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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMENT TO THE COMMISSION
ON
ENVIRONMENTAL IMPACT STATEMENT FOR REACTOR SITING CRITERIA

Dated November 17, 1980
Docket No. 7590-01

January 14, 1981

The New York Public Interest Research Group, Inc. (NYPIRG) wishes to submit the following comments on the NRC's "Notice of Intent to Prepare an Environmental Impact Statement for Revision of the Regulations Governing the Siting of Nuclear Power Plants" (7590-01).

The Issue of Comparisons Among Nuclear Power and Various Alternatives

Let us begin with section III.1.b.4 of Appendix A, the tentative Table of Contents for the EIS. It is unclear how the discussion of "attainable risk for nuclear compared to risks from other power generation sources" will be divided between this context and that of V.1.d. In one or the other place, however, if not both, there must be a discussion of the alternative of energy efficiency measures that would obviate the need for new generators of electric power, and the risk (as well as costs and benefits) associated with them.

We wish to stress, also, that comparisons of nuclear and other types of power must include the entire fuel cycle. Consider the environmental costs of the "front end" activities of exploration, mining, milling, processing, and shipping the fuel and of the "back end" activities of locally storing, shipping, and providing perpetual storage of all radioactive wastes and segregating them from the biosphere--both these types of costs were roughly the same for nuclear and for other types of power, then it would be meaningful and useful to make comparisons based solely on the operation of the power plants themselves. It happens, however, that the various power sources differ enormously in just these ways, so that concentrating on just the operating part of the cycle seriously distorts the comparative environmental impacts.

The comparative environmental impact of decommissioning must also be included here. That may not be adequately conceptualized by means of the concept of "attainable risk," though we cannot be sure exactly how it is

interpreted since the term is not defined. It should be obvious, however, that a highly relevant but often over-looked problem in the siting of nuclear plants is their tendency to preempt their sites for the indefinitely predictable future: the induced radioactivity (particularly that of Nickel - 59) is so intense and long-lasting that there is no presently available technology for dismantling large reactor containment vessels without serious jeopardy to workers. If entombed in situ, reactors are likely to be too dangerous to allow the any public access to the site, further use of which would have to be proscribed for the indefinite future. That is not the case for any other power source known to us.

The Need to Get the Consent of the Endangered

Somewhere in the Introduction, presumably as part of III.1.b., there should be discussion of the issue of obtain the consent of the persons whose normal use and enjoyment of the environment would be threatened by the building of a nuclear plant--especially that of people who will derive no benefit. For example, many of the persons who live withing 10 miles of Indian Point obtain no electricity from the two reactors there, yet live under the constant threat of having to be evacuated from their homes in case of a serious accident. When the unbenefitted but threatened persons are citizens of another nation, as could easily happen when the sites are even as far away as two hundred miles of our national boundary with Canada or Mexico, the problem is a particularly sensitive one (though perhaps this is a demographic criterion not listed in III.2.)

A Neglected Environmental Impact: Contamination of Topsoil

There is an important type of environmental impact that does not seem to be mentioned anywhere in the tentative table of contents, but is highly relevant to siting: the need to protect the nation's fast-dwindling supply of topsoil.

Good arable soil on which crops--most important, foodstuffs--can be grown is a precious, virtually irreplaceable, vital resource, which is disappearing at an alarming rate. That is true over much of the world, but notably so in the United States, where huge amounts are lost daily by erosion and by the diversion of land to nonagricultural uses (e.g., urbanization). Our original resources of topsoil were so vast as to seem inexhaustible. Bad as the situation is today, it can only become more critical in future years. The siting of nuclear plants must take this problem into consideration. As we pointed out above, a nuclear installation is unlike almost any other kind of factory or industrial building in that the land it occupies can probably never revert to agricultural use. Accordingly, an important criterion for siting a plant should be that the land to be used be virtually worthless for growing food crops. The benefit to be derived from the electricity generated must at the least be balanced against the social benefit expectable from the crops that can be grown on the same land for, say, at least 1,000 years. The growing pressure of population on land together with increased need for food and the expectable dwindling of topsoil elsewhere from all other causes, can be expected to make the foodstuffs produced in future years much more valuable than those of today.

