

05/22/59

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

Dear Dr. McCullough:

Transmitted herewith for information of the Committee are three copies of the notice of proposed rule making regarding site evaluations for nuclear power and test reactors. This notice is being published in the Federal Register on May 23, 1959 inviting public comment on the described site evaluation factors and on the development of definitive criteria which might be incorporated in the Commission's regulations.

We plan to discuss with the Committee the results of our review of the comments received.

Sincerely yours,

(Signed) H. L. Price
Eberhard L. Price, Director
Division of Licensing and
Regulation

Enclosure:
Notice of Rule Making (in trip.)

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Additional copies for distribution to the members of the Committee are enclosed.

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TITLE 10 - ATOMIC ENERGY

CHAPTER I - ATOMIC ENERGY COMMISSION

NOTICE OF PROPOSED RULE MAKING

(Published in the Federal Register on May 23, 1959)

The Commission is considering the formulation of an amendment to its regulations to state site criteria for evaluation of proposed sites for nuclear power and test reactors and is publishing for comment safety factors which might be a basis for the development of site criteria.

In view of the complex nature of the environment, the wide variation in environmental conditions from one location to another and the variations in reactor characteristics and associated protection which can be engineered into a reactor facility, definitive criteria for general application to the siting problems have not been set forth.

All interested persons are invited to submit comments and suggestions on the following site factors and on development of definitive criteria for evaluation of sites for power and test reactors which might be incorporated in the Commission's regulations. All interested persons who desire to submit written comments and suggestions should send them to the U. S. Atomic Energy Commission, Washington 25, D. C., Attention: Division of Licensing and Regulation within 30 days after publication of this notice in the Federal Register.

Factors Considered in Site Evaluation for Power and Test Reactors

a. General. The construction of a proposed power or test reactor facility at a proposed site will be approved if analysis of the site in relation to the hazards associated with the facility gives reasonable assurance that the potential radioactive effluents therefrom, as a result of normal operation or the occurrence of any credible accident, will not create undue hazard to the health and safety of the public.

There are wide possible variations in reactor characteristics and protective aspects of such facilities which affect the characteristics that otherwise might be required of the site. However, the following

factors are used by the Commission as guides in the evaluation of sites for power and test reactors. The fact that a particular site may be deemed acceptable for a proposed reactor facility when evaluated in the early phases of the project, does not determine that the reactor will eventually be given operating approval, or indicate what limitations on operation may be imposed. Operating approvals depend on detailed review of design, construction and operating procedures at the final construction stages.

b. Exclusion Distance Around Power and Test Reactors. Each power and test reactor should be surrounded by an exclusion area under the complete control of the licensee. The size of this exclusion area will depend upon many factors including among other things reactor power level, design features and containment, and site characteristics. The power level of the reactor alone does not determine the size of the exclusion area. For any power or test reactor, a minimum radius on the order of one-quarter mile will usually be found necessary. For large power reactors a minimum exclusion radius on the order of one-half to three-quarter miles may be required. Test reactors may require a larger exclusion area than power reactors of the same power.

c. Population Density in Surrounding Areas. Power and test reactors should be so located that the population density in surrounding areas, outside the exclusion zone, is small. It is usually desirable that the reactor should be several miles distant from the nearest town or city and for large reactors a distance of 10 to 20 miles from large cities. Where there is a prevailing wind direction it is usually desirable to avoid locating a power or test reactor within several miles upwind from centers of population. Nearness of the reactor to air fields, arterial highways and factories is discouraged.

d. Meteorological Considerations. The site meteorology is important in evaluating the degree of vulnerability of surrounding areas to the release of air-borne radioactivity to the environment. Capabilities of the atmosphere for diffusion and dispersion of air-borne release are considered in assessing the vulnerability to risk of the area surrounding the site. Thus a high probability of good diffusion conditions and a wind direction pattern away from vulnerable areas during periods of slow diffusion would enhance the suitability of the site. If the site is in a region noted for hurricanes or tornadoes, the design of the facility must include safeguards which would prevent significant radioactivity releases should these events occur.

e. Seismological Considerations. The earthquake history of the area in which the reactor is to be located is important. The magnitude and frequency of seismic disturbances to be expected determine the specifications which must be met in design and construction of the facility and its protective components. A site should not be located on a fault.

f. Hydrology and Geology. The hydrology and geology of a site should be favorable for the management of the liquid and solid effluents (including possible leaks from the process equipment). Deposits of relatively impermeable soils over ground water courses are desirable because they offer varying degrees of protection to the ground waters depending on the depth of the soils, their permeability, and their capacities for removing and retaining the noxious components of the effluents. The hydrology of the ground waters is important in assessing the effect that travel time may have on the contaminants which might accidentally reach them to the point of their nearest usage. Site drainage and surface water hydrology is important in determining the vulnerability of surface water courses to radioactive contamination. The characteristics and usage of the water courses indicate the degree of risk involved and determine safety precautions that must be observed at the facility in effluent control and management. The hydrology of the surface water course and its physical, chemical and biological characteristics are important factors in evaluating the degree of risk involved.

g. Interrelation of Factors. All of the factors described in paragraphs b. through f. of this section are interrelated and dictate in varying degrees the engineered protective devices for the particular nuclear facility under consideration, and the dependence which can be placed on such devices. It is necessary to analyze each of the environmental factors to ascertain the character of protection it might afford for operation of the proposed facility or the kind of restrictions it might impose on the proposed design and operation.