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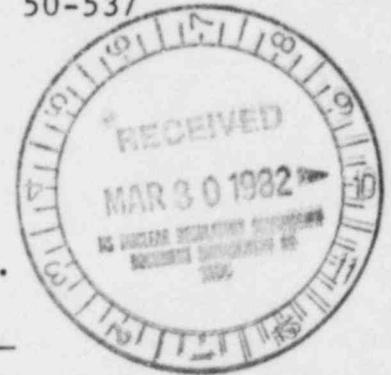
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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In the Matter of)
)
UNITED STATES DEPARTMENT OF ENERGY)
PROJECT MANAGEMENT CORPORATION)
TENNESSEE VALLEY AUTHORITY)
)
(Clinch River Breeder Reactor)
Plant))

Docket No. 50-537



APPLICANTS' RESPONSE TO
NATURAL RESOURCES DEFENSE COUNCIL, INC.
AND THE SIERRA CLUB NINTH
REQUEST TO APPLICANTS FOR ADMISSIONS

Pursuant to 10 CFR § 2.742, and in accordance with the Board's Prehearing Conference Order of February 11, 1982, the Department of Energy and Project Management Corporation, acting for themselves and on behalf of the Tennessee Valley Authority (the Applicants), hereby submit their Responses to Intervenors, Natural Resources Defense Council, Inc. and the Sierra Club, Ninth Request to Applicants for Admissions, dated March 18, 1982.*/

*/ The Applicants' March 29, 1982 Motion for a Protective Order objected to and sought relief from Admissions III 1-24; and IV (Contentions 10(a) and 17) 1 - 10.

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I. Contention 2

1. The assumed frequency of anticipated transient without scram (ATWS) accidents in LWR's is less than once in a thousand reactor years.

The Applicants cannot truthfully admit or deny this for the reason that the Applicants have not performed calculations to determine the frequency of anticipated transient without scram (ATWS) accidents in LWRS. The Applicants admit that the following statement is included in the supplementary information of the NRC proposed rule on standards for the reduction of risk from anticipated transients without SCRAM (ATWS) events for light water-cooled nuclear power plants (Federal Register, Vol. 46 No. 226, page 57522, Nov. 24, 1981):

This experience suggests that the frequency of ATWS accidents is less than or of the order of once in a thousand reactor years.

2. The assumed frequency of anticipated transient without scram (ATWS) accidents in LWR's is on the order of once in a thousand reactor years.

The Applicants cannot truthfully admit or deny this for the reasons that the applicants have not performed calculations to determine the frequency of anticipated

transient without scram (ATWS) accidents in LWRS. The Applicants admit that the following statement is included in the supplementary information of the NRC proposed rule on standards for the reduction of risk from anticipated transients without SCRAM (ATWS) events for light water-cooled nuclear power plants (Federal Register, Vol. 46 No. 226, page 57522, Nov. 24, 1981):

This experience suggests that the frequency of ATWS accidents is less than or of the order of once in a thousand reactor years.

3. With LWR's, there have been several observed precursor events, i.e., faults detected that could have given rise to ATWS events.

The Applicants cannot truthfully admit or deny this for the reason that the Applicants have not performed evaluations to specifically determine if LWR experience shows faults detected which could have given rise to ATWS events. The Applicants admit that the statement is included in the supplementary information of the NRC proposed rule on standards for the reduction of risk from anticipated transients without SCRAM (ATWS) events for light water cooled nuclear power plants (Federal Register, Vol. 46 No. 226, Page 57522, Nov. 24, 1981).

4. The fact that there have been several observed precursor events that could have given rise to ATWS events suggests that the frequency of ATWS accidents, although less than once in a thousand reactor years, may not be very much less.

The Applicants cannot truthfully admit or deny this for the reasons that the Applicants have not performed calculations to determine the frequency of anticipated transient without scram (ATWS) accidents in LWRS. The Applicants admit that the statement is included in the supplementary information of the NRC proposed rule on standards for the reduction of risk from anticipated transients without SCRAM (ATWS) events for light water-cooled nuclear power plants (Federal Register, Vol. 46 No. 226, page 57522, Nov. 24, 1981).

