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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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 C.F.R. § 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.^{1/}

1/ Applicants are herewith responding to Admissions 1-10, 12, 15-19, and 21. No responses are provided for Admissions 11, 13-14, 22-24 in accordance with the rulings of the Licensing Board at the Prehearing Conference on April 5-6, 1982 (See Board Order, April 14, 1982 at 14).

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CONTENTIONS 8(a) and 22

1. The admonition that exposures to ionizing radiation should be maintained as low as reasonably achievable (ALARA) is a long-standing tenet of the health physics community and organizations and agencies responsible for recommending and establishing radiation protection criteria.

ANSWER:

The Applicants can admit this statement.

2. The ALARA principal was previously referred to as the ALAP principle, where ALAP stands for "as low as practicable."

ANSWER:

Applicants admit this statement.

3. "As low as reasonably achievable," and "as low as practicable" are two of several variations in statements of the same principle.

ANSWER:

The Applicants can neither admit nor deny this statement for the reason that there is no specificity regarding the term "several variations." Absent a definition or specification of the "several variations" of which ALARA and

ALAP - but two, there is no meaningful response that can be given. Applicants admit that ALAP and ALARA are two statements of the same principle.

4. There is no philosophical difference in terms of the intent of the admonition between "as low as reasonably achievable," and "as low as practicable."

ANSWER:

Applicants admit that there is no philosophical difference between the intent of the ALARA and ALAP principles.

5. The National Council on Radiation Protection and Measurements (NCRP), formerly the National Committee on Radiation Protection, has had a long-standing philosophy that radiation exposures from whatever source should be as low as practicable. (See Handbook 59, "Permissible Dose from External Sources of Ionizing Radiation," U.S. Department of Commerce, September 24, 1954, p. 2.)

ANSWER:

Applicants admit this statement. HB 59 was the first NCRP expression of "as low as practicable".

6. The radiation protection principle that radiation exposures from whatever source should be maintained as low as reasonably achievable or, formerly, as low as

practicable, has been a basic tenet of the National Council on Radiation Protection and Measurements (NCRP), formerly the National Committee on Radiation Protection, since the late 1940s.^{2/}

ANSWER:

Applicants admit this statement. This principle was discussed by the NCRP in the late 1940s.

7. The ALAP philosophy was first published by the ICRP circa 1953.

ANSWER:

Applicants deny this statement. The first official publication of the philosophy (but not the terminology) was in a report by the ICRP in 1951. (NBS Handbook 42). On page 2 of this document they state: "... Nevertheless in view of the unsatisfactory nature of much of the evidence on which our judgments must be based, coupled with the knowledge that certain radiation effects are irreversible and cumulative, it is strongly recommended that every effort be made to reduce exposure to all types of ionizing radiations to the lowest possible level."

^{2/} This admission is based on a private communication between Lauriston S. Taylor and Thomas B. Cochran.

8. The name of the principle was changed from ALAP to ALARA in ICRP publication 22 (circa 1973).

ANSWER:

Applicants admit this statement.

9. The ALARA (or ALAP) principle was and is based on the theory that any dose of ionizing radiation, no matter how small, may produce some genetic or somatic damage and thus it is considered wise to avoid all unnecessary exposure to radionuclides. (See Handbook 69, "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure," U.S. Department of Commerce, June 5, 1959, p. 4.)

ANSWER:

Applicants deny this statement. In the reference given in HP 69, (p. 4), the following statement is made: "according to one theory, any dose of ionizing radiation, no matter how small, may produce some genetic or somatic damage; and thus, it is considered wise to avoid all unnecessary exposure to radionuclides." (Emphasis added). However, the quote in 7, above, indicates the strong influence of uncertainty in knowledge. This is reinforced by the statement in HB 59, issued in 1954 (p. 3). "The recommendations are based on presently available information and cannot be regarded as

permanent. For this reason and on general grounds, it is strongly recommended that exposure to radiation be kept at the lowest practicable level in all cases." Thus, it is clear that the uncertainties in information available played a strong role in the establishment of the concept of "as low as practicable". We admit, however, that the present use of ALARA is based on the linear no-threshold assumption.

10. The ALARA (or ALAP) concept is a concise summary of the intention to encourage protection practices that are better than any prescribed minimal level, which is the basic criterion for all cases in which a non-threshold dose-effect relationship either exists or has been assumed. (See NCRP Report No. 39, "Basic Radiation Protection Criteria," January 15, 1981.)

ANSWER:

Applicants admit this statement.

12. The original concept of ALARA (or ALAP) was based on the view that, when maximum permissible exposure limits were established by government agencies, the industry should not be encouraged to push exposures up to these levels but should instead be encouraged to keep well below them.

ANSWER:

Applicants deny this statement. See Applicants' answers to Admissions 7 and 9.

