the important human actions. And, then, we use what is called "importance analyses," which is kind of a mathematical sensitivity study that shows how much risk could be increased or decreased if certain basic events in the model were either always perfect or always failed.

So what we tend to do with this model, the Probabilistic model is identify areas for improvements, and areas also for performance, if degraded, would cause a problem.

What we would tend to find is areas that an error that was important in the risk profile could be reduced through a procedural enhancement.

So when we find procedural changes as potential SAMAs, it general is because there was a human error that was important to risk that could be further reduced.

So our process tends to identify those human errors that are important, and, then, we look to ways that those human actions could be reduced.

That's what this analysis does, it looks for further reductions.

MR. CAMERON: All right. Thank you.

Yes, ma'am.

MS. HILL: I'm Brenda Hill and I am so confused. I do not understand. You have a model that is developed that you use to do a mathematical equation on; is that correct?

MR. PALLA: Yeah.

Our model is a representative of --

MS. HILL: Wait a minute. Give me a minute. Don't confuse me any more, okay.

## Appendix A

You have a mathematical equation that takes in to account human error as well as physiological organic changes, and the buildings are falling down type stuff, and you put this in a mathematical equation.

MR. PALLA: We don't have buildings falling down. What we have is combination of events that have to occur simultaneously.

MS. HILL: Yeah, but you do have things happening to the buildings. I mean any time you have -- this building eventually is going to fall down, right?

MR. PALLA: No, we don't think the building is going to fall down. We can have someone from the safety side explain why not.

MS. HILL: Eventually, at some point in time, this building we're in right now will fall down. Yes or no.

MR. PALLA: Well, some day.

MS. HILL: Yes or no. At some point in time this building --

MR. PALLA: Sure.

MS. HILL: Okay.

MR. PALLA: We're talking a 20-year license renewal, and we're assuring that it won't happen in 20 years.

MS. HILL: You are taking mathematical equations and using them to establish whether or not this place is safe and, as part of a mathematical equation, you are taking in to account human beings who are prone to error, and you're telling me that your nuclear plants are going to be safer.

MR. CAMERON: One assumption, Brenda, that you need to remember about this whole SAMA analysis is that this is done to identify additional things to make it safer. It's not addressing, as Bob said before, whether the plant is safe. The assumption that it is safe and they put this analysis on top of it.

MS. HILL: Okay. Can you explain a little more to me about where did your model come from? What is it? I've heard of Chernobyl, I've heard of Three Mile Island, and all these others. Are those type of things taken in to account when you're doing this?

MR. PALLA: Yes, they are.

What the model is, is a recognition of physically what is in place to protect the core. So the basic function is core cooling, let's say, for the reactor. There are numerous pumps that can be used: high-pressure pumps, low-pressure pumps. Perhaps any of which would succeed.

In order to melt the core, you have to fail high pressure, you have to fail a depressurization function because you have low-pressure pumps as well. So if your high-pressure pumps fail, you can depressurize and use the low-pressure pumps.

You know, you could have an operator error, failure to depressurize, in which case, even if you had low-pressure pumps, they're of no use to you if you're at high-pressure.

But this model will look at the pumps that you have, the number of pumps. There is statistical information that describes the probability that the pump, even though it's there and thought to be operable, might not work. And if you have three pumps, then you have to have the probability that Pump A, Pump B, and Pump C don't work.

And, then, if you are looking at the low-pressure pumps, you have to have a failure to depressurize as part of that; and, then, you'd have to have failure of the low-pressure pumps.

So what the model does is look at all of the ways the core could be kept cool. And what it tells you is, these are the different combinations of things that would have to happen for the core to be damaged.

At Three Mile Island, for example, the operators had some mechanical problems, and, then, there could be some human errors in there, too.

This is part of the model is, the important human actions are modeled in the probability that those are not successful.

MR. CAMERON: If there's any further explanation that we could give Brenda after the meeting to maybe explain what exactly you mean by a model and how this works may be helpful.

MS. HILL: Well, you can explain it to me.

MR. CAMERON: Michael, do you want to sum up and, then, we're going to go out to people in the audience.

[Presentation by Michael Masnik]

MR. CAMERON: Thank you, Mike.

Now, we are going to hear from you. One thing we find useful in some cases is to have a representative of the license applicant make a few remarks about what their rationale and vision

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is in terms of license renewal. So we have Mr. Chuck Wilson, who is the Project Manager for the Environmental Review on license renewal from TVA.

Why don't you go up there, and will try and figure out what is causing this interference.

MR. WILSON: Thanks, Chip.

I'm Chuck Wilson. I'm the License Renewal Environmental Project Manager for TVA. I've got just a couple of very brief comments.

Next slide.

First, I want to say that a number of TVA reviewers are looking at this Draft Environmental Impact Statement, and TVA will be providing comments before the comment period closes, March 2nd.

B-1 I can also say that TVA agrees with NRC's overall conclusion that the environmental impacts of Browns Ferry License Renewal are minimal.

Next slide.

B-2 Also, I wanted to say, very briefly, being a Federal agency, in the spring of 2002 TVA prepared its own environmental impact statement addressing Browns Ferry License Renewal, and Browns Ferry Unit 1 restart. There were no significant environmental impacts, and license renewal was found to allow power production without green house gases, which is consistent with TVA's clean air initiatives. It also maximizes use of existing assets and avoids the impacts of new site construction.

So, our overall conclusion at that time that it was an environmentally sound thing to do.

Thanks. That's all the comments I have.

MR. CAMERON: Thank you very much, Mr. Wilson.

I was going to go to Ann Harris next. Ann, do you want to stretch out a little bit?

MS. HARRIS: Yes.

MR. CAMERON: Let's next go to Mr. Speegle and, then, we'll go to Julie Leg. and, then, Dawn Knox after that. Eventually, we'll get to Ann Harris and the rest of you.

Mr. Speegle.

MR. SPEEGLE: First of all, I'd like to say thank you all for letting us have this opportunity to get our concerns on paper.

My name is James Speegle. I was a painter at Browns Ferry Nuclear Plant and a Foreman inside the torus for the better part of over a year.

C-1 The things that I witnesses inside the torus, they're scary. But you guys didn't get a chance to see that because the mess was mopped up, okay.

C-2 I don't blame TVA for this. I blame the contractor. Okay. TVA is doing the best they can do to straighten the problems out. I realize that. I'm not here to beat them up. And nobody needs to sit here and think I'm against nuclear power. I'm not. We got to have it. We got to have energy.

C-3 The thing that bothers me the most is when a man from supervision will stand there and tell you: Don't worry about it. They'll pay you come Wednesday. Confusion is money. If they don't like the way we done it this time, it tears me up, we'll do it again, and they'll pay us for it.

These are not people that are worried about safety. These are people that are worried about filling their pocketbooks to where they can go back home, stay there, and live comfortably, and let us have to deal with the problems they caused at this plant.

Is there ever going to be a problem? Who knows. They didn't think there would be one at Chernobyl either.

C-4 Eighty-two percent of the kids born in Chernobyl over where Chernobyl is at in Russia, is born with birth defects. Eighty-two percent. And some of it could have been prevented. Maybe some of this can be prevented up here. This is definitely a safety issue that needs to be addressed.

I do know that NRC is looking into some of this stuff.

C-5 The gentleman onsite that conducted all this stuff has made the comments in the last two weeks that he has been cleared of all charges. I haven't even gotten a report from NRC yet saying what the results were. He's saying NRC is telling him this.

It makes me, and other people, think that NRC is helping cover things up. I don't look at it that way. I hate to. But this gentleman on site is a safety issue himself. Okay.

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C-6 | That whole contracting company up there filed bankruptcy years ago. They're using this, at the cost of safety to everyone in this community, to regain what they lost years ago. That's not our fault. That's bad management.

TVA may or may not want to look into this of you getting another contractor.

Obviously, I was right about the things I complained out, or Williams Power would never have been brought in to redo what Stone and Webster worked on for almost a year.

C-7 | The plant itself has got to have a cooling system that works.

The paint chip -- people say well, painting. Painting don't really matter. Painting does matter. Ask Davis Bessie Plant. Some of you guys probably already know that they had to redo a lot of their painting in their systems too.

C-8, C-9 | Browns Ferry Unit 2 and 3 run efficient. They run clean; they run good. I worked on Unit 3. Nothing in Unit 1 has been done the way Unit 3 was revamped and redone back in the early 90s. Nothing. Everything has changed differently. The torus was redone right.

C-10 | This torus started out -- and I do believe it was financial gain, and they throwed safety out the window to get there.

We had a man to get internally contaminated in there by these people, by instructing him to do the things the wrong way.

I stopped two other gentlemen from doing the job. They stuck him in. He done it the way they wanted; he got internally contaminated. He has yet to get a report from NRC as to why these people didn't get disciplined for sending him in there like that. Why?

I mean did the report not be sent to NRC, or is it just not been finished yet to get back with him. It was over eight or nine -- well, close to a year now that he was internally contaminated under instructions by people that are still in that plant doing things in this manner.

C-11 | Like I said, I don't blame TVA for this. I blame the contractor. But ultimately, somebody has got to clean house. And I think somebody needs to start cleaning house pretty soon before we have major problems that we can't correct.

C-12 | It's a shame to have to stand here and look like I'm degrading somebody because they fired me. That's not what I'm here for.

I was paid \$1200 a week; I went down to \$210 and it took eight weeks to get that. I was financially hurt from this. That wasn't what I done it for. I could have kept my mouth shut and went on. I didn't. I did this for the community and for the fact that I know that was being done

wrong up there. And like I said, if I was wrong about what I complained about, they never would have spent those many millions of dollars to have it redone.

C-13 So I would like to ask you all today if you all would please find out who instructed it to be redone as far as the inside of that torus. Who come up with the initiative to say, hey, maybe there is a problem. Let's stop back and find out what we got to do.