5. There is insufficient actuarial experience with LMFBR's to reasonably indicate that the probability of an ATWS event in the CRBR is less than that in an LWR.

The Applicants deny this statement. There is an extensive base of LMFBR design, construction, and operating experience which has been developed over the last 34 years, both in the U.S. and in other countries, which

is available for use in the safety evaluation of CRERP technology.

6. It would be imprudent to assume for purposes of designing the CRBR to cope with accidents that the probability of an ATWS event in the CRBR is less than the probability of an ATWS event in an LWR.

The Applicants deny this statement.

7. Most studies of the likely causes of serious accidents conclude through probabilistic risk analysis that over 50% of the risk is associated with human failure to perform as intended. This observation includes human errors in design and construction, in maintenance and testing during operation, and, of course, mistakes by operators in response to unusual occurrences.

The Applicants cannot truthfully admit or deny this statement for the reason that there is no specificity regarding the terms "most studies," "likely causes," "serious accidents," and "risks." Absent a definition of what studies, what constitutes likely causes, what serious accidents are, and what risk is, there is no meaningful response that can be given.

8. The NRC has concluded that the reliability of current light water reactor protection systems has not been demonstrated to be adequate and most likely is not adequate.

The Applicants deny this as stated. The Applicants admit that this statement is contained in the descriptive material on the first NRC-proposed rule (the Staff rule) which is one of the three alternatives that the Commission is considering for amending its regulations regarding ATWS. (Federal Register, Vol. 46 No. 226, page 57523, Nov. 24, 1981).

II. Contention 3

1. Reasonable assurance that a proposed site is a suitable location for a reactor of the general size and type proposed by Applicants requires a determination of an exclusion area and a low population zone as defined in 10 CFR § 100.3.

The Applicants can neither admit nor deny this statement since the statement does not call for an admission as to any relevant matter of fact, but calls for a legal conclusion on which the regulations speak for themselves.

2. Determination of an exclusion area requires calculations of dosages to the whole body and selected organs from an assumed radioactive release, i.e., a source term.

The Applicants can neither admit nor deny this statement since the statement does not call for an admission as to any relevant matter of fact, but calls for a legal conclusions on which the regulations speak for themselves.

3. The source term assumed in a site suitability assessment must, in terms of its potential health hazard, not be exceeded by the release from any accident considered credible.

The Applicants can neither admit nor deny this as statement since the statement does not call for an admission as to any relevant matter of fact, but calls for a legal conclusions on which the applicable regulations speak for themselves.

4. For purposes of assessing the suitability of the Clinch River site with reasonable assurance, accidents involving the disruption of the reactor core caused in part by failure to

scram the reactor must be considered credible.

The Applicants can neither admit nor deny this as stated to the extent that the phrase "for purposes of assessing the suitability of the Clinch River site with reasonable assurance" does not call for an admission as to any relevant matter of fact, but calls for a legal conclusion on which the applicable regulations speak for themselves.

The Applicants deny that accidents involving disruption of the reactor core caused in part by failure to ~~scram~~ the reactor must be considered credible.

5. For purposes of assessing the suitability of the Clinch River site with reasonable assurance, it is inappropriate to use the source term used for purposes of assessing the suitability of a light water reactor site.

The Applicants can neither admit nor deny this as stated to the extent that the phrase "for purposes of assessing the suitability of the Clinch River site with reasonable assurance" does not call for an admission as to any relevant matter of fact, but calls for a legal

conclusion on which the applicable regulations speak for themselves.

The Applicants otherwise deny this statement for the reason that the use of the NRC Staff recommended source term is conservative for the CRBRP.

6. For purposes of assessing the suitability of the Clinch River site with reasonable assurance, it is inappropriate to use the source term used for purposes of assessing the suitability of a light water reactor site because of significant differences in designs and potential accident scenarios.

