RAS 4628

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UNITED STATE OF AMERICA
NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges
Thomas S. Moore, Chairman
Dr. Peter S. Lam
Dr. Thomas S. Elleman

In the mater of	)	Docket Nos. 50-327-OLA
TENNESSEE VALLEY AUTHORITY	)	50-328-OLA
Sequoyah Nuclear Plant Units 1 & 2	)	50-390-OLA
Watts Bar Nuclear Plant, Unit 1	)	July 3, 2002

ADDENDUM TO CONTENTIONS OF JEANNINE HONICKER

Please accept this addition to my contentions. I would have filed this under 2.714.3 normally, but since there will be no pre-hearing conference, I ask that you accept it under 2.714.a.l.

(a) Good Cause. I did not have access to the DOE/EIS-0288, Final Environmental Impact Statement for the Production of Tritium in a Commercial Light Water Reactor" until after I had filed the contentions. Gill Francis, the TVA public relations officer, called me after TVA's response to my request to reply to their answers to my contentions and asked me what I wanted. I requested the DOE/EIS, which he very kindly had the DOE send to me. The information in this addendum would certainly have been included inn my original contentions, which I filed before the deadline, had I had access to the DOE/EIS-0288 prior to that date..

After I received the DOE/EIS, I was further delayed by illness in the family. My brother had two severe surgeries, including a kidney transplant that absolutely required that I be with him. His wife is deceased, and there is no other family member available to care for him. Until just a few days ago, I have been completely absorbed with his care. This was an unavoidable delay.

(b) Availability of other means, etc. There is no alternative except this hearing to include the very important facts that I wish to present to you in this addendum.

(c) Extent to which my participation will assist in developing a record. If this addendum is not accepted, this information will not be presented.. It is vital to the health and safety of the public that this information be considered. We have seen delays because of scheduling of the Board and the second delay of the Environmental Assessment by the NRC. Consideration of the material included herein is not special treatment, it is equal treatment. This addendum goes to the heart of the safety of the people who will be in harms way because of unproven and erroneous assumptions that

result in errors in dose calculations, as outlined in the DOE/EIS. Including this addendum will most certainly assist in developing an accurate record.

(d) Extent to which petitioners interest will be represented by other parties. The information that is included in this addendum is not included in We the People's contentions. If it is not allowed, it will not be made a part of the record. .

(e) Extent to which this will broaden the hearing. Rather than make this a new contention, I will number this as 2-A. It concerns releases of tritium and doses to the population and to the most affected individuals, taking issue with the assumptions in the calculation methods used by DOE as outlined in their EIS. It goes to the heart of the reason for this hearing, and rather than broaden this hearing, it goes to the forefront of issues necessitating this hearing.

CONTENTION 2.A

The doses that DOE and TVA present in the DPE-EIS-0288, are based on assumptions which are unproven and invalid. These include:

(1) It was **assumed that 1 curie of tritium from each tritium producing burnable absorber rod (TPBAR) per year could permeate to the reactor coolant. This is 1 out of a total of 11,573 total curies per rod. This is an unproven assumption, which negates all dose calculations based on this assumption.**

(2) It was **assumed that ground surfaces had no previous deposition of radionuclides. This is an erroneous assumption. Only ground surfaces are mentioned, completely ignoring the disposition of existing radionuclides in rivers and lakes, the source of public drinking water.**

(3) Only 1 year of intake was used to calculate the dose, while tritium production is slated to last 40 years. Retention time in the body is assumed to be 50 years. This ignores the cumulative effect of intake for years 2 through 40 of operation.

(4) Dose calculations are based on adult humans, while fetuses and young children are much more adversely affected by radiation.

(5) It was assumed that over the 40 year operation only two TPBARs could fail in an operating cycle, and release all the tritium generated in the failed TPBARs, 2315 curies in air emissions and 20,853 curies in liquid effluents. These are classified as abnormal events. It is unclear if this is per reactor per cycle, or a total of 2 totally for whole project. No proof is given for the accuracy of this assumption. It is an uncertainty which creates flawed data.

(6) Emergency planning is based on the assumption that people at risk from a

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most severe accident can be evacuated. The evacuation plan is limited to people living with in 10 miles of each reactor.

