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October 30, 1995

Dr. Shirley Lee Jackson
Commissioner
Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Dear Dr. Jackson:

I recently received the attached information from my constituent, Ms. Jeannine Honicker, regarding the safety of Watts Bar Unit 1.

Ms. Honnicker has shared with me her allegations of safety violations at Watts Bar Unit 1. I would greatly appreciate your looking into this matter and providing me with a response so that I might properly reply to my constituent's inquiry.

If you require any additional information or have any questions, please do not hesitate to contact Jay Hansen of my staff at (202)225-4311.

Thank you in advance for any assistance you may be able to provide. I look forward to hearing from you.

Sincerely,

Bob Clement
Member of Congress

BC/jh
Enclosure

OCT 26 REC'D

362 Binkley Dr.
Nashville, Tn. 37211
October 20, 1995

Representative Bob Clement
1230 Longworth House Office Bldg.
Washington, DC, 20515

Dear Representative Clement:

Based on unresolved design flaws, safety problems and TVA identified deficiencies documented in NRC Inspection Report #50-390/95-47 & 50-391/95-47, unresolved questions surrounding the solvency of TVA, detailed in the August 1995 GAO report "TENNESSEE VALLEY AUTHORITY, Financial Problems Raise Questions About Long-term Viability" (GAO/AIMD/RCED-95-134) and a decommissioning fund which appears to be woefully inadequate, (see my enclosed letter, dated October 20, 1995, to Mr. John M. Hoskins, Vice President & Treasurer of TVA, with documentation), I respectfully request that you use your considerable political influence to intervene in NRC's issuance of a fuel loading permit and operating license for the Watts Bar Nuclear Plant.

Sincerely,

Jeannine Honicker

Jeannine Honicker

362 Binkley Dr.
Nashville, Tn. 37211
October 20, 1995

Mr. John M. Hoskins, Vice President & Treasurer
Tennessee Valley Authority
400 West Summitt Hill Rd.
Knoxville, Tn. 37902-1499

Dear Mr. Hoskins:

Thank you for your letter of September 28, 1995 responding to my request for information concerning TVA's decommissioning fund. I am afraid the letter raises further questions.

I notice in TVA's "Energy Vision 2020" (Draft, volume 2, dated 7/95, page T3.8) the following:

"TVA has established a nuclear decommissioning fund for all of its operating nuclear reactors. Investments of power funds have been made since 1982 to provide for the accumulation of funds for decommissioning nuclear plants. By September 1993, the lowest interest rate environment in 20 years resulted in a situation where the market value of the decommissioning investment was significantly higher than their book value of $210 million. TVA elected to exercise the flexibility of the internal fund, and sold the investments through a competitive bid for $373 million.

"TVA elected to return the proceeds to the decommissioning fund over a three year period beginning in fiscal year 1994. At the end of fiscal year 1994, the fund had $150 million. Plans are to add an additional $100 million by the end of fiscal year 1995, and an additional $123 million by the end of fiscal year 1996."

Your letter stated:

"TVA sold the $210 million of investments in this fund in 1993 due to market conditions that created an unusual opportunity for a significant gain in these securities. TVA used the proceeds of this sale for the

<u>power program. This fund was replenished in 1994 and 1995.</u>

<u>"If TVA had maintained the original investment portfolio, it would currently have a balance of $245 million. All of TVA's decommissioning investments have been in high quality fixed income investments."</u>

Why does The Energy Vision 2020 document say $373 million and your letter says $210 million?

If the fund or funds had to be sold to realize the appreciation, why were the proceeds not immediately reinvested as good management of the decommissioning fund would dictate, instead of being put in the power program? If it was sold and immediately reinvested, what would be the value of the fund today?

How did you arrive at the conclusion of your letter that the fund would be worth only $245 million if it had been left alone, and why is the balance currently $261 million?

If in fact the fund was worth only $210 million, who bought it for $373 million? Was the $210 million the amount of TVA money that had been invested since 1982 that had grown to $373 million, or was the current value $210 million and by competitive bid some entity paid TVA $373 million? Who would have made such a bad financial move, and why would they do it? Specifically, who did purchase it?

