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

MAR 19 1959

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

Dear Dr. McCullough:

Transmitted herewith are 16 copies of the Preliminary Draft of Proposed Site Criteria for comments of the Advisory Committee on Reactor Safeguards. This draft has been revised in accordance with the changes discussed with the Committee at the meeting on March 14, 1959.

As indicated in our discussion at the meeting we plan to seek approval of the Commission to publish this draft in the Federal Register at an early date.

The purpose of obtaining approval of the Commission to publish this draft in the Federal Register is to invite comments from the public on the contents of the draft. It is not intended to request the Commission to adopt the Proposed Site Criteria at this time.

In the Saturday afternoon discussion with the Committee it was suggested that the revised draft be circulated to Committee members for comment. It would be appreciated if we could receive these comments within about ten days to two weeks.

Before any criteria are formally adopted by the Commission we will bring the matter back to the Committee for review.

Sincerely,

H. L. Price

Harold L. Price, Director
Division of Licensing and
Regulation

Enclosure:
Draft (16 cys.)

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PRELIMINARY DRAFT OF PROPOSED SITE CRITERIA

50.46 Additional Criteria for Construction Permits - Site Considerations

a. General. The construction of a proposed nuclear facility at a particular site will be approved if analysis of the site in relation to the hazards associated with the facility give a 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.

It is not reasonable to establish rigid, quantitative specifications which must be satisfied for a reactor site to be approved. There are wide possible variations in reactor characteristics and protective aspects of facilities which affect the characteristics that otherwise might be required of the site. However, the following criteria are utilized by the Commission as guides to the evaluation of sites for power and test reactors. The possibility is not excluded of deviating somewhat from these criteria, in the direction of either more or less restrictive specifications, if particular features of any facility or site should so dictate. The fact that site characteristics are acceptable at a particular site does not determine that ultimate operation of a particular reactor at that site will be permitted. Final approval of operation depends on careful review of design, construction and operating procedures.

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 reactor owner. The size of this exclusion area will depend upon many

The fact that a particular site may be deemed acceptable for a proposed reactor facility volume evaluation in the early phases of the project, does not require that the reactor will eventually be given operating approvals, or what limitations on operation may be imposed. Operating approvals depend on detailed review of design, construction and testing procedures at the final construction stages.

factors including among other things reactor power level, design features and containment, and site topography. For ~~small~~ any power and test reactors a minimum radius on the order of one-quarter mile will normally be required. For larger power and test reactors a minimum exclusion radius of one-half to three-quarter miles will normally be required. The size of the reactor alone does not determine the size of the exclusion area, but ~~normally a power reactor above~~ a reactor of more than 100 megawatts thermal should have an exclusion radius more than one-quarter mile. 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 minimum of 10 to 20 miles distant from large cities. 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 such releases under the meteorological conditions most likely to occur coincident with the most pessimistic air-borne release is used as a guide 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 major 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. Earthquake history does not necessarily affect approval or disapproval of a site, but the magnitude and frequency of seismic disturbances to be expected are important in setting 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) to avoid contamination of surface and ground waters and other mineral resources. 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. Knowledge of 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. Knowledge of 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.

It is possible that a proposed reactor site might be unsuitable because of its relationship to a watercourse which is important as a source of public water supply or as a source of food.

g. Interrelation of Factors. All of the factors and criteria 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. Thus the more desirable site is one for which each of the environmental factors offers a high degree of protection to the public from radiation and radioactive effluents over and above the protection engineered into the facility.