The Applicants can neither admit nor deny this as stated to the extent that the phrase "for purposes of assessing the suitability of the Clinch River site with reasonable assurance" does not call for an admission as to any relevant matter of fact, but calls for a legal conclusion on which the applicable regulations speak for themselves.

The Applicants otherwise deny this statement for the reason that the use of the NRC Staff recommended source term is conservative for the CRBRP.

7. For purposes of assessing the suitability of the Clinch River site with reasonable assurance, the health risks associated with absorbed dose to lung from postulated radioactive releases (i.e., the source term) exceed the health risks associated with absorbed doses to the whole body or thyroids.

The Applicants can neither admit nor deny this as stated to the extent that the phrase "for purposes of assessing the suitability of the Clinch River site with reasonable assurance" does not call for an admission as to any relevant matter of fact, but calls for a legal conclusion on which the applicable regulations speak for themselves.

The Applicant cannot truthfully admit or deny that the health risks associated with absorbed dose to lung from postulated radioactive releases (i.e., the source term) exceed the health risks associated with the absorbed to the whole body or thyroids for the reason that there is no specificity regarding the terms used. Absent a definition of what health risks, what postulated radioactive releases, what doses, and what comparative standard to use, there is no meaningful response which can be given.

8. For purposes of assessing the suitability of the Clinch River site with reasonable assurance, the health risks associated with absorbed dose to bone from postulated radioactive releases (i.e., the source term) exceed the health risks associated with absorbed doses to the whole body or thyroids.

The Applicants can neither admit nor deny this as stated to the extent that the phrase "for purposes of assessing the suitability of the Clinch River site with reasonable assurance" does not call for an admission as to any relevant matter of fact, but calls for a legal conclusion on which the applicable regulations speak for themselves.

The Applicant cannot truthfully admit or deny that the health risks associated with absorbed dose to bone from postulated radioactive releases (i.e., the source term) exceed the health risks associated with the absorbed to the whole body or thyroids for the reason that there is no specificity regarding the terms used. Absent a definition of what health risks, what postulated radioactive releases, what doses, and what comparative standard to use, there is no meaningful response which can be given.

9. For purposes of assessing the suitability of the Clinch River site with reasonable assurance, the health risks associated with absorbed dose to lung from postulated radioactive releases (i.e., the source term) are likely to exceed the health risks associated with absorbed doses to the whole body or thyroids.

The Applicants can neither admit nor deny this as stated to the extent that the phrase "for purposes of assessing the suitability of the Clinch River site with reasonable assurance" does not call for an admission as to any relevant matter of fact, but calls for a legal conclusion on which the applicable regulations speak for themselves.

The Applicant cannot truthfully admit or deny that the health risks associated with absorbed dose to lung from postulated radioactive releases (i.e., the source term) are likely to exceed the health risks associated with the absorbed to the whole body or thyroids for the reason that there is no specificity regarding the terms used. Absent a definition of what health risks, what postulated radioactive releases, what doses, and what comparative standard to use, there is no meaningful response which can be given.

10. For purposes of assessing the suitability of the Clinch River site with reasonable assurance, the health risks associated with absorbed dose to bone from postulated radioactive releases (i.e., the source term) are likely to exceed the health risks associated with absorbed doses to the whole body or thyroids.

The Applicants can neither admit nor deny this as stated to the extent that the phrase "for purposes of assessing the suitability of the Clinch River site with reasonable assurance" does not call for an admission as to any relevant matter of fact, but calls for a legal conclusion on which the applicable regulations speak for themselves.

The Applicant cannot truthfully admit or deny that the health risks associated with absorbed dose to bone from postulated radioactive releases (i.e., the source term) are likely to exceed the health risks associated with the absorbed to the whole body or thyroids for the reason that there is no specificity regarding the terms used. Absent a definition of what health risks, what postulated radioactive releases, what doses, and what

comparative standard to use, there is no meaningful response which can be given.