If in fact the decommissioning fund was invested in high quality fixed income investments and had grown to a value of $373 million when it was sold in 1993, as the Energy Vision says, how much would it have been worth at the end of fiscal year 1996 versus how much it will be worth with the repayment plan as outlined in Energy Vision 2020?

Are you still following the plan outlined in Energy Vision 2020, or have you modified that repayment schedule?

Did you inform the NRC of your plans to empty the decommissioning fund in 1993 and add the proceeds to the power program? Did they give you a written authorization to do this?

How is this fund going to be adequate to decommission three units at Brown's Ferry and two units at Sequoyah? How much more per year will you add to include the decommissioning costs of Watts Bar?

What is the formula that you used to determine how much you will need to decommission each unit? When do you anticipate decommissioning each unit? What are your plans for disposing of the radioactive waste that is accumulating at each reactor site, both in and out of the spent fuel pool, when the time comes to decommission each unit? In effect, the whole plant will be waste, so just how do you plan to dispose of it and clean up the entire site?

Enclosed is Appendix A from MSB Energy Associates report entitled TVA Watts Bar Unit 1 Decommissioning Cost Estimates. How do your guidelines, formulas, calculations, and assumptions compare with theirs?

Sincerely,

Jeannine Honicker

Jeannine Honicker

Encl:

C: Dr. Shirley Jackson, Chairperson, NRC
Mr. Peter S. Tam, Sr. Project Mgr., NRR, NRC
Mr. J. D. Lee, Esquire
Mr. Clifford Honicker
Ms. Jackie Kittrell, Esquire
Ms. Helen deHaven, Esquire
Representative Bob Clement
Senator Fred Thompson
Senator Bill Frist
TVA Board of Directors
et al

Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902-1499

John M. Hoskins
Vice President and Treasurer

September 28, 1995

Ms. Jeannine Honicker
362 Binkley Drive
Nashville, Tennessee 37211

Dear Ms. Honicker

This letter is written in response to your request for information on TVA's decommissioning fund on September 26.

TVA maintains a decommissioning fund that will be used to clean up all the areas exposed to radioactivity once the operating license of a nuclear plant expires. This fund currently has a balance of $261 million. Next year TVA will make further contributions to this fund.

TVA sold the $210 million of investments in this fund in 1993 due to market conditions that created an unusual opportunity for a significant gain in these securities. TVA used the proceeds of this sale for the power program. This fund was replenished in 1994 and 1995.

If TVA had maintained the original investment portfolio, it would currently have a balance of $245 million. All of TVA's decommissioning investments have been in high quality fixed income investments.

Sincerely,

John M. Hoskins

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FIGURE T3-10. **TVA's Nuclear System**

Nuclear in Fiscal Year	Summer Net Capacity (MW)	EAF (%)	Heat Rate (Btu/kWh)	Fuel Cost ($/MWh)	Total O&M ($/kW)	Total A&I ($/kW)
1994 (Actual)	3,282	65.6	10,140[1]	11.0[2]	90.7	29.8[3]
2005	5,517	67	10,475	5.4	113.6	19.1

[1] Sequoyah 2 heat rate given is typical of all nuclear units.
[2] In 1994 TVA took steps to write off sunk interest charges on excess fuel inventory. This will result in future fuel expenses that are significantly lower but are more in line with market costs.
[3] Capital expenditures for SQN 1, SQN 2, and BFN 2 plus central office TVAN only.

TVA expects an increase in availability factor for its nuclear system due to plant upgrades. Fuel costs are projected to drop significantly following the write-off of interest charges on excess fuel inventory in 1994.

reactors, such as those at Browns Ferry, are not as susceptible to vessel aging as pressurized water reactors; second, these units have been brought up to current standards. TVA will follow closely the proposed Nuclear Regulatory Commission rule making on license extensions, but TVA anticipates these facilities will be available over the Energy Vision 2020 study period.

TVA has established a nuclear decommissioning fund for all of its operating nuclear reactors. Investments of power funds have been made since 1982 to provide for the accumulation of funds for decommissioning nuclear plants. By September 1993, the lowest interest rate environment in 20 years resulted in a situation where the market value of the decommissioning investments was significantly higher than their book value of $210 million. TVA elected to exercise the flexibility of the internal fund, and sold the investments through a competitive bid for $373 million.

