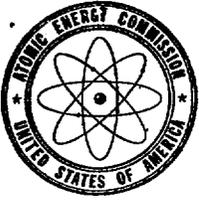


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UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

AUG 12 1960

Dr. Leslie Silverman
Chairman, Advisory Committee
on Reactor Safeguards
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Dr. Silverman:

There are enclosed herewith for the use of the Environmental Subcommittee of the ACRS five copies of a draft of site criteria for reactors. This is another version of tentative site criteria, an earlier draft of which was furnished the Committee in the early spring of this year.

You will recognize that this is a draft working paper for limited distribution only and that a considerable amount of work needs to be done before this could be considered to be in a final form.

Sincerely yours,

Clifford K. Beck
Clifford K. Beck, Chief
Hazards Evaluation Branch
Division of Licensing and
Regulation

Enclosure:
Draft of site criteria (5 cys)

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August 9, 1960

Notes pertinent to discussion with Frank Gifford on August 8, 1960, particularly in reviewing Draft III by Dr. Beck, dated July 7, 1960, on site criteria for reactors and the tabulation.

These two documents were given to Dr. Gifford by Dr. Beck at the last ACRS meeting. The following comments are numbered in accordance with the draft (see attached):

I. Applicable Circumstances and Conditions

1. The concept of being able to predict an accident is still retained especially in (b) when it is said "that, for all credible accidents, and upper limit of fission product release to the environment can be established."
2. External containment vessels are mentioned with a hedge that they may not be required if (a) and (b) in paragraph I. 1. can be demonstrated.
3. The maximum credible accident concept is retained with a statement that it "may provide the primary basis for consideration of the site criteria" with the provisions:
 - "(a) that no credible accident would breach the structure or cause a significant increase in its leakage rate, and
 - "(b) that an upper limit to the rate and duration of fission product leakage to the environment can be established."
4. Specifically mentions pressurized and boiling water reactors and also shows release within the containment of 100% of noble gases, 50% Iodines, and 1% of the solid fission product inventory. This is also tied to a rupture of a major pipe. Nothing is said about rupture of a pressure vessel. See also about burden of proof.
5. Atmospheric dispersion corresponds to the least favorable 20% weather conditions representative of the region. Refers to Appendix "A" which gives a listing of parameters broken down to seven different kinds of locations. The seventh one, called "Special Circumstances," is intended to cover Southern California, etc. It is understood that these are the numbers supplied by Dr. Pack.

II. The Criteria

1. Gamma shine is based on 25 r in two hours for the exclusion area.
2. The evacuation area is based upon a dose about 25 r for an individual exposed for the entire maximum credible accident. It is stated later that the evacuation must be accomplished "in a short time." Note, however, that under this criterion no one can get over 25 r in this zone.
3. City Distance -- This starts where the maximum credible accident gives 25 r and goes to where the doses are 10 r. This means that persons, no matter how many, from this distance may receive 10 r or less. It should be noted that these three concepts do give credit to the man-rem idea in a crude sort of way.
4. Is one-half mile from an earthquake fault sufficient?
5. Direct liquid contamination of streams is a bit vague; as also is "serious contamination of the hydrosphere."
6. This says that Part 20 must be followed.
7. Hedges.
8. Hedges.
9. Says forthrightly that engineering features can balance for environmental factors. This opens the door to situations like Jamestown.
10. This opens the door still wider for relaxation of specifications with the hedge of the burden of proof on the applicant.

III. Definitions

1. There is a possibility of permitting use of the exclusion area without specific approval by the AEC.
2. Evacuation Area -- There is no demonstration that people can be evacuated in a short time. What is "a short time"? It should also be pointed out that the limiting problem turns out to be iodine and it should be remembered that iodine decays with an 8-day half-life. Is chemically active, particularly is absorbed on particulate matter. Most people can live and function without a thyroid gland by the use of

medicine. It should be pointed out that the strontium hazard is a particulate one. This means that if evacuation is not possible, the situation can be very materially ameliorated by the use of gas masks or filters. It should be noted that 30° is a large sector. Gifford would like to have 22-1/2° or 11-1/4°.

3. The nearest high density population is not defined, and the nearest fringe is likewise not defined.
4. The concept of maximum credible accident is here. This should be rewritten in terms of some arbitrary release because experience has shown that people tailor maximum credible accident so as to get the results desired.

Table Tabulation

Note that the release to the containment is 100% noble gases, 50% iodines and 1% of the solids in the written criteria is used. Note also that the leakage is taken uniformly at 0.1% per day. Note also that 1,000 rems to the thyroid in a two-hour exposure is taken as equivalent to 24 r body dose. Nothing is said about equivalent bone dose. Note also that (5) on the table deals with 250 r whole body dose from a puff release of 20% of fission products.

Other comments are that Yankee is given valley-type meteorology. It is found that the evacuation distance is inadequate because 40,000 people are involved in the 13.7-mile radius. This obviously includes North Adams, which is 9 miles away. It is not clear whether or not valley meteorology is used to calculate this 13.7 miles. There is some question that valley meteorology is applicable in the North Adams direction, since the pollutants would have to go over a ridge or a hill by a consequent better mixing. It was also not clear whether this table deals with a number of people in calculating evacuation distance or whether it deals with the total of people in the radius. It is not clear what is meant by "average inversion meteorology" versus "typical inversion meteorology."

In the case of Consolidated Edison, the city distance table shows that there are 18,000 people in a 14-mile distance, whereas in the evacuation there are 45,000 people in 7.9 miles. Is this because the plume was taken in one case and radius another?

In the case of Pathfinder, there is shown 65,000 people within 6.9 miles. Is this correct?

The most significant comment is that by this table only Dresden, Vallyctios (VBWR), Peach Bottom, Consumers, Parr, Hallam, ICBWR,

NASA, and Elk River are completely acceptable. Those having one "no" are Pathfinder and PRDC. Those having two "noes" are Piqua, Point Loma, Humboldt Bay, Jamestown and PWR. Those having three "noes" are Consolidated Edison and Yankee. Note that this does not correlate well with the man-rem classifications which Gifford has worked up.