All they had to do was listen to the people inside the plant that knew what to do to begin with, and that was to sandblast it from water line to water line and the problem never would have occurred.

C-14 We skipped around over rust. And every time we would ask why are we missing this spot and doing this one? Our answers we got back were "They'll pay us to do it on another contract."

Well, that's wrong. That is greed. And they threw safety out the window for greed.

If anybody in here feels I'm wrong about that, please, give me a comment right now. I need to know. Am I thinking the wrong thing when I'm worried about this plant shutting down and not being able to cool down because the torus is being done wrong?

Now I know it is done right.

C-15 Thank you TVA for making sure this thing is done right. I really appreciate that. I think you all had a big part in the overall redo of this torus.

But I spoke up, exactly what your open-door policies tells me to do. And it says there's no reprisals towards anyone for speaking up. Well, I got reprimed against me. They run me off. Cost me my livelihood.

I can't hardly work anywhere anymore. I can't get a job paying anything near what I was making up there. And it's not because I'm not skilled, it's because I got tired of looking at what was going on.

I'm asking you to eliminate the problem. Eliminate the problem and get this thing back on track.

C-16 You said you made milestones and everything was in line, maybe so. It might have been met. But I was in that torus and two milestones were missed.

Now that might have been Stone and Webster's milestones; it might have been TVA's milestones. But they were missed. Because every time we go to the point of finishing up, they would come and say, hey, we're not going to make it. And when they would talk about milestones, everybody knows here they're talking about money, their bonuses.



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Cut the bonuses out. Make them do it right. If the job ain't right, don't pay them.

I think Stone and Webster ought to have to reimburse TVA for the redo that Williams Power put out, and the money that was spent towards them. Stone and Webster ought to be accountable for that money.

I mean, would that not be a fair assumption? If somebody pays me to do something for them, and I don't do it right, and somebody has to redo it, I should be the one forking the bill over.

I just think that TVA took a rough beating on this thing too, but I took it too.

C-17 I don't know how to stress to you the importance of how it is to get this situation under control, because the same people that done this in the torus are the same people still up there running things in that plant. Everything from the lead, everything from the non-lead that was treated like lead, and then created so much toxic chemicals that, ultimately, TVA has got to pay to have it buried or put some where.

I mean why do you want to create waste when it didn't have to be created. They made money on it.

They claim 150 and 60 spots of lead removal a day. We couldn't do 20. With the crew we had, I promise you, we couldn't do 20.

It is pitiful to sit here and know all this went on and you can't get any answers from anybody.

I asked some questions earlier and they said, well, upper management is looking at it and everything. And I appreciate that, but I need some answers.

C-18 I have trouble sitting around at night thinking what's going on at that plant. And this is not because I was fired. Like I said, I could have kept my mouth shut and made my \$1200 a week and took my family on vacations. I didn't do that. I didn't do that. I stood up for what this paper right here tells me what I should and could do. And I got fired for it. And it is because people threw safety out the door and wanted to get their pockets full of money. And that's basically all it came down to.

And I'm asking you guys to keep an eye on the safety. I can't stress it enough. It needs to be looked at.

There's a book *Corrosion Prevention by Protective Coatings* by Charles G. Monger. This book tells you everything you need to know. Everything in this book was done inside that torus. It even gives you the attitude of the people that run the job in that torus.

I got several copies of it. I would like to speak to TVA, NRC before I leave here today and give some of these copies to you all and let you all sit and read them and see what I'm referring to. It's textbook stuff. All they had to do was go by the book.

They threw the book out and grabbed the money, and safety was an issue that really got thrown out.

Thank you very much.

MR. CAMERON: Thank you, Mr. Speegle, for taking the time to come down to talk to us, too.

Ann Harris, are you ready now?

MS. HARRIS: Yes.

MR. CAMERON: This is Ann Harris. Ann is with the Sierra Club.

MS. HARRIS: My name is Ann Harris, and I represent the State of Franklin Group of the Tennessee Chapter of the Sierra Club.

A-2 I am here today because I find that the NRC staff does not have a law that they will stop at to bend over for the nuclear industry.

A-3 In this place several months ago, Chip, you and the Region II boys and the Rockville staffers all went to great length to assure me that, if the NRC knew that the untried fuel process from the Erwin, Tennessee plant of Nuclear Fuel Services, using France's Framatome process, would be a part of the EIS, when completed.

Now that was to be the fuel that was to be used here at this plant for those of you here who don't know.

NRC would make that part of the EIS.

You quickly stated that I didn't need to worry. Boys, I'm worried.

A-4 I can't determine if the NRC staff is the world's largest group of paid snake oil salesmen or just totally incompetent. Maybe you can't read or understand the English language. I don't know. Maybe you don't know how to spell Framatome. Maybe you don't know how to spell NFS. How about if I give you some more clues?

A-5 In a letter dated August 27, 2003, addressed to the Director of the Office of Nuclear Material and Safeguards, which is at the NRC, Framatome began the letter and wrote, and I quote.

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"As discussed with Mr. Peter Lee of the Fuel Cycle Facilities Branch and various other NRC staff members during a meeting with FANP representatives at your headquarters on July 21, 2003, FANP is planning facility modifications at its Richland, Washington facility to support the processing of Blended Low Enriched Uranium (BLEU)..." And I'm not sure what this is. It says ..." UO2 powder for use in the fabrication of TVA's BW fuel bundles."

The letter is signed by D. W. Parker, Manager, Environmental Health, Safety and Licensing. It is on Framatome letterhead. How can you ignore this information in this EIS?

So you'll know, TVA has only one nuclear boiling water reactor site, Browns Ferry.

A-6 That is the same site referred to in the letter referenced above. And I find it remarkable that  
A-7 you still don't want to save the rate payers the cost of another hearing and put the analysis in  
the EIS. I understand that TVA has plenty of money. And yeah, I understand you boys are not  
concerned about money since your salaries will be paid regardless of whatever remarkably bad  
decision you produce.

A-8 Also, I did notice that you forgot to get the language correct in the transcript copy I received by  
mail concerning the NFS and Framatome fuel issue. I have a copy here so you will know where  
to look. This copy came out of your document room in Rockville, prior to your last meeting with  
me here in this room, and was retrieved down here, in Tennessee, by computer, late one night  
when I had nothing to do.

A-9 And I pay particular attention to the so-called "official record" of the last meeting we had down  
here. Where you erased the part about how you would address the fuel issue that I questioned  
you on if you had the knowledge. Boys, it is time that you found new dictionaries and begin to  
read.

A-10 I have recently taught adults at the junior college level and I cannot imagine having one of your  
written decisions given to me to grade. Let me tell you, you have failed my classes, since I  
have put forth a decision for class work on how not to do research and what failures you are on  
ethics, language and your responsibilities as government employees.

A-11 Somehow I will find a way to ask my U.S. Congressman to retrieve your salaries because of  
malfeasance in office. For the uneducated, it means intentional wrong doing. How you deny  
your incompetence and continual actions that promote you as a laughing stock of the entire  
US? Are you so incompetent that you can't find jobs elsewhere rather than become snake oil  
salesmen? I'm amazed.

A-12 I give you further examples of your continued malfeasance. TVA obtained its first license for  
building nuke plants for this very plant in the last century, during the sixties. For those of you  
who are not old enough to know. That was over forty years ago.

In the seventies, you were advised and carried a load of embarrassment into congressional hearings during the eighties about the abuse of employees by TVA management in direct violation of federal law.

Now here we are today with the same boiler plate statement that TVA does not condone abuse over public health and safety.

A-13 When you look at Mr. James Speegle, here, how do you look him in the eye and tell him that you, the NRC, cannot stop the abuse because you refuse to do what is required to stop the abuse of those such as Mr. Speegle that feel that Public Health and Safety is important and refuse to take the abuse from TVA managers over safety problems?

A-14 In 1993, when I found the infamous Memorandum of Understanding between TVA and NRC stating that the NRC would turn over to TVA management names of those raising safety issues to the NRC, I was embarrassed for you guys. And here we all are 12 years later and the practice in that agreement is still being carried out. Don't correct me.

I know you canceled the MOU, but you forgot to stop the practice. Do you boys here today know that TVA's record at the Department of Labor is the largest in the nation? And did you know that you have never been able to stop that abuse because of your refusal to do your job?

A-15 All the time and words in the world will never heal the continued incompetent of the NRC staff and commission. Your continued refusal to perform your jobs is a clear indicator that the NRC will continue to put public health and safety below industry financial report. The time will soon come when your actions will come to hit you in the seat of the pants as you leave a nuclear site.

I ask that you rethink your position on drafting up an EIS that permits TVA to burn nuclear weapons materials in this reactor.

A-16 I ask that you look at your obligations as public employees and see the wrong in such a decision as permitting this plant to go forward without the analysis for the type of fuel that TVA will burn here.

A-17 And least you forget, I remind you of the recent 32-ton crane trolley that was dropped between the reactor buildings. And what is worse, you cannot determine if the accident -- excuse me, unplanned event -- is a safety issue. And you want the public to trust you.

A-18 In my 21 years of dealing with you boys I still cannot trust you with public health and safety. How sad you are.

By signed copy of this letter, I formally request that this statement be a part of the official record of these proceedings.

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MR. CAMERON: Obviously, we need to go back and -- pardon me?

MS. HARRIS: I expect some answers.

MR. CAMERON: We need to go back and look at what we said about analyzing this particular type of fuel. And if we can shed any light on that before the meeting is over, we'll do that. That is a comment to look at that, and we receive it as such.

Dawn or Julie, either one of you prefer to go first?

(Inaudible)

Do one of you want to come up right now? Dawn Knox.

MS. KNOX: Hi, my name is Dawn Knox. I am a citizen of Madison County, Alabama. I'm 24 years old.

I heard about this Nuclear Regulatory Commission Meeting in the Huntsville Times. I felt like it is my duty, as a citizen, to come up here and contribute what I have to contribute.