TVA elected to return the proceeds to the decommissioning fund over a three year period beginning in fiscal year 1994. At the end of fiscal year 1994 the fund had $150 million. Plans are to add an additional $100 million by the end of fiscal year 1995 and an additional $123 million by the end of fiscal year 1996.

TVA's policy is to collect funds for decommissioning through rates based on a constant dollar amount adjusted for inflation over the life of the operating license of a nuclear plant. This policy is based on the theory that all ratepayers that benefit from the electric production of a nuclear plant should share equally in the cost of decommissioning. If TVA front-loaded the collection of the nuclear plant decommissioning funds, this would put an undue burden on the ratepayers receiving power generated during the early years of operation of the nuclear plant. On the other hand, if not enough funds were collected throughout the life of the plant, the ratepayers receiving power at the end of the operating license would have an unfair decommissioning burden.

Decommissioning expense has been recovered from ratepayers annually based on the present value of amounts not provided through earnings on the fund. In fiscal year 1990, these

FIGURE T3-11. **Projected Availability of Power Through Interchanges**

YEAR	BLOCK 1 Quantity (MW)	BLOCK 1 Price $/MWh	BLOCK 2 Quantity (MW)	BLOCK 2 Price $/MWh	BLOCK 3 Quantity (MW)	BLOCK 3 Price $/MWh
1995	250	23	250	27	1800	40
2000	300	27	300	32	1500	56
2005	0	N/A	300	39	1500	75
2010	0	N/A	0	N/A	1100	106
2015	0	N/A	0	N/A	1000	135
2020	0	N/A	0	N/A	1000	165

This figure shows the amount of power expected to be available through the interchange system through 2000. For each year, power is shown to be available in blocks with varying cost.

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collections amounted to $18 million. TVA temporarily suspended decommissioning collections from customers after operating license life extensions were obtained for Browns Ferry and Sequoyah. The temporary suspension was made in an effort not to front-load decommissioning collections. Cashing in the gain on the market value of the fund in 1993 has resulted in a reduction of the annual decommissioning expense collection through rates to $13 million currently based on a projected long-term return of 8 percent. If alternative investments with a higher rate of return could be achieved, the annual collection could be lowered further. Collections for the decommissioning fund will resume in fiscal year 1995.

INTERCHANGES WITH NEIGHBORING UTILITIES

TVA has various types of interchange arrangements with neighboring electric systems that allow TVA and these utilities to buy, sell, and exchange power at times when it is mutually beneficial to do so. TVA anticipates that there will be some quantities of non-firm spot market power available, even during peak periods, for the future. Spot market power is power that is available for purchase on the open market, usually surplus power that may be available at any given time from a generating utility. "Non-firm" implies that TVA will not pay capacity charges for the power, and other utilities will not guarantee that it is available.

For planning purposes, TVA has assumed the quantities and price shown in *Figure T3-11.* These blocks are representative of purchase power from neighboring utilities. Depending on the economic loading of the power system, these blocks can be used to offset more expensive internal generating resources.

TVA also anticipates that it will be able to make off-system sales because of differences in timing of system peaks between TVA and neighboring utilities. Over the Energy Vision 2020 study period, these interchange purchases and sales are anticipated to be roughly in balance.

TRANSMISSION SYSTEM

TVA's transmission system serves an area of more than 80,000 square miles, serving a population of approximately 7.6 million. The system includes approximately 16,000 miles of transmission line, including 9,800 miles of 161,000 volt lines and 2,400 miles of 500,000 volt lines.

The system is used to transmit power to 160 distributors of TVA power. These distributors include 50 electric cooperatives, 107 municipal electric systems, and 3 county-operated systems. TVA also directly serves over 60 large industries and Federal installations. In addition, the transmission system is connected directly with 13 neighboring utilities. These interconnections allow TVA to buy power from and sell power to other utilities and to wheel electricity from one utility to another using TVA's power transmission system. *Figure T3-12* lists the electric utilities with which TVA has exchange agreements and the number of interconnections TVA has with each.