By the same token, special consideration needs to be given to the present and potential future agricultural productivity of all land threatened by fallout contamination in the event of a serious accident with dispersal of long-lived radionuclides. Discussions of such contamination (as in WASH-1400) recommend removing the topsoil or plowing it under a deep layer of subsoil, taking no note of the fact that either of these procedures would make the land virtually worthless for agriculture. Appropriate concern for one of this nation's most vital and most threatened natural resources would dictate that a reactor should never again be sited as, for example, Clinton is, in the midst of one of our

most productive agricultural regions. The low population density of some such regions may seem to recommend them as desirable sites, but human lives may be lost just as decisively by starvation as by irradiation.

Siting Criteria Must Be Concerned with Consequences, Not Risks

The wording of III.1.b.4., repeatedly mentioning risk but not consequences suggests that the Siting EIS is to contain no discussion of a topic recommended by the ACRS in its comments on the Draft ANR--developign a coherent, general safety policy. We strongly recommend that it confront the need for such a policy and attempt to specify one. The centerpiece of a revised general safety policy must be a change from "risk" to "consequences" as the criterion. By such a criterion, light water reactors of the types currently used in the United States, and shielded in the general fashion that prevails, present wholly unacceptable dangers to this nation. By stressing probabilities and keeping them tiny through a failure to consider any possible causes of accidents that could not be easily quantified, staff and Commissioners alike have managed to convince themselves and much of the public that nothing bad could ever happen. For at least a while, Three Mile Island cracked the hermetic seals keeping out awareness that the atomic business was more dangerous than any other in which mankind has ever dabbled, and by many orders of magnitude.

> "I think Three Mile Island has had a profound effect on me, and on the organization, and all the members of the staff. We now realize that accidents can happen. I think that before Three Mile Island, we sort of thought that accidents really could not happen, and that therefore, we didn't take the sort of emergency precautions, and take all the extraordinary actions that maybe you should."
>
> -- Harold Denton, Director
> Nuclear Reactor Regulation
> at meeting with a group of citizens
> from the Indian Point region,
> January 22, 1980 Bethesda, Maryland

It is time recognize that it was fallacious to discount possible consequences by their low probabilities, if the consequences pass a certain threshold of acceptability.

At the extreme, the argument is easy enough to grasp. Our society can tolerate various dangerous industries which together kill 2,000 workers per year, even though cumulated over 100,000 years the death toll would equal the nation's current population. But an industry that could kill all 200,000,000 of our inhabitants in one year would be intolerable and unacceptable, even though the probability of that event was only .000001. In terms of the usual formula, the risk in both cases is 2,000 fatalities per year if one performs the usual risk multiplication. Past a certain threshold (considerably less than 200 million fatalities), however, our society could not recover, and no prudent nation would take such a risk.

The nuclear industry, we urgently affirm, is already past such a threshold. The often-quoted consequences of the "worst" accident considered in the Reactor Safety Study, for example, are simply not conceivably tolerable. Even if it were free, a thousand megawatts of elecricity for a couple of decades is nowhere nearly enough of a benefit to counterbalance the prompt deaths, latent cancers, property loss, genetic damage, and health effects ("injuries") that would occur in the event of a serious accident.

If the Commission rejects this argument, that the consequences of a Class 9 accident in any but the most naturally protected site (which may well be underground) are simply unacceptable for America, then they must settle on a specific threshold of acceptability and announce it publicly. We doubt the political expendiency of committing the NRC to the proposition that, in order to let the marginally useful nuclear utilities proceed, the nation must be ready to tolerate X thousands of cancer deaths, Y thousands of genetic deaths and deformities, and Z billions of uncompensated property loss. We insist,

however, that if the Commission is going to subject the American people to these perils, they be forthright about it and allow public debate to settle the issue of whether these costs are tolerable.

Indeed, it is impossible to reach definite positions on many of the issues raised in the present Notice unless there is agreement on such threshold values. For example, there is no way to decide how to specify acceptable population densities until we know how many people the utilities are to be allowed to kill in order to have a profitable business.

A siting criterion might specify: "Plants may not be sited so as to endanger the lives of more than 10 (or 1; or 100?) persons per megawatt/year of generating capacity. 'Endanger' here is used to mean to subject human beings of any age, (at any time from the building of the plant until it makes no detectable increment to background radioactivity) to the prospect of being killed as a result of some pathogenic process initiated by exposure to ionizing radiation attributable to the plant in question." We make no specific recommendation about how many lives are to be balanced against the benefit derivable from a megawatt of installed capacity, only that the NRC take a stand on this truly vital and central issue.