I've done a little bit of studying and I do have several questions that I would like to be answered.

D-1 But my main concern is, I found out that 15 percent of the energy that is derived from the 375 nuclear power stations in the United States that six are on a critical list, and one of them happens to be Browns Ferry Nuclear Power Plant. Or was as of 1988. And that was my concern and still is my main issue.

I do have several questions about that also. What is the Nuclear Regulatory Commission doing to reduce the factors that makes Browns Ferry Nuclear Power Plant one of these ones that is or was on the critical list as of 1988?

D-2 And during relicensing are there any top priority issues in the maintenance and infrastructure of any of the nuclear power plants? Specifically, Browns Ferry Nuclear Power Plant in Limestone County, Alabama; Sequoyah Nuclear Power Plant, Dekalb and Jackson County; and Joseph M. Farley Nuclear Power Plant of Houston and Henry County. And if so, are any of them manufactured issues waiting to a transition over to a newer, better, more advanced technology.

D-3 Are we moving over to a more efficient form of energy?

I have several questions. I would like to get with a few of you afterwards, if that is okay.

Thank you.

MR. CAMERON: We will be happy get with you on the issues that you raised as well as any other questions that you have right after the meeting, and take as long as we need to do that.

Julie?

MS. LEG: I'll submit my questions and comments in writing.

MR. CAMERON: Okay. I'm sorry if I misunderstood. And if you have questions you want to talk to the staff about, please feel free to do so.

We heard from Mr. Horn earlier, and I believe he wants to make a comment now.

E-1

MR. HORN: This is Stewart Horn. I provided comments at the Environmental Scoping Meeting for Browns Ferry held in Athens last April. At that time I raised concern about the safety of the containment structures for the three units as a result of the containment vessels being thermally shocked through repeated automatic shutdowns of the reactor units. I had previously raised this issue with TVA when it requested public comment concerning extending the life of the three reactors in 2001. I received no response from TVA concerning my comments.

E-2

As many people don't remember, and TVA never advertises, TVA had such a horrible operating record in the initial 10 years of operation (1975 to 1985), that all three reactions were shut down in 1985 reportedly due to safety concerns and repeated safety violations.

E-3

It took six years to reopen Unit 2 and ten years to reopen Unit 3. Unit 1, in which the near disastrous fire occurred, never reopened and has been mothballed for almost 20 years. During the ten years of initial operation, TVA was plagued by an amazingly large number of reportable occurrences. I went to the Athens Library during this time and reviewed some of the statistics in the Browns Ferry operating records which, at that time, were maintained in the library.

Over a period of less than four months in the fall of 1980, there were 66 reportable occurrences at the three units or more than one every two days at Browns Ferry facility. These events were fairly evenly distributed among all three reactors (Unit 1 had 23, Unit 2 had 21, and Unit 3 had 22).

If operation during the above time period was typical of Browns Ferry operation over the first ten years, then more than two thousand reportable occurrences would have occurred at Browns Ferry in the first ten years of operation. I couldn't determine at the time how many of the reportable occurrences had resulted in SCRAMS or automatic shutdowns of the nuclear reactor, but my understanding at the time was that automatic shutdowns often occurred.

During the 80s, I read a lot about nuclear power generation. I learned that when an abnormal event triggers an automatic shutdown, it is somewhat of an emergency process. This process

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is designed to shut down the reactor much more rapidly than when the reaction is shut down using normal operating procedures. The faster than normal cooling of the reactor containment structure thermally shocks the structure resulting in great stresses throughout the structure with the disturbing potential of weakening it. Reportedly, this could result in premature aging of the containment structure.

- E-4 After the meeting last April, I went to the Athens Library to try to determine how many automatic shutdowns had occurred at Browns Ferry. The historical NRC Browns Ferry files are no longer there. I called NRC. They told me that the information would be available through the online NRC public documentation system. I struggled to try to find the data online, but eventually gave up after suffering severe frustration. I then called NRC and requested that someone there find the data for me, but I never received any information.
- E-5 The only response I received from the NRC relative to my comments was that the issue I raised was a safety issue and would be part of the safety review and not part of the environmental review. I was told that the safety review meetings would be conducted in Washington, and I was not able to attend these. Hopefully, this issue was dealt with during the safety review, and there is someone at today's meeting that can discuss this and explain the results of the safety review and how the above concerns have been resolved.
- E-6
- E-7 What has the NRC done to assure and how does the NRC know that the reactor containment vessels at the facility are structurally sound and capable of safe operation for 20 years beyond their "designed to" life?
- E-8 Before approval is granted by the NRC to extend reactor life by fifty percent, at least the following should be done as a minimum:
- TVA should report the total number of automatic shutdowns that have occurred at each Browns Ferry reactor during its operation.
- The NRC should investigate (and report to the public about) the reportable occurrences, automatic shutdowns, or other safety violations which have occurred at each reactor including the significance of these events relative to the safe operating lifetime of the reactors.
- E-9 If there is any possibility of premature aging of any of the containment vessels as discussed above, TVA should be required to determine by scientific measurement the structural soundness of each reactor containment vessel using non-invasive techniques or whatever method is available. If these techniques do not exist, TVA should be required (before license approval) to develop the techniques and undertake the testing and analysis to determine and be able to assure the local public and the NRC that there is no danger of containment vessel failure.
- E-10 I believe that there have been a significant number of automatic shutdowns of the three Browns Ferry reactors. If that is the case, and if what I read about the effects of these events is true,

this of major concern to anyone living in this area or downwind. There is the possibility that one or more of the Browns Ferry containment vessel structures have been weakened and prematurely aged. This could pose a serious threat for the people of the Tennessee Valley, especially considering that the TVA and NRC are in the process of extending the operation of all three reactors fifty percent beyond their "designed to" operational life.

E-11

I have another question for the NRC regarding relicensing approval of the mothballed Unit 1 reactor. Have you already renewed the operating license of this reactor, or have you informed TVA that approval of license renewal is guaranteed? The TVA has spent \$885,000,000 on this project, and it is beyond belief that they would have done such a thing if there may be the remotest possibility that approval might not be forthcoming. If approval has not already been granted or is not guaranteed, has the NRC encouraged the TVA to initiate work on this project under these circumstances?

Thank you for your time and attention. I appreciate the process that includes and encourages the public to comment.

MR. CAMERON: Thanks, Mr. Horn, and our safety people are going to talk to you about this. Thank you.

Mr. Timberlake.

MR. TIMBERLAKE: Good evening, ladies and gentlemen, members of this distinguished and illustrious country, to those that we have entrusted our lives to.

F-1

It is with great sadness that I stand before you hearing such appalling reports that our citizens have laid against you, right or wrong. However, TVA, I know is an agency that has a very thick skin. No matter how much you tell them the truth, they seem to find ways to spin it differently.

Having said that, I am Ralph Timberlake from -- I reside in Huntsville, Alabama, and I live downwind from this one reactor, which is Browns Ferry, and I got the other one on the other end of me, Bellefonte. I understand it is fixing to crawl back on line.

F-2, F-3

I'm a proponent being against nuclear power. I think the cost-benefit analysis has not shown itself to be worthwhile.

As someone alluded to earlier about the Chernobyl factor and the Three Mile Island, we have not successfully cleaned up those areas. Those areas have been lost to our grandchildren and generations past them. It is something for us to consider.

F-5

Nuclear power, though we should not be afraid, is not something that we can control. We do not fully understand it. We're talking about 20,000 years before it is fully decayed and, then, we



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don't know if it is going to be safe. It is all speculation. Unless someone here lives longer than some of the Pharaohs that we are finding mummies of these days.

F-6 I would like to say that given the fact that information is very difficult to obtain through the bureaucracy that this license renewal should be withheld. I do not think that the track record of TVA warrants us a renewal, based on not unequivocal answers.

F-7 The people who presented their case today kept saying, well, this doesn't apply this; this doesn't apply to that. It's not a matter of what it applies, because if I get some of that nuclear radiation in me, I cannot get it out. It will affect me and my children and all the way down the line.

As you well know, TVA got in trouble with polluting the water, and I think someone make something about how are you going to cool this reactors down. By the river.

F-8 But if I remember a little bit of the information I read at one time, if you raise the water temperature in the water, in the rivers and other stream, it can have an impact, a severe and negative impact upon the wildlife that deals with this water, and the fishery and all the other animals and mammals that is within that water. How far down stream that's going to affect, no one took the time to deal with.

F-9 Hopefully, the pristine area that we reside in here will be maintained. Though we are in an agrarian area, per se, except for probably Redstone, we would like to retain that. We would like to believe that we are going to have these pristine trees, we're going to have viable fisheries and other means of transportation to which these two reactor -- this reactor which you are talking about today could have a severe impact and, then, we are going to be back discussing probably again Bellefonte, if that's going to have an impact.

F-10 If we can somehow restore the public trust in our officials, if we cannot trust our officials, which seems from the comment earlier, we cannot, something needs to be done.

I would entreat you to take the time, those that are in authority and those that are receiving our trust and our funds from our taxes, would take time to try to restore public competence and trust in you.

If we don't trust you, it is going to be a problem. And, then, surely reprisals should be a horror to all of us sitting here. If the people, which we are a people-driven government, let us understand that -- you cannot be everywhere at one time. If the eyes and ears of those that are willing to put their families and lives on the line are not rewarded, is not appreciated, we do ourselves and our posterity a great and horrendous disservice.

So I beg you, beseech you that you some how take time to look at this matters and do not be afraid for the sake of money 'cause no amount of money is worth their life of one single person.

F-11

And I would like to leave you with one saying, *Pax vobiscum*. That means peace go with you. We need peace in this valley, and that nuclear plant out there is not only a target for everything else, it is the source of contention right now.

I again thank you for taking the time, and I really appreciate the service you try to do. Just work with us and we'll try to work with you all.

Thank you.

MR. CAMERON: Thank you, Mr. Timberlake.