Even DOE recognized the unreliability of the dose calculations, which are based on assumptions rather than scientifically proven facts. The DOE/EIS - 0288, March, 1999, Volume 1, section C.3.3 **Uncertainties,** page 3-19, second paragraph, "Although the radionuclide composition of source terms (identified as quantities of tritium in the form of tritium oxide released to the environment in a given period, page. C-14, last paragraph) are reasonable estimates, there are uncertainties in the radionuclide inventory and release reactions that affect estimated impacts,"

Uncertainties are more fully described in D-1-2-6, page D-15 paragraph one: "The sequence of analyses performed to generate the radiological and hazardous chemical impacts estimates from normal operation of commercial light water reactor facilities, facility accidents, and overland transportation include: (1) selection of normal operation modes and accident scenarios and their probabilities, (2) estimation of source terms, (3) estimation of environmental transport and uptake of radionuclides and hazardous chemicals, (4) calculation of radiation and chemical doses to exposed individuals, and (5) estimation of health effects. Health effects are presented in terms of latent cancers and latent cancer fatalities. There are uncertainties associated with each of these steps. Uncertainties exist in the way the physical systems being analyzed are represented by the computational models and in the data required to exercise the models."

The last sentence of paragraph 3 is the escape clause "this does not imply that the latent cancer deaths are identifiable to any individual." In other words, the radioactive tritium that triggered the cancer is untraceable to this project. This insures deniability for liability. Birth defects are completely ignored. Damage to the gene pool is not insignificant. By ignoring fetuses and children, the damage to the population is vastly underestimated.

2.A.1 Assumption #1. From DOE/EIS -0288, section 5.2.2.3, page 5-18. "The design objective of the TPBARs is to retain as much tritium as *possible* within the TPBAR. The performance of the tritium 'getter' is such that there is *virtually* no tritium available in the form that could permeate through the TPBAR cladding. However, for the purposes of the EIS it was conservatively ***assumed*** that an average of 1 curie of tritium per TPBAR per year could permeate to the reactor coolant. It was also ***assumed that*** 10% of this tritium could be released to the environment as gaseous emission."

Section C.3.4, page C-19, last paragraph says, "During tritium production, some tritium is ***expected*** to permeate through the TPBARs, leading to an increase in the quantity of tritium in the reactor coolant water system. . (Last sentence) These values are based on the ***assumption*** that about 90 percent of the tritium in the reactor coolant water would be released in the liquid effluent and 10 percent would be released to the atmosphere as tritiated water vapor (air emissions). Table C-7 shows that all of the tritium that is assumed to be released into the coolant water will be released to the atmosphere. ·

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The assumption of 1 curie per rod per year is a hypothesis. The scientific method demands that hypothesize be tested to prove their validity. Only after a hypothesis is tested and proven can it be considered a fact. Rather than being conservative, the selection of a single curie out of 11,584 produced per rod per cycle is a highly unrealistic, and overly optimistic assumption. Where is the scientific proof?

This assumption, however, is the basis for all of DOE's calculations of releases. The test of 32 lead tritium test rods at Watts Bar was an opportunity to actually measure the amount of tritium that was released. I showed in my original contention #2 the scientific methodology that should have been used to actually measure the amount of increase in tritium releases attributable to the irradiation of tritium rods.

Step 1. Monitor the tritium that was released prior to the insertion of the rods.

Step 2. Monitor every escape path for the release of tritium during the test.

Step 3. Subtract the amount that was measured prior to the insertion of the rods, (during a six, or 12 month period) from the amount that was measured for a comparable period during the irradiation of the test rods..

Step 4. Adjust the numbers for an eighteen month cycle. In other words, if the tests was performed for a 9 month period, multiply by 2.

Step 5. Multiply the number arrived at in step 4 by 72, since there are 72 times as many rods anticipated to be irradiated during the production of tritium as there were during the test (32 times 72 equals 2304)..

Step 6. Multiply 2/3 of the number arrived at in Step 5 by 40 to arrive at the amount of tritium that can scientifically be expected to be released from Watts Bar during the 40 year irradiation of 2304 TPBARs in 18 month cycles over a 40 year time frame. This is assuming that the 40 year time frame operation is under the same conditions and with the same rods as were used in the test.