Issues Bearing on Demographic Criteria

Under the section III.2.b. or III.2.c., or both, the logic that urges the inclusion of meteorological and topographical constraints argues for attention to all other peculiarities of a site that bear on the possibility of its evacuation. For example, the number, size, condition, and layout of roads in relation to usual and rush-hour traffic; the existence of railroads, a stock of buses, and other public transportation resources in the region; the existence of institutions such as prisons, mental hospitals, "villages" for epileptics of mental defectives, nursing homes for the aged, multilingual population, etc., all of which pose special problems of evacuation.

We have deliberately used a vague term, "the region" of a site, in the preceding; but it is plain that one cannot choose precise values for standoff distances, etc., without making fundamental decisions about how many lives are to be traded off for electric power. (We are aware that some such tradeoff cannot be escaped. For example, old-fashioned coal-burning plants take a heavy toll in lives. Any comparison with nuclear, however, should presume fluidized bed combustion and best available scrubber technology.) It is of course tempting to avoid the issue and lean on available "solutions" like the emerging conventions of the Emergency Planning Zones of 10 and 50 miles. They seem to have a rational basis in the charts and computations of NUREG-0396. If one studies those carefully, however, it is evident that the 10 and 50 mile sizes of the EPZs were choices of desperation or of cynicism, inspired by the same reverse priorities that make saving lives secondary to saving the nuclear industry. For, in the event of any of various Class 9 accidents, even if everyone is magically whisked out of the 10 mile circle around such a nuclear plant as Zion, there will still be thousands of deaths from cancer and tens of thousands of genetic injuries. Apparently that won't matter, however, because it will be impossible to prove that these excess deaths were caused by the accident; the zones were chosen mainly in terms of the shapes of curves of prompt (and thus traceable) deaths -- effects, moreover, on hypothetical healthy adults, which therefore ignore birth defects, or illnesses and deaths of fetuses and infants.

We urge, instead, a more realistic thinking of those distances based on a fixed and universally applied criterion of an "acceptable" number of deaths/megawatt/year. In computing that number for any given site, regulations should require that one first include the approximately 400 deaths/year of operation attributable to tailings generated in the mining and processing

of the uranium to fuel a reactor of average size, plus similar appropriate allowances for cancer deaths in the entire workforce (miners, millers, processors, generating plant workers, waste disposal truckers and disposal site workers, and workers who will be irradiated in decommissioning the plant), plus an appropriate allowance for exposure to all wastes over the next half-million years. Then, the existing level of endangerment at the site under consideration must be computed, taking into account the danger from all other existing reactors withing 200 miles. A recent Task Force report (paraphrased in Docket Nos. 50-247, 50-286, p. 6) noted that "Latent cancers...are dominated by the population within about a 200-mile radius of the plant." As Fig. 1-16 on p. I-46 of NUREG-0396 shows, in the event of an atmospheric release from a PWR, 20% of unprotected individuals would get 25-rem does to their thyroids even at 200 miles, a very dangerous dose for an infant or fetus. The probability of infantile thyroid cancer, no doubt small from any one plant, increases considerabley when one integrates the risks from all reactors in a region, considering routine (including "unplanned") emissions as well as "accidental" ones. Indeed, we believe that if this point of view is taken seriously, the northeastern part of the United States is already greatly oversaturated with nuclear stations and urgently needs for at least those posing the greatest societal threat to be shut down and decommissioned.

If, after all the preceding calculations, there is still a margin of safety, the burden of proof must be on the licensees to demonstrate that the plant can be built, operated, and decommissioned without possibility of exceeding the allowable number of deaths/megawatt/year, in the worst-case accident.

Dangers to Water Supplies

Turning to section III.4, we object to the proposed title, which seems to limit concern to the possible contamination of groundwater. The title would

be clearer as well as more comprehensive if it read: "Capability to Prevent Contamination of Water Supplies." We do not wish in any way to play down the importance of protecting our precious and too-neglected groundwater resources, but merely to point out the fact that siting rules must take into account the fact that many reactors in the past (e.g., Three Mile Island) have been located at sites where they contaminated rivers and freshwater lakes used as the drinking-water supplies of many people, and others (e.g., Indian Point) are located near watersheds and open reservoirs where they could, in the event of an accident, contaminate the drinking water of many millions of people. For example, if a storage pool at Indian Point were to dry out, in any of various kinds of accidents, a zirconium fire could distribute substantial quantities of fission products over a wide region where they would wash or fall directly into the water supplies of many towns and cities in addition to that of the New York metropolitan region. Despite dilution, many deaths could occur. New siting regulations must guarantee that no such endangerment should take place in the future.