TVA is a member of the Southeastern Electric Reliability Council, a voluntary industry oversight organization dedicated to promoting electric system reliability by identifying and enforcing good engineering and operating practices. The Southeastern Electric Reliability Council is a subgroup of the North American Electric Reliability Council, which provides oversight for the entire North American grid. Through these arrangements, TVA has access to emergency backup power.

FIGURE T3-12. Interchange with Neighboring Utilities

Neighboring Utilities with Transmission Ties	Interconnections
Associated Electric Cooperative Incorporated	1
Appalachian Power Company	7
Big Rivers Electric Cooperative[1]	7
Carolina Power & Light	1
Central Illinois Public Service	1
East Kentucky Power Cooperative	6
Electric Energy, Inc. (DOE Paducah)	8
Energy Services (Arkansas Power & Light and Mississippi Power & Light Co.)	6
Kentucky Utilities Company	8
Louisville Gas & Electric Company	1
Nantahala Power & Light Company	1
Southern Company (Alabama Power and Georgia Power)	9
Union Electric	1
TOTAL	**57**

[1] Delivery points for power purchased by Big Rivers from the Southeastern Power Administration.

TVA has the capability to exchange power with 13 neighboring utilities which allows power to be bought, sold, or wheeled to meet utility needs.

APPENDIX A

TVA Watts Bar Unit 1
Decommissioning Cost Estimates

Prepared for Greenpeace
by David A. Blecker - MSB Energy Associates, Inc.
August 10, 1995

Summary:
A review of current literature and cases leads to the following estimate of Watts Bar Unit 1 (WB1) decommissioning costs (expressed in 1994 dollars for a 1996 shutdown):

Minimum Cost: $475 million
Maximum Cost: $665 million

These estimates do not include contingency factors for unknown and unquantifiable events. Contingency factors are designed to include such events as labor problems, weather stoppages, equipment/tool problems, regulatory changes and procedural changes. In New York, the Shoreham decommissioning study added a 40.7% contingency factor and in 1987, the California Energy Commission ordered a 50% contingency factor for the Diablo Canyon decommissioning. If a 50% contingency factor is added to the WB1 decommissioning cost estimate, the costs increase to:

Minimum Cost: $713 million
Maximum Cost: $996 million

An year by year estimate of the decommissioning costs that would be incurred if TVA delays shutting down WB1 are shown on the attached table.

These numbers were derived using three methods described below.

Method 1 uses a simple linear regression solely as a function of time based on an analysis of 157 nuclear decommissioning cost estimates. Its formula is given by:

$$\text{Cost (\$/kW)} = 71.92 + (18.27 * \text{year})$$

Method 2 uses also uses a linear regression but adds variables for time, plant type (PWR or BWR), sister units and plant size. The following regression equation was used:

$$\text{Cost (\$/kW)} = 256.75 + (20.43 * \text{year}) - 38.39 - 57.16 - (0.1538 * \text{MW capacity})$$

Method 3 is based on the arithmetic average of 14 nuclear decommission cost estimates and is given by the expression:

Cost ($/kW) = 465 per kW

Assumptions:
Typical NRC operating permit license lifetime equals 40 years however no nuclear plant has ever reached its allowed end-of license period. The oldest operating reactor in the U.S. is Big Rock Point 1 in Michigan at 30 years. Fifteen reactors have been shut down early with economic factors most often cited as the predominant cause. For planning purposes, 30 years is the recommended "energy producing life" for operating nuclear reactors.

The numbers presented herein assume TVA would start Watts Bar 1, and then shut it down in 1996 as its true costs become apparent. For an early shutdown like this, Methods 1 and 2 are the appropriate values to use. If the shutdown occurs later in time, then Method 3 which includes the effects of inflation and a real escalation rate should be used.

If TVA fuels Watts Bar 1, will they incur decommissioning costs?
Yes, any fuel load-out and associated system testing will force TVA to incur decommissioning costs.