Hopefully, our analysis in the Final Environmental Impact Statement is going to be credible. You will be able to see what decisions we are making, and why. The NRC staff is available to answer questions, to talk to people if they have concerns. If there's things that are not understood, if there's something that has been overlooked, we're very open in that regard.

That's the last speaker that we had.

Ann, did you have something else you wish to say?

A-19

MS. HARRIS: Yes. I want to know if your comments that you would address the issue on the fuel is on the record this time.

MR. CAMERON: Yes, it is.

Because we don't have a cordless and because Ann has a little bit of a back problem that prevents her from getting up to that mic, just let me reiterate for the record what she said, which I believe you said: That it was my comment that we would need to look at the transcript from the last meeting and see what we actually did say about that issue. That is on the record.

Now the NRC staff might want to say something in that regard now. I don't know. I think Mike Masnik does. Michael.

MR. MASNIK: Ann, I did go back after the meeting and I did look in to your issue. At first I thought you were talking about MOX, but after a while I realized it was the BLEU fuel. To be honest with you, it took me a week or so to figure out all the ramifications because that review is being handled by our Materials folks, which is a different organization within the Agency.

Anyway, the results of my looking in to it are summarized in the Scoping Summary Report, which I believe was sent to you, which looked at issues, and this issue is outside the scope. Nevertheless, we will address it in the Final Environmental Impact Statement. I'll be sure that we will address the issue.

MR. CAMERON: Thank you, Mike.

## Appendix A

As Mike said, just to summarize because there was important statements made about what the NRC staff did in that regard, is that we did not overlook the issue. We did look at it. We didn't think it was in the scope of license renewal. It doesn't mean it is not an important issue. It means that it is not within the scope of license renewal that's explicitly talked about in the scoping study. We have heard the concern again, and we will look at it again in the context of the Final Environmental Impact Statement.

So I think it is important for people to hear that we did listen to that. We didn't gloss it over. We will look at it again.

Thank you all for being here.

We have another meeting tonight at seven o'clock, open house at six. We welcome all of you to come back and talk to us again, in addition to other people. Tonight, we are going to sit down with any of you who want to discuss issues further.

I know that Julie and Dawn have some questions. Julie raised an issue early on about participating in the hearing. We have our representative from Office of General Counsel here.

I'm going to turn it over to Andy Kugler, who is the Chief of the Environmental Review Section.

We do have something that we call a feedback form, perhaps rightly called the feedback form today, but it is to give us an evaluation of things we could do in terms of these meetings, in terms of notice, whatever, but we welcome your comments. They help us. They are in the back of the room. You don't have to fill them out now. If you want to, that's fine. You can leave them with us, but they already are franked. In other words, you could just put them in the mailbox and we'll get them.

Thank you.

Andy, do you want to --

MR. KUGLER: That was amazing. I did want to mention the Meeting Feedback Forms. We do appreciate getting feedback from you, looking for ways to do things better, to make the meetings more useful for you.

Other than that, I just wanted to thank you for coming to our meeting, for participating with us, and we will stay around after the meeting to talk to you and hopefully be able to answer some of your questions.

Thank you.

(Whereupon, at 4:00 p.m. the session was ended.)

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S ANDERSON

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Stewart Horn  
498 Keel Hollow Rd.  
New Hope, AL 35760  
January 23, 2005

The Nuclear Regulatory Commission  
Washington, D.C.

The following comments are submitted concerning the Draft Supplemental Environmental Impact Statement for License Renewal at Browns Ferry Nuclear Power Plant, Supplement 21.

I provided comments at the Environmental Scoping meeting for Browns Ferry held in Athens last April. At that time I raised concern about the safety of the containment structures for the three units as a result of the containment vessels being thermally shocked through repeated automatic shutdowns of the reactor units. I had previously raised this issue with TVA when it requested public comment concerning extending the life of the three reactors in 2001. I received no response from TVA concerning my comments.

As many people don't remember and TVA never advertises, TVA had such a horrible operating record in the initial 10 years of operation (1975 to 1985), that all three reactors were shut down in 1985 reportedly due to safety concerns and repeated safety violations. It took 6 years to reopen Unit 2 and 10 years to reopen Unit 3. Unit 1, in which the near disastrous fire occurred, never reopened and has been mothballed for almost 20 years. During the 10 years of initial operation, TVA was plagued by an amazingly large number of Reportable Occurrences. I went to the Athens Library during this time and reviewed some of the statistics in the Browns Ferry operating records which, at that time, were maintained in the library. Over a period of less than four months in the fall of 1980, there were 66 Reportable Occurrences at the three units or more than one every two days at the Browns Ferry facility. These events were fairly evenly distributed among all three reactors (Unit 1 had 23, Unit 2 had 21, and Unit 3 had 22). If operation during the above time period was typical of Browns Ferry operation over the first 10 years, then more than 2,000 Reportable Occurrences would have occurred at Browns Ferry in the first 10 years of operation. I couldn't determine at the time how many of the Reportable Occurrences had resulted in SCRAMS or automatic shutdowns of the nuclear reactor, but my understanding at the time was that automatic shutdowns often occurred.

During the 1980s, I read a lot about nuclear power generation. I learned that when an abnormal event triggers an automatic shutdown, it is somewhat of an emergency process. This process is designed to shut down the reactor much more rapidly than when the reactor is shut down using normal operating procedures. The faster than normal cooling of the reactor containment structure thermally shocks the structure resulting in great stresses throughout the structure with the disturbing potential of weakening it. Reportedly, this could result in "premature aging" of the containment structure.

After the meeting last April, I went to the Athens Library to try to determine how many automatic shutdowns had occurred at Browns Ferry. The historical NRC Browns Ferry files are no longer there. NRC told me that the information would be available through the on-line NRC public documentation system. I struggled to try to find the data on-line, but eventually gave up after suffering severe frustration. I then called NRC and requested that someone there find the data for me, but I never received any information.

The only response I received from the NRC relative to my comments was that the issue I raised was a safety issue and would be part of the safety review and not part of the environmental review. I was told that the safety review meetings would be conducted in Washington, and I was not able to attend these. Hopefully, this issue was dealt with during the safety review, and there is someone at today's meeting that can discuss this and explain the results of the safety review and how the above concerns have been resolved.

What has the NRC done to assure and how does the NRC know that the reactor containment vessels at the facility are structurally sound and capable of safe operation for 20 years beyond their "designed to" life?

K-1

K-2

K-3

K-4

K-5

K-6

K-7

K-8

Before approval is granted by the NRC to extend reactor life by 50% at least the following should be done as a minimum:

1. TVA should report the total number of automatic shutdowns that have occurred at each Browns Ferry reactor during its operation.
2. The NRC should investigate (and report to the public about) the Reportable Occurrences, automatic shutdowns, or other safety violations which have occurred at each reactor including the significance of these events relative to the safe operating lifetime of the reactors.
3. If there is any possibility of premature aging of any of the containment vessels as discussed above, TVA should be required to determine by scientific measurement the structural soundness of each reactor containment vessel using non-invasive techniques or whatever method is available. If these techniques do not exist, TVA should be required (before license approval) to develop the techniques and undertake the testing and analysis to determine and be able to assure the local public and the NRC that there is no danger of containment vessel failure.

K-9

K-10


I believe that there have been a significant number of automatic shutdowns of the three Browns Ferry reactors. If that is the case, and if what I read about the effects of these events is true, this is of major concern to anyone living in this area or downwind. There is the possibility that one or more of the Browns Ferry containment vessel structures have been weakened and prematurely aged. This could pose a serious threat for the people of the Tennessee Valley, especially considering that the TVA and the NRC are in the process of extending the operation of all three reactors 50% beyond their "designed to" operational life.

K-11

I have another question for the NRC regarding relicensing approval of the mothballed Unit 1 reactor. Have you already renewed the operating license of this reactor, or have you informed TVA that approval of license renewal is guaranteed? The TVA has already spent \$885,000,000 on this project, and it is beyond belief that they would have done such a thing if there may be the remotest possibility that approval might not be forthcoming. If approval has not already been granted or is not guaranteed, has the NRC encouraged the TVA to initiate work on this project under these circumstances?

Thank you for your time and attention. I appreciate the process that includes and encourages the public to comment.

Sincerely,



Stewart V. Horn

January 25, 2005

Browns Ferry Nuclear Plant  
Athens, AL, Meeting on EIS

My name is Ann Harris. I represent the State of Franklin Group of the Tennessee Chapter of the Sierra Club

I am here today because I find that the NRC staff does not have a low that they will stop at to bend over for the nuclear industry. In this place several months ago, Chip, you and the region II boys, Rockville staffers all went to great lengths to assure me that if the NRC knew that the untried fuel process from the Erwin, TN plant of Nuclear Fuel Services (NFS) using France's Framatome process, the NRC would make that a part of the EIS. You quickly stated that I need not worry. Well boys, I am worried.

I cannot determine if the NRC staff is the world's largest group of paid snake oil salesmen or just totally incompetent. Maybe you cannot read or understand the English language. Maybe you don't know how to spell Framatome, maybe NFS? How about if I give you more clues?

In a letter dated August 27, 2003, addressed to the Director, Office of Nuclear Material Safety and Safeguards, (at the NRC), Framatome began the letter and wrote (quote):

*"As discussed with Mr. Peter Lee of the Fuel Cycle Facilities Branch and various other NRC staff members during a meeting with FANP representatives at your headquarters on July 21, 2003, FANP is planning facility modifications at its Richland, Washington facility to support the processing of Blended Low Enriched Uranium (BLEU) UO<sub>2</sub> powder for use in the fabrication of TVA's BWR fuel bundles." (End quote).*

The letter is signed by D.W. Parker, Manager, Environmental Health, Safety and Licensing. It is on Framatome letterhead. How can you ignore this information in this EIS? So there is no mistake and you will know, TVA has only one nuclear boiling water reactor site. Browns Ferry!