IV. Contention 8b

1. Almost without exception, detectable mutations have been found to be mildly or strongly deleterious in their effects. (See The Effects on Populations of Exposure to Low Levels of Ionizing Radiation (National Academy Press, 1980) (BEIR III), p. 79.)

The Applicants admit this statement. The statement is very similar to NRDC's Request for Admission on Contention 8a, Nos. 21 and 27 in Docket No. 50-537 (September 16, 1976). However, the statement now describes the mutations as "detectable," in contrast to "induced" in the earlier statement. This now excludes non-detectable mutations, i.e., those with neutral effects.

2. In every species studied by geneticists, the overwhelming majority of mutations that have effects large enough to be readily observed are deleterious. (See The Effects on Populations of Exposure to Low Levels of Ionizing Radiation (National Academy Press, Nov. 1972) (BEIR I), p. 49.)

The Applicants admit this statement.

3. Because radiation-induced transmitted genetic effects have not been unequivocally demonstrated in man, and because of the likelihood that adequate information will not soon be forthcoming, estimation of genetic risk must be based on laboratory animal data. (See BEIR III, supra, pp. 4-5; 73.)

The Applicants admit that there has been no unequivocal demonstration of radiation-induced transmitted genetic effects in man and that examination should be based largely on laboratory animal data. However, human data have been used for estimation of genetic effects resulting from gross chromosomal aberrations (BEIR III, page 5).

4. Any increase in the mutation rate is likely to be harmful to future generations. (See BEIR III, supra, p. 80.)

The Applicants deny this statement as it applies to overall mutation rate. The statement was made at a time when the mutations studied, as dictated by the techniques available, were readily detected and usually deleterious. More recent techniques involving biochemical analysis indicate that many mutations induced are likely to have no detrimental effect to future generations.

5. While genetic risk to humans is based largely on animal studies, for purposes of licensing the Clinch River Reactor, one should assume that any increase in the human mutation rate will be harmful to future generations.

The Applicants can neither admit nor deny this statement to the extent that the phrase "for purposes of licensing the Clinch River Reactor" is not a relevant matter of fact, but calls for a legal conclusion on which the applicable regulations speak for themselves. The Applicants admit that it is prudent to assume that any increase in the human mutation rate will be harmful to future generations.

6. For purposes of licensing the Clinch River Reactor, at low levels of exposure one should assume that the effect of radiation in producing either (1) those genetic disorders which depend on changes in individual genes (gene mutations or small deletions), or (2) those which depend on changes in chromosomes, either in the total number or in the genes arrangement (chromosomal aberrations) will be proportional to dose.

The Applicants can neither admit nor deny this statement to the extent that the phrase "for purposes of

licensing the Clinch River Reactor" is not a relevant matter of fact, but calls for a legal conclusion on which the applicable regulations speak for themselves. The Applicants admit that it is prudent to make the assumptions set forth in the statement. However, in making estimates based on proportionality, the BEIR III Committee introduced a dose-reduction factor based on the fact that the 1 rem dose used in their calculations was the dose over one generation, i.e., at a very low dose rate.

7. It is reasonable to assume that the estimated relative mutation risk for humans exposed to continuous exposure over a large number of generations is 0.02-0.004 per rem (or a doubling dose of 50-250 rems). (See BEIR III, supra. p. 96.)

The Applicants admit this statement.

8. An exposure of one rem received in each generation is estimated to result at genetic equilibrium in an increase of 60-1100 serious genetic disorders per million live-born offspring. (See BEIR III, supra, pp. 5, 96.)

The Applicants admit this statement. However, the frequency of 60-1100 serious genetic disorders must be

taken in the context of the current incidence for such disorders of 107,000 per million liveborn.

9. It is reasonable to assume that the BEIR III estimate of 60-1100 cases per million live births for 1 rem per person per generation underestimates the total of all genetic and chromosomal diseases or defects and that the number of cases may be in the range of 191 to more than 20,000. (See John W. Gofman, Radiation and Human Health, Sierra Club Books, 1981, p. 849.)