If WB1 is fueled and decommissioning costs will be incurred, why not just let the plant run and pay for it later?
The cost to decommission a nuclear plant increases with the amount of time the plant has been fueled and operating. If Watts Bar 1, is fueled when planned, it will incur some decommission costs even if TVA decides to shut it down before commercial operation. But the longer it remains fueled and is subject to low- and high-power testing, the more expensive it will be to decommission the unit. This is a result of several factors: 1) Hot plant operation consumes fuel which in turn generates high and low level radioactive wastes. 2) Neutron bombardment (a byproduct of fission) of the containment structure causes the structure's metals and concrete to become radioactive, and 3) Low levels of tritium are produced from neutron bombardment of hydrogen in the primary cooling system resulting in a contamination of the primary cooling loop components.

Studies have indicated that the escalation rate of decommissioning cost estimates has run as high as three to 9 percent over the rate of general inflation. This means that each year TVA waits to decommission WB1, the expected costs to decommission the plant will rise exponentially. To demonstrate the effect of an escalation rate in this range, consider that the value of an investment made today will double in only 10 years if it is earning seven percent annually.

Two factors should be clear:

1) It will be less expensive to shut down Watts Bar 1 if it has not been fueled
2) Even is it is fueled and tested, it will still be significantly less expensive to shut it down sooner rather than later.

Won't TVA's payments to its nuclear decommissioning fund cover those costs?
A preliminary review of TVA's financial statements indicate it is highly unlikely that TVA is accurately funding decommissioning accounts. The TVA 1994 Annual Report lists a fund balance of $264 million. Additionally, the TVA's Annual Report of Public Electric Utilities states that the decommissioning provision for Brown's Ferry is $190 million/unit and $150 million for each Sequoyah unit (1990 dollars). If TVA's WB1 decommissioning estimates are similar, they will clearly encounter severe financial problems at the plant's end-of-life.

Why is decommissioning cost estimation important?
Accurately accounting for nuclear decommissioning costs is important for several reasons. First and foremost is so that TVA can establish and properly fund decommissioning accounts now to ensure the required funds are available when they are needed. Failure to do so may result in huge rate increases for TVA customers or Federal bailouts at the time of decommissioning. The second reason is so that electricity costs and rates accurately reflect the full cost of generating electricity from nuclear power.

Data sources:

- State of New Hampshire, Nuclear Decommissioning Finance Committee, Docket No. 93-01. Prepared testimony of Bruce Biewald and William W. Dougherty on behalf of the Office of Consumer Advocate. September 14 1994.
- The Energy Journal. Volume 12, Nuclear Decommissioning Issue. 1991.
- EIA-412. TVA. Annual Report of Public Electric Utilities. 1993.