That is the same site referred to in the letter referenced above. And I find it remarkable that you still don't want to save the rate payers the cost of another hearing and put the analysis in the EIS. I know that TVA has plenty of money, and you boys are not concerned about money since your salaries will be paid regardless of whatever remarkably bad decision you produce.

Also I did notice that you forgot to get the language correct in the transcript copy I received by mail concerning the NFS and Framatome fuel issue. I have a copy here so you will know where to look. This copy came out of your document room in Rockville and was retrieved down here, in TN, by computer, late one night when I had nothing to do.

And I did pay particular attention to the so called "official record" of the last meeting we had down here. Where you erased the part about how you would address the fuel issue that I questions you on to determine if you had the knowledge. Boys, it is time that you found new dictionaries and begin to read. I have recently taught adults at the junior college level and I cannot imagine having one of your written decisions given to me to grade. Let me tell you, you have failed my classes, since I have put forth a decision for class work on how not to do research and what failures you are on ethics, language and your responsibilities as government employees.

*Ann Harris  
1/25/05  
NRC  
Athens, AL*

L-1  
L-2  
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Appendix A

**Transcript of the Evening Public Meeting on  
January 25, 2005, Athens, Alabama**

**Evening Session (7:00 to 10:00 p.m.)**

[Introduction by Chip Cameron]  
[Presentation by Andy Kugler]  
[Presentation by Mike Masnik]

MR. CAMERON: You just heard from Andy and Mike about our process. Are there any questions at all about process that we can answer before we go on to the Draft Environmental Impact Statement?

Yes, and please introduce yourself to us.

MS. TIPPER: Jackie Tipper.

The scoping meeting, where was the scoping meeting, and who were the people involved with that?

MR. MASNIK: It was a meeting very similar to this one, in this room. It occurred on April 1st of this year, and we had, I would say, what(?) about 20 members of the public in the afternoon and probably about an equal number in the evening. It was a noticed meeting held in this room.

MS. TIPPER: In this one?

MR. MASNIK: Yes, in this room, on the first of April of this past year.

MR. CAMERON: Mike, maybe to alleviate some of Jackie's concerns, maybe you could just talk a little bit about scoping versus the comment on the Draft Environmental Impact Statement where I think this is probably -- although scoping is important, this is a major event.

MS. TIPPER: Let me ask another question.

MR. CAMERON: Go ahead.

MS. TIPPER: This meeting, Dennis Sherad did an article in the Times Daily. I read the Decatur Daily front and back, except I do not read the classified ads. I saw nothing in the Decatur Daily about this meeting at all.

MR. MASNIK: Well, my understanding --

MS. TIPPER: How are people supposed to, you know, know about this?

MR. MASNIK: Well, we attempt to notify the public in a number of different ways. To answer your question specifically, I believe it was in the classified ads of the Decatur Daily. We had ads in four newspaper: Florence, Huntsville, Athens and Decatur. And my understanding was last -- not this past Sunday but Sunday a week ago there was an article and in that article it happened to mentioned this meeting. That may have been where you had seen it. I believe it was in the Decatur Daily that article was published.



Appendix A

MS. TIPPER: The information I got was from the Times Daily. I didn't find any information from Decatur Daily at all.

MR. MASNIK: Oh, I'm sorry. Okay.

MS. TIPPER: And I called them and asked them why there had been no information, and they had no idea what I was talking about.

MR. MASNIK: Well, we do put out a press release. So there is a press release that's issued. We publish the ads in the papers. Of course, we don't pick all the papers, but we try to get representative papers from each of the communities surrounding the plant. We publish it in the Federal Register. We maintain a website, the NRC website and all the meetings are noticed there. We notified the local governments, and we ask them to announce it at their town council meetings.

I mean we do everything we can, but unfortunately, it is difficult to reach most members of the public. Unless you are interested in following it, it's probably difficult to get the word.

MS. TIPPER: River Neighbors. That is not -- you all aren't publishing that any more. TVA is not.

MR. CAMERON: Just to clarify one thing -- and maybe you don't need to have this clarified for you -- but we all from the Nuclear Regulatory Commission. I don't know what TVA publishes or, if they do publish it, whether there was any mention of this particular meeting in it.

I guess just to reiterate, we're here to try to give you as much information about the draft EIS as possible and, then, there is this subsequent comment period that you have an opportunity to comment.

Even though we do put the notice out at a lot of places, I think we do realize we could probably always do better than we do. So, thank you for that reminder. We won't forget you on the record.

MR. MASNIK: I think we had 15 posters that we put out as well.

MR. CAMERON: Okay, so there were posters around town. Thank you.

MS. TIPPER: Which town?

MR. CAMERON: I'm not sure. Rogersville, Athens, Calhoun College. Well, we're glad you're here.

Other questions on process?

(No response.)

We are going to go to Dr. Sackschewsky to talk about the Draft Environmental Impact Statement.

[Presentation by Michael Sackschewsky]

MR. CAMERON: Thank you very much.

You just heard about the types of information the NRC evaluated, what conclusions were drawn, and alternatives. Is there any questions on this? Anything that Mike can explain in a little bit more detail?

Yes. Nancy, could you just introduce yourself to us, please.

MS. MUSE: I'm Nancy Muse from Florence, Alabama. It is my understanding as an Army brat -- my dad was a career Army -- the Army and the military consider, when they go in to any type of operation, the worse-case scenario. I am wondering if the NRC, in your impact assessments, thought about or considered -- I mean, what you're saying to me sounds great unless it is the worst-case scenario.

In the event of the worst-case scenario, is the impact of the nuclear reactor technology comparable to that of alternative energy technology?

MR. CAMERON: Two issues. One, I think worse case analysis generally but then there's specifically an issue that Nancy brought up about comparing continued operation of the plant versus alternative technology.

MS. MUSE: Well, I mean, if you talk about the impact alternative energy like a windmill would have on birds that hit it, you know, fly into it -- maybe migratory birds -- the worse-case scenario with a nuclear plant, can you compare that on a scale, the same type of scale that you would to the worse scenario using alternative energy sources whether it be solar, the wind, or whatever it may be.

MR. MASNIK: This is Mike Masnik.

The NEPA is the legislation that requires us to do an environmental impact statement. Under NEPA, the case law and the regulation basically has concluded that we don't do a worst-case scenario. In other words, we're not required to look at what would be the environmental impact should the worst possible accident occur at the plant.

Now the plant does -- you know, we evaluate the impact of the plant during normal operation and off normal operation, but not the kinds of accidents I think you are thinking of where we

## Appendix A

would have, for example, a core melt down and a massive release of radiation. So we do not do that. Compare that to the worst-case scenario of the alternatives.

MR. CAMERON: But at least for comparing the alternatives we look at the environment impacts, obviously, from license renewal, and we look at the environmental impacts from the alternatives also.

MR. MASNIK: Essentially, if you have a copy of the document that's Chapter 8 where we look at different alternatives and we look at the impact of those alternatives on the environment.

MR. CAMERON: Before we go back to Nancy, yes, sir.

MR. POSEY: My name is Grant Posey. I'm from Town Creek.

This document that you're referring to, how is that disseminated? How did that get into the public hands? Was that just from the meetings or was it made available at a point where you could go pick it up and review it prior to the meeting? How was that handled?

MR. CAMERON: Michael.

MR. MASNIK: We do a normal distribution of this. Obviously, you are not on the list for normal distribution. But what we did was, during the scoping meeting we had asked for people to sign up. We would have given you a copy when it was available.

Additionally, our web site explains how you could a copy of it as well. So we do make it available. Unfortunately, you didn't get one before the meeting, although we do have a comment period that stretches to March 2nd. So, if after tonight you look at the document and you have some comments, you have a fair amount of time to get back to us with them.

We also put it in the Athens Limestone Library here in town, so it was available there also.

MR. POSEY: Couple of other questions. You are talking about the effluents, the normal release of radiation that occurs with the operation of a nuclear plant. Then, the gentleman spoke about solids. Can you explain to me what solids mean?

And you talked about that they are packaged and shipped or disposed of. Can you explain that to me? And explain environmental justice.

MR. SACKSCHEWSKY: Solid wastes can be a variety of things but, typically, they would be things like rags, tools, anything that's solid that is somewhat contaminated that would need to be disposed of. There are procedures that they would follow for that. It normally would be barreled up some way and shipped off to some licensed landfill that accepts that kind of waste.

Environmental justice came out of an executive order, oh, back in the mid-1990s. Basically, it refers to a requirement for all federal agencies in the NEPA process to evaluate whether a particular project is inordinately affecting a minority or low-income population.

MR. CAMERON: Do you need more information on that or is that enough for now?

MR. POSEY: Is the low grade radioactivity of the solids -- I'm assuming that's very low grade. Its like cleanup rags and tools --

MR. CAMERON: Yes.

MR. POSEY: -- and it's shipped to where? Where are these facilities that --

MR. SACKSCHEWSKY: Solid wastes, we're very concerned about it. A nuclear plant cannot dispose of solid waste unless -- contaminated solid waste unless it is to a licensed burial facility. And these are facilities -- Barnwell is one. There's one out on the west coast. These are facilities that are designed to accept low-level waste and dispose of it in shallow surface landfill situations, which are monitored.

MR. CAMERON: Okay. Let me go over to Nancy and, then, I'll be right back, Jack.

MS. MUSE: The speaker referred to the scientific community having a broad consensus set the amount of radiation released into the environment. Browns Ferry was -- well, I don't know if you said negligible, but it was -- in essence, what I was reading between the lines, nothing to worry about? I want to know what scientific community and who funded the study, and who are the scientists who came to this conclusion.

MR. CAMERON: I think there wasn't exactly -- the statement about the unanimity wasn't referring specifically to Browns Ferry. And Mike, you might want to clarify what you were trying to say there. But, more importantly, can you tell Jackie and the rest of the people what science the NRC -- how does the NRC set its regulations on radiation? I think that gets to who the scientific community is.