15. The 10 C.F.R. § 20.1(c) ALARA requirement derives directly from the guidance of the Federal Radiation Council (FRC) as published in its Report No. 1, "Background Material for the Development Radiation Protection Standards," May 13, 1960, at ¶ 5.8, p. 28.

ANSWER:

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 as to the derivation of the cited regulation and on which the regulation speaks for itself.

16. The Federal Radiation Council (FRC) recognized that there was a possibility of biological damage to the individual or his progeny from the Radiation Protection Guide values of 0.5 rem per year for an individual in the general population and 5 rem per year for occupational exposure.

ANSWER:

Applicants admit this statement.

17. The FRP recommended that radiation exposures should always be maintained at the minimum practicable level.

ANSWER:

Applicants deny this statement. The FRC definition of the radiation protection guide is " ... the radiation dose which should not be exceeded without careful consideration of the reasons for doing so; every effort should be made to encourage the maintenance of radiation doses as far below this guide as practicable."

18. In adopting the ALAP principle, the Federal Radiation Council was endorsing the recommendations of the NCRP, which had previously established ALAP as a basic tenet of radiation protection.

ANSWER:

Applicants can neither admit nor deny this statement because the FRC in several places in its recommendations diverged from the NCRP and ICRP.

19. The recommendations of the NCRP with regard to maximum permissible radiation exposure to persons outside of controlled areas and attributable to the operation within the controlled areas were derived primarily for the purpose of keeping the average doses to the whole

population as low as reasonably possible. (See Handbook 59, supra, p. 5.)

ANSWER:

Applicants deny this statement. The statement given here was published in 1957. In 1971 (NCRP Report 39, pp. 75 and 97), the NCRP made several revisions to this statement: "Because of the uncertainties in implied degree of effect at this level, the NCRP strongly advocates maintenance of the lowest practicable level. . . ." Also, ". . . the two limits have been numerically equated here by extending the organs of interest from the gonads to the whole body. It is expected that this will be a practical simplification, essentially requiring only one calculation of average population dose in most instances. It is also expected that the dose limit of 0.5 rem (500 mRem) per year for any critical organ of an individual member of the public, combined with the average population dose limit of 0.17 rem (170 mRem) per year for the critical organs, will have the effect of controlling the actual population exposures well below the stipulated limits." Thus, rather than a primary reason it now seems to be a secondary reason.

21. If unnecessary exposure of the general population to ionizing radiation is not avoided when it is practicable to do so, the general population is being subjected to an undue risk to its health and safety.

ANSWER:

Applicants deny this statement. NCRP Report 39 discussed this point on page 64. "Ultimately, realistic interpretation in various applications derives from public understanding of, and eventual approbation of, practices developed from recommendations of responsible technical bodies. In particular, it is believed that while exposures of workers and the general population should be kept to the lowest practicable level at all times, the presently permitted exposures represent a level of risk so small compared with other hazards of life, and so well offset by perceptible benefits, that such approbation will be achieved when the informed public review process is completed." Thus, the NCRP appears to feel that even exposures at the maximum limit do not constitute an "undue risk to its health and safety."

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of

U. S. ENERGY RESEARCH AND DEVELOPMENT
ADMINISTRATION

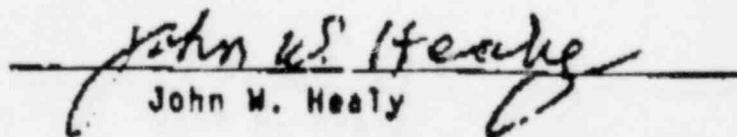
PROJECT MANAGEMENT CORPORATION and
TENNESSEE VALLEY AUTHORITY

AFFIDAVIT OF JOHN W. HEALY

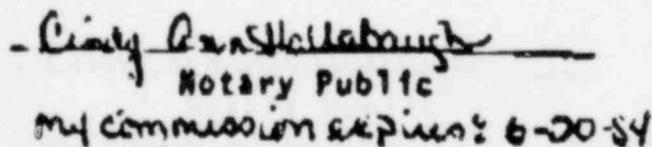
John W. Healy, being duly sworn, deposes and says as follows:

1. That he is employed as a staff member, Health Division, Los Alamos National Laboratory, and that he is duly authorized to execute the response on behalf of the Applicants to the NRDC's and the Sierra Club's request to Applicants for Admissions B(a) and 22, dated March 18, 1982.

2. That the above-mentioned and attached response to NRDC's Interrogatory is true and correct to the best of his knowledge and belief.


John W. Healy

SUBSCRIBED and SWORN to before me
this 13th day of April, 1982.


Cindy Ann Hollabaugh
Notary Public
my commission expires: 6-20-84

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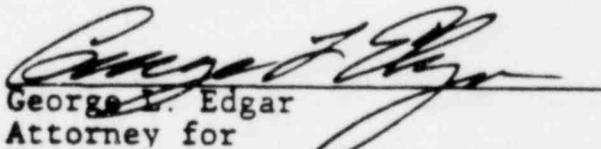
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DATED: April 20, 1982

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