The Applicants deny this statement. The frequencies estimated by BEIR III, based on available knowledge, include a maximal estimate (1150) and not an underestimate.

10. It is reasonable to assume that in the first generation one rem of parental exposure before conception throughout the general population will result in an increase of 5-65 additional serious genetic disorders per million live-born offspring. (See BEIR III, supra, p. 97.)

The Applicants admit this statement, but as in 8, desire that the frequency of 5-65 additional serious genetic disorders per million liveborn offspring (as

the result of 1 rem of parental exposure throughout the population) be taken in the context of the current incidence of 10,000 per million liveborn offspring.

11. It is reasonable to assume that the BEIR III estimate of 5-65 additional cases of serious genetic disorders underestimates the total of all genetic and chromosomal diseases or defects and that the number of cases may be as much as 20 times higher. (See Gofman, supra, p. 849.)

The Applicants deny this statement. The estimates of 65 additional cases of serious genetic disorders was a maximal estimate, based on available data, and not an underestimate.

12. Some experts in radiation health effects research believe that BEIR III underestimates the genetic risks associated with radiation exposure. (See Gofman, supra, p. 849.)

The Applicants admit that this is Dr. Gofman's opinion. The Applicants otherwise deny this statement.

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of)
DEPARTMENT OF ENERGY)
PROJECT MANAGEMENT CORPORATION)
TENNESSEE VALLEY AUTHORITY)

DOCKET NO. 50-537

AFFIDAVIT OF Dr. Paul W. Dickson, Jr.

being duly sworn, deposes and says as follows:

1. That he is employed as Technical Director, CRBRP
Advanced Reactors Division - Oak Ridge Site

and that he is duly authorized to answer admissions numbered
I (1-8) and II (1-10) in the Ninth Set.

2. That the above-mentioned and attached answers are true and
correct to the best of his knowledge and belief.

Paul W. Dickson, Jr.
SIGNATURE

SUBSCRIBED and SWORN to before me this 26th day of
March, 1982.

One H. Minor
Notary Public

My commission expires My Commission Expires April 19 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of
U. S. ENERGY RESEARCH AND DEVELOPMENT
ADMINISTRATION
PROJECT MANAGEMENT CORPORATION and
TENNESSEE VALLEY AUTHORITY

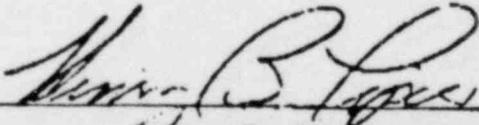
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AFFIDAVIT OF HENRY B. PIPER

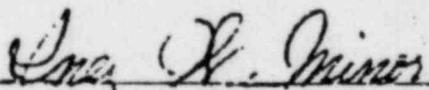
Henry B. Piper, being duly sworn, deposes and says as follows:

1. That he is employed as Chief of the Licensing Branch of the CRBRP/PO, and that he is duly authorized to execute the responses on behalf of the Applicants to the NRDC's March 18, 1982, request to the Applicants for admission concerning Contention 8b.

2. That the above-mentioned and attached responses to NRDC's request for admissions are true and correct to the best of his knowledge and belief.


Henry B. Piper

SUBSCRIBED and SWORN to before me this 29th day of March, 1982.


Notary Public

My Commission Expires:
My Commission Expires April 23, 1984

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U. S. Nuclear Regulatory Commission
Washington, D. C. 20545

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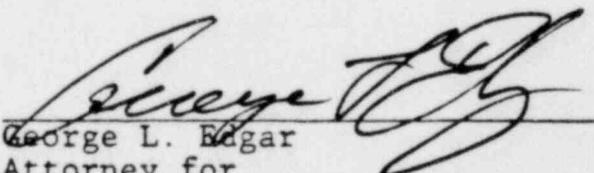
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DATED: March 29, 1982

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