MR. KUGLER: I'm not sure I got a full answer because it is not my field.

This is Andy Kugler again.

I know one of the organizations whose information we rely on is the International Committee on Radiation Protection (ICRP). I know there are others. If I had somebody here who has that background, they probably could rattle off the names pretty easily. But they've done independent studies and they've reached conclusions as to what levels of exposure are safe.

## Appendix A

What we're saying is that we've set our limits within those limits and that these plants operate well below those.

We actually have information in the Environmental Impact Statement on the actual, I'm sorry, not the actual but the maximum exposure that anybody could have possibly received from these releases.

What we do is, we do a very conservative calculation. If the person stood by the fence all year and ate things that came from the river right next to the plant, you know, things of that sort, basically, what is the most that a person could possibly get based on these releases. Those numbers are very small. They are much less than our limits. And they are in the Environmental Impact Statement. Are they in Section 2.2.7? I'm not certain of the section. It's in chapter two, I believe, where we give that information.

I think Barry may have a pamphlet or two from the brochures that we brought that may give a little more information.

MR. CAMERON: We also have a recent pamphlet that's written in the context of the project that I think goes into, perhaps, a little detail about how the standards are set by the ICRP, and there's also a NCRP (National Committee on Radiological Protection).

MR. MASNIK: I also have some detailed numbers from the plant, and if you want to speak with me after the meeting, I can share those with you on what the releases were for last year and how that compares to the standards.

MR. CAMERON: Okay. Let's go to Jackie.

MS. TIPPER: I called three different times concerning this meeting to NRC, and I asked -- well, two times I only talked to an answering machine. At one of those times I gave a telephone, two telephone numbers and asked if there was any information on the internet where we could look and find this draft. My call was never returned.

This last time that I called they didn't seem to know anything about this meeting at all. I talked to two different people there at that point in time.

My question is, this study, the time frame, how long does this time frame hold for? Is this for how many years?

MR. MASNIK: This evaluates continued operation of the plant for an additional 20 years at the time the current license expires.

MS. TIPPER: So it doesn't cover anything past the additional time that it is licensed for.

MR. MASNIK: The three units are currently licensed for a period of time up to 2013, 2014, and 2016. What this evaluates is those dates forward for 20 additional years.

MS. TIPPER: So after the plant is no longer in use nothing else is covered.

MR. MASNIK: Well, there are a number of scenarios but probably one reasonable one would be if the plant receives a license renewal -- and let's pick Unit 2 -- at 2014 it would not shut down. Right now under the current license it would have to shut down. It would operate for another 20 years. So that would be 2034. At that time the plant would cease operation and would now enter decommissioning. And there's some requirements for a licensee. For example, five years before the expiration date of the license they have to send in a preliminary decommissioning cost estimate.

Then, what would happen is, after the plant permanently ceased operation in 2034, they would enter decommissioning. We'd have another series of public meetings where the licensee and NRC would discuss the decommissioning process. Typically, that takes probably between eight and ten years addition.

MS. TIPPER: Has that ever happened?

MR. MASNIK: Oh, yes. We've had a number of facilities -- I apologize for the microphone but we can't seem to fix it.

We have a number of facilities that are undergoing decommissioning now. We have the Shoreham Plant, Pathfinder, Fort St. Vrain are three plants that have completely completed the decommissioning process and the license is terminated, and the facility could be used for unrestricted use, which means that you could use it for an industrial facility or, for that matter, for a school.

They would remove the radioactivity to a level where it could be used for unrestricted use, what we call unrestricted use.

MS. TIPPER: You move the radioactive material away from there?

MR. MASNIK: You understand that during the normal operation of the plant you have two things happening: you have contamination, which is radioactive material in places where you don't want it; and, then, you have another process called "activation" where material becomes radioactive if it's near the core.

Both of those things result in solid objects becoming radioactive. And if you remove that or clean the surface -- I mean, you can actually clean the radioactivity off the surface of an object to the point where you can no longer detect it, and it's considered clean at that point.

Appendix A

You would have contaminated liquids. Those can be cleaned up using ion-exchange resins. There's a variety of processes for treating liquid waste. And you end up with water that's no longer contaminated or has very low levels of contamination that you could dispose of at that point.

There is a whole field and a whole industry designed to clean these facilities up -- (static)

MS. TIPPER: Is this figured into the cost of operating the facilities?

MR. MASNIK: Actually, licensees are required by our regulations to have a decommissioning trust fund, which requires them to put a certain amount of money aside each year. The amount of money that is required at the time they permanently cease operation is required by our regulations. It is on the order of three or four hundred million dollars that would have to be put in a trust.

So that money, even if, for example, the utility goes bankrupt or has severe financial difficulties, there's sufficient funds available to clean up the facility.

MS. TIPPER: Well, it's my understanding that TVA's Trust Fund has been deemed insufficient.

MR. MASNIK: Well, I don't know how much there is in the trust fund now, but is there someone here from the licensee who maybe could speak to that issue?

MS. TIPPER: And rates are going up and people are losing their jobs.

MR. CAMERON: There is a decommissioning trust fund for -- it's by reactor or reactor site.

MR. MASNIK: By reactor.

MR. CAMERON: By reactor. If anybody has the information in terms of what is in the trust fund for Browns Ferry, we could provide that. But if we don't have that right here, we'll --

MR. MASNIK: I do know that every two years, by regulation, they are required to submit a report to the NRC which is reviewed by us.

MR. CAMERON: I think we have some information here.

MR. BEASLEY: My name is Craig Beasley; I'm with TVA.

We do have the decommissioning trust fund. The investment is growing now. It's moving up to the levels where it should be. I don't have those numbers, but I can get them for you tomorrow.

MR. CAMERON: Thank you, Craig. Thank you very much.

Jackie, after the meeting, perhaps you can give us the number that you called at the NRC because maybe we're not getting them the right information to be able to tell people. So that would be very helpful to us.

Larry? Anybody have another question before we go on?

Nancy.

MS. MUSE: The only problem I see with this book is there are footnotes and no references, specific scientists or companies that fund the studies that were used to create this book. I didn't see any kind of references here either.

MR. CAMERON: A lot of this is non-profit organizations, government organizations who do this type of work and look at studies that have been done on, you know, Hiroshima or places like that.

Can we get -- not right now, but can we get Nancy a fuller set of background on this that will give her an idea?

MR. MASNIK: I think if she gives Etoy her name and address we will get you some more information. I mean, those pamphlets were designed for people just to have sort of a general understanding of what it is. If you desire more information, we certainly can get it to you.

MR. CAMERON: Okay.

G-1

MS. MUSE: I have a comment about the groundwater. If NEPA does not require the worst-case scenario to be examined or outlined, it seems like it would be a very nice courtesy of NRC and TVA to provide us with information as to what would happen. Say, like, back in 1975 when a candle started a fire. What would have happened or what could have happened if we did have a melt down to the ground water. It would be a courtesy. It is not legally required but --

MR. CAMERON: We'll take that as a comment.

MR. ZALCMAN: My name is Barry Zalzman. Let me quickly address some of the issues that you are raising, the worst-case analysis.

It is probably a wonderful segue 'cause the next person that is going to make a presentation is going to talk about both design-basis and severe accidents and some of those impacts you may be interested in. If you still have questions after Mr. Palla makes his presentation, then perhaps we can have a full discussion on it.

MR. CAMERON: Let's go to Bob Palla now. If there are other questions, we'll come back. Okay. Let's have Bob, as I mentioned, Senior Reactor Engineer, expert on severe accident analysis, probabilistic risk assessment, and he's going to talk about what we know as SAMAs.



## Appendix A

[Presentation by Bob Palla]

MR. CAMERON: Thank you, Bob.

I believe we have a question back here.

MS. MUSE: Well, I understand -- I think the surface level of your process, but I'm wondering just on a layman's level what would happen. Despite all the SAMA and the other terminology you referred to, what would have happened in 1975 or what can still happen if there was a mechanical failure and we did have a melt down? I would like to know, you know, here in this room, what would happen to the groundwater.

MR. PALLA: What would happen to?

MS. MUSE: Yes, if we had a melt down.

MR. PALLA: To groundwater. Well --

MR. CAMERON: In other words, Bob, this may be out of your area because what Nancy is assuming that all of these preventive measures fail and that there's actually is an accident and what would be the effect on the ground water. I don't know if any of us want to speculate on that, except to say that it obviously is not going to be a good event.

MR. PALLA: Let me just begin by saying that all of these postulated events are not equal. Some are more severe than others. You can have a core damage event that core damage is arrested in vessel. The core may never leave the vessel, the radiation may still be contained within the containment. It could be a TMI type accident. So not all accidents result in full-blown core melts, failure of the vessel. Even if the vessel failed, the core damage could still be arrested within the containment.

There are severe guidelines that have been implemented at plants, including Browns Ferry, that direct operators to add water to the containment, to the dry well. So in the event the reactor vessel would fail, and the core would melt through it, there would be water in the dry well, and that this water could quench the debris as it leaves the vessel. So it would be arrested there. Again, it would be contained.

There are certain measures -- in the event that all of those measures fail the core melt isn't a China Syndrome, like in the movies. The molten core debris eventually is quenched. It takes many, many hours to breach a concrete base.

Over the course of -- probably on the order of a day or more, typical time associated with base melt through, certain measures could be taken to confine the fission products.

MR. CAMERON: Thank you, Bob.

Mike, you are going --

MR. MASNIK: We also had some experience unfortunately on this at Three Mile Island where we did have a core melt, and we did have a relocation of 33 tons of the core to the bottom head of the vessel. The system worked. I mean it essentially contained the molten core and there was no release of material through the bottom head.

Subsequent to that, there was some contamination and some of that contamination found its way through the concrete base mat in one of the auxiliary buildings. It did get into the groundwater but it didn't move very much. It turns out that very often the radioisotopes are attached to clay particles, so we didn't see much movement of most of the radioisotopes that were released from the facility.

