APR 30 1962

Clifford K. Beck
Deputy Director, REG

K. E. Baker, P. D. Anderson, R. Waterfield
Division of Licensing and Regulation

CONCERNING A STATEMENT BY MR. VANN TO THE JCAE WITH RESPECT TO REACTOR SITING CRITERIA

In response to your request, the recent testimony of Mr. Vann before the Joint Committee on Atomic Energy, April 1962, has been reviewed. It may also be of interest to you to know that his premises have been published in Nucleonics Week Vol. 3, No. 12, March 22, 1962. We see a basic danger in the misinterpretation of the siting guides as presented by Mr. Vann which should be corrected. At your suggestion, a statement reflecting our views has been prepared in the event further comment were requested for the record of these hearings. It appears that no request will be made at this time but because we feel that the issue is important, the following comments are being transmitted for possible future use. We feel that release of our comments to the JCAE is necessary at this time to forestall future misinterpretations of the siting guides.

After reviewing the locations of pressurized water cooled reactors approved or about to be approved for construction and/or operation, it was found that the various distance requirements (exclusion, low population, and population center distances) could be approximated by formulae based upon an assumed model for fission product release, leak rate, dispersion, and other parameters. Using such a model, one could correlate the various distance requirements with a calculated direct gamma dose from fission products within the reactor building or with calculated doses to critical body organs based on inhalation of fission products for specified periods of time. The controlling dose by use of the assumed model was dependent upon the power level of the reactor and the distance to the receptor. These formulae are based upon an assumed model and assumed parameters which may or may not be valid for a specific reactor system for a specific accident. Generally, the selected values chosen for the parameters are thought to be conservative for most accidents (i.e. overestimate distance requirements) it is conceivable that they might be nonconservative for others. Requirements for low population and population center distances by use of these

OFFICE ▶						
SURNAME ▶						
DATE ▶						

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

A1313

formulae are related to calculated thyroid doses using a specific model and certain assumed parameters. One could relate these distances to calculated lung doses or doses to other critical organs, if a slightly different model were assumed or different parameters selected. Again it should be recognized that the "rule of thumb" formulae are intended only to reflect current siting practices and to provide initial guidance on distance requirements for reactor sites. An analysis using these formulae should not be considered to be identical with the detailed hazard study for a specific reactor. Special engineering features, operating methods, and other characteristics may modify the overall hazard evaluation for any specific reactor system.

Mr. Vann has suggested that great monetary savings could be made in reactor power plants through siting requirements if the controlling radioisotope, I-131, in this "rule of thumb" method could be retained by an engineering device. In regard to this statement, several pertinent factors have not been analyzed:

1. The statement that iodines are easily trapped for the environment to be encountered subsequent to a nuclear excursion is very questionable.
2. The gross fission product activity released to the atmosphere may be as important or more important a dose consideration than the iodines, depending on the assumed model of release and dispersion.
3. The gross fission product activity released to the containment vessel could increase the exclusion distance through the direct gamma dose so that present distance requirements could not be significantly reduced by removing the inhalation hazard, again depending on the assumed model and parameters.
4. The greatest gain to be made is perhaps in proving the reliability of containment devices and systems. The possibility remains, however remote, that the containment shell could be breached-in which case greater doses could result than assumed in the present model.
5. Similar gains may be made in determining intrinsic properties of given reactor systems, i.e., limiting shutdown mechanism, upper limits to fission product release mechanisms, etc.
6. Formulae being examined are meant only as guides which reflect current siting practices and should not be interpreted as descriptive of all possible controlling hazards.

OFFICE ▶						
SURNAME ▶						
DATE ▶						

APR 30 1962

Further discussion of pertinent factors and assumptions used in the reactor siting formulas can be obtained from the technical document, "Calculation of Distance Factors for Power and Test Reactor Sites," TID-14844.

cc: K. Lowenstein
E. Case
J. DiNunno
R. Waterfield
R. Baker
F. Anderson

OFFICE ▶	SPB:DL&R	SPB:DL&R	SEB:DL&R	RSS:DL&R		
SURNAME ▶	FAnderson:db	RBaker	RWaterfield	JDiNunno		
DATE ▶	4/30/62	4/ /62	4/ /62	4/ /62		

APR 2 5 1962

Mr. Gerald Charnoff
Legal Projects Manager
Atomic Industrial Forum, Inc.
850 Third Avenue
New York 22, New York

Dear Gerry:

I really enjoyed meeting with you too last week. I hope that in paying for your lunch I did not put you in the position which the Atomic Industrial Forum would regard as being a "conflict of interest."

I am pleased to say that your eagle eye for misplaced or missing commas is still effective. I do not know whether there is still time to revise paragraph (b) or, put a comma before "which", but if there is time we shall certainly do it. I appreciate your suggestion and take pleasure that this was the only thing the Forum (I assume your letter represented the official views of the Forum) has to say about the site criteria.

I regret that we will not have an opportunity to give you an appropriate credit in a preface to the TID.

Cordially,

Original signed
by R. Lowenstein

Robert Lowenstein, Director
Division of Licensing & Regulation

OFFICE ▶	DL&R					
SURNAME ▶	RLowenstein:aw					
DATE ▶	4/24/62					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

OPTIONAL FORM NO. 10
5010-104

UNITED STATES GOVERNMENT

Memorandum

TO : Files ✓ DATE: April 13, 1962

L-P Roy Huard

FROM : L. P. R. Huard, Chief, Administrative Branch
Division of Licensing and Regulation

SUBJECT: FEDERAL REGISTER NOTICE

Description: Title 10, Chapter 1, Part 100
Reactor Site Criteria

Citation: 27 FR 3509 Doc. 62-3523

Filing Date: April 11, 1962

Publication Date: April 12, 1962

Action Date: Effective 30 days after publication.

cc: Chrono File

L. P. R. Huard