Rejection of "Unproven" Designs

As to III.6, it is difficult to understand why any such section would have to be in a report of this kind. If it were in fact possible to compensate for, say, too great proximity to too many people, by a unique design that would adequately protect those people, who could object? Presumbly the intent is to allow only already "proven" designs, a conservative procedure indeed if such designs exist. We note, however, that this rule would exclude any consideration of underground construction, a "design feature" long advocated by prominent figures in the pronuclear community.

Let us consider now Appendix B, since it takes up in greater detail the rest of the outline.

I. Radiological Consequences of Accidents. This section must indeed examine the consequences of a "full range of accidents" that could possibly occur at a particular site. That means paying particular attention to the local likelihood of the very kinds of causes of accidents that have been traditionally excluded from quantitative risk assessments, most notoriously by the RSS: sabotage by workers, external attacks by criminals, terrorists, or enemies of the United States, impact of fire, flood, windstorm, etc. Moreover, special attention must be paid to the vulnerability not just of the containment building and its contents, but to the storage pool(s), since it must be assumed that large quantitites of dangerous radionuclides will be kept in them until there is an effective national policy in place for storing spent fuel away from the reactors.

It is difficult to comment on the adequacy of the proposed procedure of relying on "an updated version of the Reactor Safety Study Consequences Model (CRAC) computer code." (By "code" we presume that you mean "program," a clearer and much preferable term.) To intimate that the staff intends to rely on the approach of thoroughly discredited RSS is to invite a complete lack of public faith in the results, unless it is shown in considerable detail that the revisions have corrected the many systematic biases of that study, introduced with the avowed purpose of gulling the public and making the results palatable to the industry. The burden of proof rests heavily on anyone who proposes to build on that shaky foundation that he is not coming up with another whitewash. The EIS must contain an appendix, therefore, in which the assumptions incorporated in the CRAC program are spelled out, and in which it is demonstrated that all the devices by which the RSS achieved its systematic underestimation of consequences have been removed and replaced by scientifically respectable procedures. The entire inventory of fission products

must be included, for example; a good computer program can automatically give the short-lived ones the weight they actually deserve at each assumed time interval between full operations and environmental release. In some conceivable accidents of external origin (severe earthquake, crash of a heavily loaded plane into the containment building) this time interval would be on the order of seconds or minutes at most, so people within a few miles would be exposed to millions of curies of short-lived fission products that were arbitrarily excluded from any consideration by the RSS, in addition to a heavy burden of longer-lived ones.

The list of consequences that will be considered does not include genetic effects. That may have been a typographical inadvertence rather than a considered decision, but in any event it is imperative that the full genetic consequences of any nuclear accident as well as of routine operations be included. By "full" we mean non-lethal as well as lethal mutations, and effects integrated over many generations, not just the first. As to the category of "injuries," the EIS must contain explicit explanation of all non-lethal health effects that are included and many that are excluded--as so many were by the RSS--with a clear justification for each exclusion.

To anticipate the next section, it is necessary in computing consequences not to assume 100% effectiveness of notification; hence sheltering, evacuation, or the taking of appropriate doses of potassium iodide must be assumed to be even less effective. Indeed, it may be reasonable not to assume any evacuation for at least the first day of an accident. New emergency planning regulations attempt to guarantee prompt notification of the public, but fail to limit decision times for either the licensee or the public officials involved. Hence, radioactive emissions may be at their greatest while these persons are deciding to get the word out to evacuate. Any resulting overestimation of prompt deaths from radiation will be counterbalanced by

deaths from the process of evacuation itself, which can hardly be estimated.

III., IV., & VIII. Definition of Region; Site Availability; and Precluding Siting...in any Region. These three need to be discussed together, since the flimsy argument of the first paragraph on p. 16 is the basis on which the other two are predicated. It is a hypothesis, not a demonstrated fact, that the risks "from some energy sources may be greater than" those of nuclear power; we believe that it is easy to refute the hypothesis. Indeed, it is defensible only if one makes arbitrary assumptions, amounting to a refusal to consider many predictable deaths entailed by the nuclear option. The The position presented in the paragraph following issue VIII would make sense only if there were safer alternatives anywhere in the United States. It would of course be poor public policy to adopt criteria that would exclude nuclear power from a region if the result was that the region had to turn to a riskier alternative, but the burden of proof should be on anyone who maintains that such is the case. The alternative of investing in energy efficiency is universally available, and can always be presumed to be more cost-effective and less socially dangerous unless a site-specific refutation can be made. Section IV.3.d. must contain a full discussion of this point, as well as realistic comparisons of nuclear with various forms of solar and fossil fuel sources.