Step 7. Multiply the number arrived at in step 6 by 3 to get the total amount of tritium that would be attributable to using all three reactors, which is what is proposed in DOE/EIS-0288. Section3.2.1, page 3-8, paragraph 4, line 5, states that 6,000 TPBARs will be irradiated for 18 month cycles, and in paragraph 3 on page 3-9, the duration of the irradiation project is expected to last 40 years.

As I also noted in #2, of my original contentions, the rods that were tested were not identical to the ones that are now proposed to be used. DOE/EIS -0288, page 3-2-in section 3.2.1, paragraph 3, line 5 "The TPBARs, as currently designed, are being irradiated at the Watts Bar Nuclear Plant. The final TPBAR design has been completed and is being reviewed by the U.S. Nuclear Regulatory Commission (NRC) (66FR43732)"

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According to section 1.5.1.2, page 1-13 (DOE/EIS-0288) the rods were inserted on September 25, 1997, for an 18 month fuel cycle. Yet the last sentence of paragraph 3, page 3-15 states "The Watts Bar 1 liquid contaminant releases to the environment during *normal operations* are identified in Table 3-4." The table shows: Tritium (curies) -639- TVA, 1998.

Rather than actually using this scientific method, as I outlined in Steps 1-3, to measure the amount of tritium released from Watts Bar that would be attributable to the 32 test rods, DOE used the entire monitored releases for 1998, during which time the 32 test rods were being irradiated, and attributes those total releases for that year to "**normal operation**".

The DOE/EIS listed the 1998 total releases as 639. That number was attributable to 1997, and the 1998 releases were 712, according to a document published after the Oct. 21, 2001 public meeting hosted by TVA, NRC, and DOE. (See attachment 2 of my original contentions, page 2, Table 1.).

2 A. 2 Other assumptions, in addition to the assumption that only 1-curie of tritium per year per rod would be released, are listed on page C-15 & 16 **Calculation Assumptions** , paragraph 6, "Ground surfaces were assumed to have no previous deposition of radionuclides." This is an erroneous assumption. The past operation of Oak Ridge, Browns Ferry, Watts Bar, and Sequoyah have all contributed to deposition of radionuclides onto the land and into the water. Actual measurements should be made instead of relying on assumptions.

Only ground surfaces were mentioned in the above assumption. No mention is given to the assumption of previous radionuclide contamination in the water. The water is so contaminated from releases from Oak Ridge that there are numerous postings warning people not to eat the fish from water downstream from Oak Ridge, where both Watts Bar and Sequoyah are located. In my contention #3, I referenced Steve Sanford's information about the pollution in Kingston Springs' drinking water supply. DOE/EIS-0288 states that releases of tritium will be 90% liquid effluent. To ignore previous deposition of radionuclides in the water, is clear evidence that the resultant dose calculations are invalid.. The DOE/EIS clearly states that synergistic effects were not considered. Good science does not ignore interaction of substances, that when combined may produce results greater than the mere addition of each substance individually.

2.A.3. Further assumption fallacies include paragraph 9, "The inhalation exposure time to the plume was 1 year for the maximally exposed individual and the general population. If the actual operation is to extend over a 40 year period, to only calculate the dose for a 1 year time period is on its face a fallacy. On page C-16, paragraph 2 "The calculated doses were 50-year committed doses from 1 year of intake" I interpret this to mean that the 1 year of intake is assumed to remain in the body for 50 years. Are people assumed to move out of the area after one year of exposure, and a new set of people move in every

year? Unlikely, and unrealistic. Using only 1 year of intake falsifies the resultant dose for the life of the person or the life of the project.

2.A.4. Paragraph 10, page C-16 states that the calculations are based on an **adult human.** It is a scientifically acknowledged fact that embryos are much more likely to be damaged by radionuclides than adult humans. Young children are also at more risks than adults. Rapidly dividing cells, are more vulnerable than adult cells. Dr. Ernest Sternglass will provide testimony on this established scientific fact. . To only consider adult humans invalidates DOE's conclusion that the introduction of additional unmeasured doses of tritium generated by the irradiation 6000 TPBARs every 18 months over a 40 year time frame will do no measurable harm. No identifiable harm is accurate, because the cancers that develop in years to come, or the birth defects in the children of the mothers, or in future generations do not push up little red flags that identify the trigger that mutated the first cell that grew into a cancer of birth defect. Using only adults falsifies the results. Do only adults of non-child bearing age live within a 50 mile radius of Watts Bar and Sequoyah? Of course not, but this is what DOE's calculated dose assumes.