You can speculate a lot, but we have a little experience in that area as well.

MR. CAMERON: Thank you, Bob; thank you, Mike.  
Jackie.

MS. TIPPER: The Browns Ferry reactors are a BWR mark IGE-4 design, which has numerous inherent safety flaws including elevated spent fuel pools that are vulnerable from above, and above-ground reactor and a thin still shell in place of the traditional containment dome.

Now, I don't know about you all, but the worst case scenario after 911 to me was somebody flying a great big jet into the reactor. And it is my understanding that this plant could not withstand that type of accident.

Also, that the building that the control mechanisms are in does not have a real strong enforcement on it, as well as the above-ground storage.

This is a major concern. I've thought about it many times. I live right across the river. I'm on the other side of the river. I'm a school teacher. You know, I teach children. This is something that we think about.

MR. CAMERON: That's why it is particularly important for you to be here and for us to provide you some information about security generally.

Specifically, if Andy or any of the others can talk about any studies that have been done in terms of, you know, aircraft, this type of design, whatever, I'll turn it over to you.

## Appendix A

MR. KUGLER: I don't have any specific details on this particular design, but even before 911, NRC took security of these plants very seriously. And since 911, obviously, we've taken a lot of steps to even go further.

There have been a number of orders and advisories to the plants to beef up security. A number of changes have been made to improve security at the plants, and the staff is continuing to evaluate what other changes may be appropriate. Obviously, there's a lot of that.

Even if I have the information, I couldn't really say much about it because of the nature of the information. But because it is not something I need to know I don't even have it.

In terms of the way we look at accidents in an Environmental Impact Statement, we don't specifically look at leveling events, you know, attacks on the plant. What we do look at is what things would have to fail, for whatever reason, whether it be because of an equipment failure or because of some intention act, what things would have to fail to lead to these sorts of accidents.

In the sense that we look at the worst case sort of accidents, we do that. We don't look at specific causes such as some external force or starting the event.

I don't know if that helps, but I think that's probably all I have that I could add at this point.

MR. CAMERON: And I think, Barry, we do have a little bit of a summary of some things that we've been doing that provide you with some more detail on that.

Grant.

MR. DASNEY: My first question actually is, how many people are here that are not with the NRC or TVA?

(Hands raised)

So we have five people. Six.

Is a transcript of this going to be made available or disseminated through -- I don't live in this county. I live across the river in another county. I live 15 miles down the river, so whatever happens here, you know, it goes down stream. So my involvement is just as much as anybody that lives in this county where these notices were posted and so forth. They never got to where I live. So I'm interested in that.

You were talking about cost of risk reduction and whether the cost to the supplier (TVA) to reduce a risk is worth what? Is it worth having a leak for the money it is going to cost them to fix it? You talked about evaluating the cost of that reduction. The cost-benefit analysis.

Do you ever think about -- when you build buildings, when you build a surgical center, you expect at some point to recoup that cost the ten billion dollars that it cost you to build that surgical center, eventually at some point it is going to be paid and you are actually going to start making money.

Do you guys ever take into consideration the cost of -- what a facility costs to build, and is it ever going to pay for itself 20 years down the road? Will TVA ever recoup the cost of those billions of dollars to reactive this unit in my life time? If not, why are we doing this? Why are they doing it?

MR. CAMERON: Can we address this?

MR. PALLA: I'll probably start with that one and work backwards as best I can. I hope I can remember the question.

Let me start with that one. From the NRC's perspective it is not really relevant to us whether they recoup their cost. That's a decision they make. I assume they're only going to make a decision like that if they feel they can recoup the cost. But for us, that's not a concern for us. Our concern is safety. So that's a simple answer to that part of that question.

In terms of why we're looking at cost benefit when we're looking at these improvements, the best way to explain that is, our regulations require them to operate within a certain box. As long as they stay within that box, they should be -- they're operating safely. Okay.

What we're doing here is saying, okay, you're inside the box; you're operating safely. That's all good. Are there any other things that you could do that might even make it better? Not necessarily required but they could still make it better.

Then, if we find some things that look like, yeah, these are things that could improve performance in certain accident sequences, then we say, all right, is it worth the possible benefit that you can get out of it.

The thing is that plants have looked at severe accident analysis since the 80s, and issues they've identified -- vulnerabilities that they've identified in their plants have already been dealt with. So at this stage, this far along, we're not likely to find very much but we still look.

Usually, most of the things we are finding now are things that are relatively low cost. Perhaps some additional training or procedure changes. But that's why we look at cost benefits because we're already in the place where the plants are being operated safely, and we're just looking at places where maybe there can be some improvements.

MR. CAMERON: Can we send Grant and others a copy of the transcript?

Appendix A

MR. PALLA: If you signed up on the card and asked to be put on the mailing list, everybody on our mailing list is going to get a copy of the meeting summary, and will also get a copy of the final environmental impact statement when it is issued. Automatically, we just send that out.

In terms of how other people can reach it, we do put these documents -- the environmental impact statements themselves are directly on the web page. Other documents that either we issue or we receive from licensees are available through our document management system, which is also accessible through our web page. Anybody from anywhere can get at these documents.

MR. DASNEY: If they're aware that they're there.

MR. PALLA: If they're aware that they're there. I understand that. That's where the mailing list comes in. When people sign up or come into these meetings and give us the information, we will send them that information. Beyond that, you know, how would you reach everybody in however many counties. There is no way to do it. The people have to -- well, you know, you can't. I can't mail it to everybody in the surrounding counties, but we do make it available on the web so that anybody can get at it if they have an interest.

MR. CAMERON: And you are going to get some more paper.

Let's take another question and, then, go to the summary, and listen to you a little bit more formally.

Nancy.

MS. MUSE: I appreciate the knowledge and wisdom of many folks in this room that know a whole lot more about this technology than I do. And with all due respect, I'm a school teacher also, and I have two questions or statements. And I'm not accusing anyone of actually willingly participating in the comedy of the absurd or the comedy of errors, but it seems like we are dancing around the main issue.

G-2 | All the studies on issue, I really appreciate. Thank you for doing your job. I know you are doing the best you can. But one reason why there is only five of us here is because people in this area don't ask questions. They hear what's in the news or in the newspaper and they don't dig deeper. And with all of these wonderful studies you've done, it still does not address the most crucial issue concerning the operation of this plant.

We came seriously close in 1975 to a very major accident, which was reported on the east and west coast before people in this area knew what had happened.

G-3 | We have politicians who are unopposed to nuclear energy and nuclear power who suppress the stark, cold reality (static)...

G-4 Also, the issue of radioactive waste from this plant, I would like to have a history of where this waste has gone, what kind of waste has gone where, where is it going now, how much of it is still stored on the site. A lot of people don't understand that we have a nuclear waste ground right here in our back yard. And somebody are naive and oblivious to the realities of this technology.

Like I said, it seems like the talk tonight is very useful. And I do know that you're doing the best you can, but we're dancing around the issue. We're playing ring-around-the-rosy.

G-5 Jackie mentioned 911. We all thought these worst-case scenarios were ridiculous and are never going to happen; that people projected that this could happen 30 years ago or if not longer,

G-6 and now we're in the age of the worst-case scenario. I think it is absurd not to be addressing these issues primarily and foremost, especially since the citizens' money is going to fund these projects without them having all of the information out there in front of them. I think it is really immoral. And I'm not blaming any one person in this room because you're doing your job. The technology is here. We did not invent it; we're dealing with it.

But I think it is time to phase it out and I would like for everyone in this room to please consider looking at options to restarting these plants.

Thank you.

MR. CAMERON: Thank you. I think that was more in the form of a comment. Thank you, Nancy. I think that my colleagues would say that we're trying to address the issue to make sure the plants are safe. Our responsibility -- in fact, the only thing we are authorized to do is to consider whether the plants are safe and meeting our safety regulations. And if they do that, then they can offer it unless something changes on the congressional level.

Mike, do you want to talk about conclusions?

[Presentation by Michael Masnilk]

MR. CAMERON: Thank you, Mike.

Before we go to comments, Jackie, do you have a question for us?

MS. TIPPER: I would like those questions Nancy presented concerning the waste to be answered and to know specifically is plutonium produced from nuclear plants, isotopes' half-lives, you know. I would like for the waste to be addressed.

## Appendix A

MR. CAMERON: You just had a question that you raised now about plutonium. Is there any way -- I think, Nancy, you asked about how much spent fuel, basically, is produced by one of these plants. Can we generally address that as well as what the elements are? I mean I want to try to do this. These are important points, but I would like to try to do it simply, if we could, right now.

Mike, I don't know if we can or if you are the right person, but I think you sense what the type of information is that Jackie and Nancy would like to hear, which talks about volume, quantity, and potential toxicity, I guess.

MR. MASNIK: I'll answer the simplest question first, and that is, during nuclear reaction in the reactor core, plutonium is produced and it is one of the fission products. That plutonium, of course, is part of the spent fuel and it is considered self-protecting in that it is so radioactive that it would be very difficult for someone to get very close to it.

The question on waste, I can't give you a precise number of the volume or the weight of waste that is produced. But I've read accounts where the amount of high-level waste that is generated by a plant during one year of operation could fit underneath one of these tables. It is not -- I mean, it is the form of long rods now, but if you disassemble those rods and put that amount of material in a container, it would be about the size of one of -- it would be able to fit underneath one of these tables.

That waste is currently stored on site. There is no place at this time to ship that waste. The waste is stored in spent fuel pool, in a wet environment (in a pool, under water) and the licensee also has plans to store the fuel in dry storage, in an independent spent fuel storage facility, or ISFSF site until a permanent high-level waste repository is available, and then the fuel will be shipped there and disposed of permanently.

MR. CAMERON: Two followups on that and then we're going to go to the next part of the meeting.

Nancy.

G-7 MS. MUSE: Well, it goes against common sense to plunge forward with this technology when we've had years to find this permanent repository or depository for the spent fuel.