Appendix A

WATTS BAR UNIT 1 DECOMMISSIONING COST ESTIMATES

Unit Size	1270	MW		Real Escalation:	2.00%		
InService	1996			Contigency Factor:	50.00%		
Inflation	4.0%						
		(Real 1994 $)		(Real 1994 $)		(Nominal 1994 $)	
OP Year	CY	Method 1 - base	+ contigency	Method 2	+ contigency	Method 3	+ contigency
0	1996	$ 555,420,831	$ 833,131,246	$ 475,412,825	$ 713,119,237	$ 664,543,931	$ 996,815,896
1	1997	$ 578,624,760	$ 867,937,140	$ 501,354,353	$ 752,031,529	$ 704,948,202	$ 1,057,422,303
2	1998	$ 601,828,688	$ 902,743,033	$ 527,295,881	$ 790,943,821	$ 747,809,052	$ 1,121,713,579
3	1999	$ 625,032,617	$ 937,548,926	$ 553,237,409	$ 829,856,113	$ 793,275,843	$ 1,189,913,764
4	2000	$ 648,236,546	$ 972,354,819	$ 579,178,937	$ 868,768,405	$ 841,507,014	$ 1,262,260,521
5	2001	$ 671,440,474	$ 1,007,160,712	$ 605,120,465	$ 907,680,697	$ 892,670,640	$ 1,339,005,961
6	2002	$ 694,644,403	$ 1,041,966,605	$ 631,061,993	$ 946,592,989	$ 946,945,015	$ 1,420,417,523
7	2003	$ 717,848,332	$ 1,076,772,498	$ 657,003,521	$ 985,505,281	$ 1,004,519,272	$ 1,506,778,909
8	2004	$ 741,052,261	$ 1,111,578,391	$ 682,945,049	$ 1,024,417,573	$ 1,065,594,044	$ 1,598,391,066
9	2005	$ 764,256,189	$ 1,146,384,284	$ 708,886,577	$ 1,063,329,865	$ 1,130,382,162	$ 1,695,573,243
10	2006	$ 787,460,118	$ 1,181,190,177	$ 734,828,105	$ 1,102,242,157	$ 1,199,109,397	$ 1,798,664,096
11	2007	$ 810,664,047	$ 1,215,996,070	$ 760,769,633	$ 1,141,154,449	$ 1,272,015,249	$ 1,908,022,873
12	2008	$ 833,867,975	$ 1,250,801,963	$ 786,711,161	$ 1,180,066,741	$ 1,349,353,776	$ 2,024,030,664
13	2009	$ 857,071,904	$ 1,285,607,856	$ 812,652,689	$ 1,218,979,033	$ 1,431,394,486	$ 2,147,091,728
14	2010	$ 880,275,833	$ 1,320,413,749	$ 838,594,217	$ 1,257,891,325	$ 1,518,423,270	$ 2,277,634,905
15	2011	$ 903,479,761	$ 1,355,219,642	$ 864,535,745	$ 1,296,803,617	$ 1,610,743,405	$ 2,416,115,108
16	2012	$ 926,683,690	$ 1,390,025,535	$ 890,477,273	$ 1,335,715,909	$ 1,708,676,604	$ 2,563,014,906
17	2013	$ 949,887,619	$ 1,424,831,428	$ 916,418,801	$ 1,374,628,201	$ 1,812,564,142	$ 2,718,846,212
18	2014	$ 973,091,548	$ 1,459,637,321	$ 942,360,329	$ 1,413,540,493	$ 1,922,768,041	$ 2,884,152,062
19	2015	$ 996,295,476	$ 1,494,443,214	$ 968,301,857	$ 1,452,452,785	$ 2,039,672,338	$ 3,059,508,508
20	2016	$ 1,019,499,405	$ 1,529,249,107	$ 994,243,385	$ 1,491,365,077	$ 2,163,684,417	$ 3,245,526,625
21	2017	$ 1,042,703,334	$ 1,564,055,001	$ 1,020,184,913	$ 1,530,277,369	$ 2,295,236,429	$ 3,442,854,644
22	2018	$ 1,065,907,262	$ 1,598,860,894	$ 1,046,126,441	$ 1,569,189,661	$ 2,434,786,804	$ 3,652,180,206
23	2019	$ 1,089,111,191	$ 1,633,666,787	$ 1,072,067,969	$ 1,608,101,953	$ 2,582,821,842	$ 3,874,232,762
24	2020	$ 1,112,315,120	$ 1,668,472,680	$ 1,098,009,497	$ 1,647,014,245	$ 2,739,857,410	$ 4,109,786,114
25	2021	$ 1,135,519,048	$ 1,703,278,573	$ 1,123,951,025	$ 1,685,926,537	$ 2,906,440,740	$ 4,359,661,110
26	2022	$ 1,158,722,977	$ 1,738,084,466	$ 1,149,892,553	$ 1,724,838,829	$ 3,083,152,337	$ 4,624,728,506
27	2023	$ 1,181,926,906	$ 1,772,890,359	$ 1,175,834,081	$ 1,763,751,121	$ 3,270,607,999	$ 4,905,911,999
28	2024	$ 1,205,130,835	$ 1,807,696,252	$ 1,201,775,609	$ 1,802,663,413	$ 3,469,460,966	$ 5,204,191,448
29	2025	$ 1,228,334,763	$ 1,842,502,145	$ 1,227,717,137	$ 1,841,575,705	$ 3,680,404,192	$ 5,520,606,288
30	2026	$ 1,251,538,692	$ 1,877,308,038	$ 1,253,658,665	$ 1,880,487,997	$ 3,904,172,767	$ 5,856,259,151

NOTES:

Method 1: Simple regression.

Method 2: Multi-variable regression.

Method 3: 1993 arithemetic average.

All costs expressed in 1994 dollars