2.A.5. Page C-20, Paragraph 1, line 3. " It was **assumed** that during a 40-year operation, two TPBARs could fail in an operating cycle and all the tritium generated in the failed TPBARs would be released to the reactor coolant system." According to table C-8, this would add 2316 curies to the air and 20,835 curies of tritium to the water. No rational was given why only two TPBARs could, fail, "even though it is unlikely to occur." For each cycle at Watts Bar 2304 TPBARs are to be irradiated for 18 months. For each cycle at Sequoyah, 2256 TPBARS are to be irradiated in each of the two reactors for each cycle. Over a 40 year operation this adds up to 89,400 irradiated rods at Watts Bar. At Sequoyah a total of 60,080 rods would be irradiated in each reactor. This adds up to a grand total of 209,600 rods over the 40 year life of the project. Whether the assumption of 2 failed rods in an operating cycle means just one operating cycle for the 40 year life of the project, or for each cycle for each reactor is unclear. However, the number "2" is an assumption. To quote it as fact is unscientific because it is an unknown quantity. Although the doses are characterized as "conservative, I would call 2 failed rods out of 2304, or 2256, , or 89,400, or 60,080, or 209,600 not conservative at all, but the height of optimism. A better word than assumption would be a "guesstimation." My dear departed Aunt Mel would have said, "Aw Jeannine, they are just telling it like they wish it was." I can find no scientific explanation of why 2 failed rods were chosen. This appears to be an arbitrary number plucked out of a hat. No basis for it or any other assumption has been provided. Past operating experience does not instill confidence that TVA can produce tritium for even 18 months without causing irreparable harm to children, who will breath the air and ingest the water, milk, and food that will be contaminated. Fetuses are even more susceptible than young children. In addition to birth defects, the gene pool can be damaged which will carry the damage on to untold number of

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generations.

2.A.6 In the event of the worst possible accident, in laymen's terms a "Chernobyl" type accident, in nuclear jargon, a "beyond design type accident," it is assumed that the people in a 10 mile radius of the reactor would be evacuated. A story in the Chattanooga Free Press earlier this year stated that 80,000 people live in a 10 mile radius of Sequoyah. The story said that in event of evacuation they would go to any one of 12 schools. The DOE/EIS-0288 , section D.1.3.6 is not so specific. It only says that the population within a 10 mile radius would be evacuated. The wind does not stop blowing at an arbitrary 10 mile boundary. The river does not stop flowing at a 10 mile boundary. The 12 schools may be outside of the 10 mile radius, but what assurance does the public have that they would not be as contaminated at these schools as they would have been at their own homes, We live in a democratic country. Russia could force evacuation. How could you evacuate even the 80,000 people who live in the 10 mile radius of Sequoyah? . An evacuation plan that is limited to a 10 mile radius is too conservative. There is no effective way to protect the people during routine operation, and certainly not during accident conditions. To **assume** that you can evacuate the population at risks is either wishful thinking of just plain stupidity. The only way to protect the health and safety of the general population, the maximally exposed individual, or the workers is for this Board to deny the requested license amendment.

Respectfully submitted this 3rd day of July, 2002,

Jeannine Honicker

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UNITED STATE OF AMERICA
NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD

BEFORE ADMINISTRATIVE JUDGES:

Thomas S. Moore, Chairman
Dr. Peter S. Lam
Dr. Thomas S. Elleman

In the matter of

TENNESSEE VALLEY AUTHORITY	)	Docket Nos. 50-327 OLA
Sequoyah Nuclear Plant Units 1 & 2	)	50-328-OLA, 50-380-OLA
Watts Bar Nuclear Plant, Unit 1	)	ASLBP 02-798-01-OLA

CERTIFICATE OF SERVICE

I hereby certify that copies of Jeannine Honicker's addendum to contention for the OLA hearing for TVA to produce tritium at Sequoyah and Watts Bar Nuclear Plants in the above captioned consolidated proceedings have been served on the following by deposit in the United States mail, first class, on this day, July 3, 2002. They have also been sent electronically to the e mail addresses given below each address on this day, 7/3/02.

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Attn: Rulemaking and Adjudications Staff
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Washington D. C. 20555-0001
(filed an original and 2 conforming copies.)
E Mailed: Patricia Harich <PAH@nrc.gov>.

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