Science is wonderful, but it doesn't compare with common sense then it's not very useful.

If you have a toilet that's clogged up, you don't keep using the toilet.

G-8 I have concerns too. I think more people would be here tonight if these kinds of issues were in the newspaper, if the politicians didn't stifle this information, which I know does happen. If you start talking about transporting this highly radioactive material across the country to Utah or out

west to the Rocky Mountains, there are going to be people in those states that are going to not be happy. That's already been proven to be true. And they're going to see people very worried about the security of that transported waste.

And to me it is just absurd to have these kinds of questions looming over our heads and to spend all of this money to further this technology.

MR. CAMERON: Thank you, Nancy; we have that comment on the transcript.

Jackie.

H-1 MS. TIPPER: One of the things mentioned in the study has to do with the economic impact. Well, the half-life of plutonium is -- what is it(?) 240,000 years? That's going to have to be guarded for that long. How can we rationalize this to our children, to the future? We don't even have a place to put it right now.

Like Nancy said, this really doesn't make any sense.

H-2 The economic impact also. I mean how much money is that going to cost? In this area right now TVA, their estimated cost for restarting Unit 1 is 1.8 billion dollars, which exceeds the U.S. Department of Energy's highest cost estimate by \$100 million. TVA has an existing debt of around \$250 billion and they don't have much more room on that. This is being passed on to their customers. This is a major concern here.

H-3 People are losing their jobs and there are people considering -- no people, whole areas that are considering not even using TVA power now. This is something to think about, too. This is going to be on the back of the future. We need to consider these things, definitely.

MR. CAMERON: Thank you, Jackie.

MR. MASNIK: I understand the comment, and we'll consider it.

H-4 MS. TIPPER: One more, okay? I know that you won't go in and do the inspections and everything. Please do a really good job, because on Unit 1 there have been a number of whistle blowers that have lost their jobs.

One acquaintance of mine is an avid supporter of nuclear power. He did his job; saw things that should have been done in other ways, or were not being done properly; he lost his job. Things like this are going on.

When we almost had the melt down with the first accident, I knew some of the people that worked at Browns Ferry, and one of them was a operator who was a severe alcoholic. He was killed in a car wreck on the way to work.



Appendix A

I thought okay, it's better now. We don't really have to worry about this, you know. TVA has really cleaned up their act and they're doing a better job. Then, when I hear about all of these whistle blowers with Unit 1, that's scary. That's really scary. And I did know this guy, and he was an operator.

You all have got to do the very, very best that you can to make sure that everything -- if it happens, it's done really right.

H-5 How many other plants in the United States have been relicensed? Aren't most people getting away from nuclear power? Renewable energy sources. If we had just put the money that we poured in to nuclear power toward renewable energy sources and conservation. We don't do squat with conservation. We could save billions and billions of dollars just with conservation.

MR. CAMERON: One thing we can get is the number of license renewals. And at the risk of you getting one more piece of paper -- because he's thinking over there -- we do take very seriously allegations from people who raise safety concerns.

With that, Barry, could you bring that pamphlet over for Grant and Jackie?

Thank you for that admonition and we take that seriously.

MR. MASNIK: I just want to say the number is about 20, 21 have had their license renewal, and 21 units and not necessarily sites. We have five or six inhouse now. There have been quite a few. And we do take our job very seriously. I want you to know that.

MR. CAMERON: We're going to move on to the formal comment part of the meeting. We can come back if there's another question, but I really would like to get you on and get it on the record.

Usually, when we do these, we find it useful to have people here just generally, before they talk what the rationale and the vision, so to speak, of the company is in terms of license renewal.

We have Mr. Chuck Wilson as our first speaker who is the License Renewal Environmental Management Project Manager for TVA. Would you like to address us for a few minutes?

MR. WILSON: Thanks, Chip. I'll be very brief.

Once again, I'm Chuck Wilson. I'm the License Renewal Environmental Project Manager for TVA. I've got a couple of comments to make.

TVA is reviewing also NRC's draft environmental impact statement and will be providing comments on or before the comment period closes March 2nd.

- I-1 TVA agrees with NRC's basic overall conclusion that the environmental impacts of Browns Ferry License Renewal are minimal. We can say that because being a federal agency we also have to comply with NEPA.
- I-2 In the spring of 2002 we completed our own environmental impact statement which addressed Browns Ferry License Renewal and Browns Ferry Unit 1 restart. There were no significant environmental impacts, and we did find that, in general, license renewal allows power production without greenhouse gases, which is consistent with TVA's clean air initiatives that you hear so much about.
- License renewal also maximizes use of existing assets and it avoids the impacts of new site construction.
- So, in general, we fully supported renewing the licenses of Browns Ferry as a good thing to do.
- Thanks. That's all I've got to say.
- MR. CAMERON: Thank you very much.
- We're going to go to Jackie. Would you like to come up and comment for us? You can stay there and use this, if you prefer, or you can come up there.
- MS. TIPPER: I'll use this.
- H-6 The major problem with nuclear power has to do with storage of the waste. I don't think anybody has really figured in how much this is going to cost. I don't think they can. That's what makes nuclear power totally unfeasible, and the possibility of accidents, even though they might be very remote, would be so catastrophic that we're going with this.
- H-7
- H-8 There are alternatives. There are answers to clean air other than nuclear power. We have incentives for solar power and conservation. There's nothing out there now.
- Jimmy Carter had great programs going for getting people into renewable energy sources. We're not doing any of that now. We can come up with solutions that are safe that the generations ahead of us are not going to have to take care of and guard and be afraid of. This is what is just wrong. It is morally wrong what we're doing.
- H-9 How can you tell children, you know, we can burn all the lights we want to and it will be cheap. It is not going to be cheap. It is expensive. TVA has spent a fortune on their power. (static) ...Yellow Creek with babies and backpacks...(static) ...they're grown up and their activists also.
- H-10 It was wrong then and it is wrong now. You all can do your job the very best you can, but that waste is still going to be there. And we don't have faith in the human race, if this is the only way

Appendix A

H-11 | to go. We are too short sighted. Everybody maybe thinks that the world is going to end tomorrow, but we don't know. We're supposed to be stewards. We don't know this.

And I sure wish there were more people that paid attention and cared. So few people read the paper. Still look at the elections -- I won't go there.

Amendment 2 failing. That's one of my main peeves right there.

This is something that we really need to look at, and the cost of it. I hear that they're talking about -- well, no, not here that they're talking about, there's been a huge grant to do a study for Bellefonte. And what did we pump in to an endless pit there, \$4 billion dollars, was it? Four billion dollars for absolutely nothing now. And now we're going off on some other tangent.

Let's just try to do better.

MR. CAMERON: Thank you, Jackie.

Nancy, can we go to you and then we'll go to Grant. Do you want to come up or do you want to use this?

MS. MUSE: I'm Nancy Muse, Florence, Alabama.

This may not be the most appropriate time for me to voice this concern or make a comment about responsibility, corporate responsibility or government responsibility, ethical responsibility.

One of the guys that was involved in an accident at Browns Ferry not too long after we had this meeting -- I guess it was last year, last spring, last April -- happened to be one of my old students when I taught him in high school. And as fate would have it, our paths crossed shortly after that accident.

G-9 | He described to me what happened to him. He inhaled radioactive particles or particulates and I cannot envision exactly how it happened, but I believe it was radioactive water or steam escaped into the air and he happened to be there at the wrong time, and he inhaled it.

G-10 | Now what really was totally immoral and absurd that this nuclear industry from the uranium mining all the way to the making of plutonium avoids any responsibility when workers in the mines, Native Americans, on down the line, pipefitters, get cancer. They always claim that it had nothing to do with the exposure of those workers, and somehow have gotten by with this.

There was a lawyer from Tennessee that represented indigenous Native Americans back in, I guess, the 70s who had their skin falling off, who had worked in the uranium mines. The industry denied any wrongdoing or any responsibility to help these people.

One of my lingering question marks is, this ex-student is a great guy. He used to wear snakeskin boots and have one of those little Billy Ray Cyrus haircuts back in the 80s, loves life. One of these days if he gets lung cancer or leukemia or some other form of cancer what is TVA going to say to him: well, we had nothing to do with it?

If I'm in the nursing home and I can still find out what's going on, if I can make it that long, I'm going to follow him around and I'm just going to see what happens to him. I'm going to document it. I'm going to make my own personal file on this ex-student of mine that I love dearly and see what happens to him. And if this industry is going to take the responsibility of what may befall him. He's just one out of a thousand workers who have not been in the reports because it isn't very good for the industry to admit that these things have happened, and no responsibility has been taken by the industry.

For now that's it.

MR. CAMERON: Thank you, Nancy.

Grant, do you want to talk to us?

MR. DASNEY: Well, one major comment is on the economic side, as I mentioned earlier. If you build a clinic, then at some point you expect that clinic to be paid for before it starts making money.

J-1 TVA has spent \$2 billion to restart Browns Ferry Unit. Is it possible that TVA is going to recuperate \$2 billion from one nuclear reactor in 20 years? It doesn't seem likely to me that's going to happen.

They abandoned a \$360 million project, a gas-fired power plant a \$150 million into the project, and it was deemed lack of demand. That was in March of '02. So from '02 to now we've come to the point where we need to spend \$3 billion to reactivate a nuclear reactor, and I don't understand how it is going to be paid for or how it is going to pay for itself. The math doesn't work in my head. Maybe I don't know how to add figures that bid. It doesn't work for me.

MR. CAMERON: Thank you very much.

I think that's the last formal speaker that we had. I know that Nancy was holding a question from before. Do you still have a question?

MS. MUSE: I had a question. What's another ten minutes? Just kidding. It might take one minute.

G-11 This is just for the record. I'm Nancy Muse from Florence, Alabama. I'm against TVA's future commitment, or present commitment also, to the nuclear program, regardless of the specific information within the environmental assessment and/or environmental impact statement.