

Minutes  
of  
ENVIRONMENTAL SUBCOMMITTEE

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

held on  
August 23, 1960

at  
Washington, D. C.

~~Col Stratton~~ 016

ACRS Office  
copy

Orig to CRM 9/20  
copies (at 9/22  
meeting) to:

- WPC
- FG
- KRO
- LS
- AW
- CW

F/27

**ATTENDANCE**

**ACRS:**

**C. R. McCullough, Chairman**

**W. P. Conner**

**F. Gifford**

**K. R. Osborn**

**L. Silverman**

**A. Wolman**

**R. C. Stratton**

**J. J. Fitzgerald, Consultant**

**J. B. Graham**

**R. F. Fraley**

**AEC Staff:**

**C. K. Beck**

**J. Lieberman**

**USWB:**

**D. Pack**

DRAFT 9/20/60 JBG:LSB

Dr. McCullough outlined the scope of the meeting and asked Dr. Beck to summarize his revised criteria for site selection (draft #4, 8/5/60) including some statement of the underlying philosophy.

In his early remarks Dr. Beck stressed that his draft criteria did not explicitly deal with the probabilities of accidents but it is implied that these probabilities are very low. He then defined the following terms which, for convenience, are set forth below:

Exclusion Area -- An area whose radius is not less than the distance at which total radiation doses received by an individual fully exposed for two hours to the radioactive consequences of the maximum credible accident would be above 25 R (or equivalent). The area should be under the full control of the applicant. Residents subject to ready evacuation are allowed.

Evacuation Area -- An area whose radius is not less than the distance at which total radiation doses received by an individual fully exposed for the entire maximum credible accident would be above 25 R (or equivalent). Total population not to exceed 10,000 people and no more than 2,000 in any 45° sector.

City Distance -- Distance from reactor to nearest fringe of high density population of a substantial city (above 10,000) which must not be less than distance at which total radiation doses received by a person exposed for the entire maximum credible

accident would be above 10 R or equivalent. The real basis, however, for this criterion is an uncontained "puff" release resulting in a LD-50 dose at the city boundary.

Dr. Beck observed that the meteorological parameters used in his tabulation of existing and proposed reactors were reviewed with USWB. Don Pack pointed out that this was so but there had been some slippage in the values given for U.S. Average conditions (see Item 6, Appendix A).

The criteria presented are intended to be applied to pressurized water and boiling water power reactors. Mr. Osborn thought that this might be unfair to the pressurized water reactors. Dr. Beck believes that the probabilities of <sup>major</sup> accidents in either type is sufficiently low that one can neglect the differences in the numbers themselves.

Dr. Conner asked if Dr. Beck's criteria considered genetic damage and the reply was that it was considered but at large distances (low doses) all reactors look the same. Also, the Sutton equation is not valid for these large distances. Dr. Conner expressed the view that the life shortening phenomena should also be considered.

Dr. Gifford observed that there are two bad things the criteria might do: the first would be to allow a reactor to be sited too close to population, and the second would be to exclude reactors which should be allowed to locate at a lesser distance from population.

Dr. McCullough reviewed the concept of equivalent dose on the basis of radiation induced leukemias.

20	leukemias	due	to	$10^{+6}$	man	rem	(whole	body)
5	"	"	"	"	"	"	"	(thyroid)
10	"	"	"	"	"	"	"	(bone dose)

In executive session it was agreed that the ACRS should take a strong position to the effect that quantitative criteria cannot be written at this time. There was sentiment in favor of describing the philosophy which has been used by the Committee in arriving at safety judgments.