In any event, it makes no sense to specify that criteria for siting should not preclude the locating of nuclear power plants in any region; the very purpose of the criteria is to exclude plants where they would threaten the public health and safety. If criteria never preclude the building of plants anywhere, they are useless. The disingenuous wording of these paragraphs on pp. 14 and 16 make it evident that the framers of the present notice have continued the NRC's tradition of silently assuming that we must 'preserve the nuclear option' for all sectors of our society, as a self-evident good. Secondarily, health and safety must be protected as much as is feasible or

or practical, though one mustn't get too idealistic about such matters. Here is the same mentality that refused to find serious accidents credible, even though the insurance industry, entrusted with evaluating risks and cushioning them financially, has never been willing to underwrite nuclear power by more than a token amount.

At the time when the Atomic Energy Act was passed, Congress assumed that the benefits of the peacetime uses of the atom would be huge and the social costs minimal, the dangers easily controllable. They therefore charged the AEC with promoting and regulating atomic energy, secondarily specifying that it should be done without unduly endangering the American people.

Since the abolition of the AEC and the division of its responsibilities (with DOE), the NRC has been charged in the plainest of words with protecting the health and safety of the public. Today there is reason to believe that it may be impossible to have a viable nuclear electrical industry and to safeguard the public. That possibility seems unthinkable to NRC staff people. They act as if it is unquestionable that there must be nuclear electricity--the protection afforded workers and the general public can therefore be only as good as is attainable under that limiting condition. (Somehow this conflict of interest for NRC people must eventually be addressed.)

We are hopeful that as a result of the warning provided by the accident at Three Mile Island, a shift is now occurring in the United States to the priorities specified in the current law: first, protecting the public health and safety, and then allowing the development of nuclear energy, but only to the extent possible under that restriction. This shift is evident in the recognition that new and stringent siting policies are necessary for atomic power plants.

If there are regions of the country where the nuclear power option is

incompatible with public health and safety (because of high and dense population, e.g., Indian Point; or seismic activity, e.g., Rancho Seco; dependence on a sole-source aquifer, e.g., Shoreham; or other such characteristics), the NRC's siting regulations must not shrink from prohibiting reactors there.

The last paragraph on p. 14 alludes to "the intent of NRC FR80 Authorization Act," overlooking the fact that Congress was not presented with the facts available about the cumulative degree of risk in the densely populated northeastern region of the United States, from the great number of nuclear reactors already sited here. It would be the height of irresponsibility to lean on that act in support of a policy that no region should be deprived of further nuclear plants, no matter how many lives will be endangered and regardless of other social costs.

In the absence of any cogent or defensible argument for separate regional criteria, there is no need to define regions (section IV.3.a.).

V. Socioeconomic Impacts. So far, in discussing the socioeconomic impacts of siting nuclear power plants, the NRC has never considered the implications for our social, political, economic, and other institutions of the generally increasing size and centralization of electrical power generating facilities. The economies of scale have been taken as self-evident and unquestionable, and the diseconomies and other dysfunctional aspects of this trend toward bigness have been ignored. Schumacher (Small is Beautiful) and others have convincingly argued, however, that as our population grows larger and more dense there is a growing need for more decentralized power generation. It is inherently more reliable, less likely to cause widespread blackouts, provides more jobs per investment dollar, counteracts the dangerous growth of political power by large corporations which has now become a serious threat to democracy, and tends to promote

many traditional American values (self-reliance, local initiative, sense of responsibility, freedom, etc.)

X. Post-Licensing Land Use Control. It is not clear what this section is to include, but it would seem a reasonable place to consider the environmental impact of the decommissioning of the plant and restoration of the site to other use or (more probably) the feasibility of its indefinite proscription to further human use.

XII. Use of Federal Lands. NYPIRG disapproves in principle of using federal lands for the profit of private businesses. Surely the criteria should absolutely forbid the siting of nuclear reactors on wilderness areas, wildlife preserves, and national parks or seashores. It is conceivable that certain lands, which either have reverted to public ownership or have never been claimed for private use because of their general barrenness and lack of suitability as habitats for any form of life, might be appropriate sites. The required EIS would have to give careful consideration to the impact of possible accidents on endangered species, however.

Respectfully submitted,

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