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NUREG-0499
SUPPLEMENT 1

GENERAL CONSIDERATIONS AND ISSUES OF SIGNIFICANCE ON THE EVALUATION OF ALTERNATIVE SITES FOR NUCLEAR GENERATING STATIONS UNDER NEPA

Supplement No. 1
to the
Preliminary Statement on General Policy for Rulemaking to Improve Nuclear Power Plant Licensing

Office of Standards Development
and
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission

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U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

PREFACE

The analysis of alternatives has long been regarded as the "linchpin" of the environmental impact statement process. In a number of licensing cases involving construction permits for nuclear generating facilities, issues related to alternative siting methodology and its implementation have been a major source of controversy. Recognizing the need for specific policy formulation to improve the effective resolution of these issues, the Commission recently requested the staff for a clarification of issues as a prelude to future possible rulemaking.

In a parallel activity, an NRC study group seeking to identify ways to improve the effectiveness of NRC nuclear power plant licensing procedures recommended in June 1977 (see NUREG-0292) that, among other measures, rulemaking should be considered for the generic resolution of certain issues presently litigated in individual licensing proceedings. An interim policy statement on generic rulemaking was published in the Federal Register on December 14, 1978, with a 60-day period for public comment ending on February 12, 1979. Additional technical detail on the ten issues identified by the staff for possible rulemaking was provided in NUREG-0499, "Preliminary Statement on General Policy for Rulemaking to Improve Nuclear Power Plant Licensing."

One of the ten issues proposed by the staff for consideration in generic rulemaking is alternative siting methodology and information requirements.

Recognizing the need for further clarification of this issue, the staff is issuing this Supplement No. 1 to NUREG-0499, a staff report entitled "General Considerations and Issues of Significance On The Evaluation of Alternative Sites For Nuclear Generating Stations Under NEPA." The major purpose of this report, which reflects the current state and diversity of staff thinking on a complexity of interrelated policy considerations and issues, is to provide additional information to members of the public, industry, and other governmental agencies who wish to comment by February 12, 1979, on issues of alternative siting.

The basic structure of this report is a preliminary staff statement of general considerations on alternative siting review procedures (the main text), plus Enclosure A which provides a discussion of possible optional NRC procedures for analysis and decision. Enclosure B provides a variance to the preliminary staff statement of general considerations. Most of the discussion provided in Enclosure A would be equally applicable if the statement of general considerations were modified in accordance with Enclosure B.

It is hoped that this report will provide a suitable framing of general considerations and discussion of issues and options so as to promote constructive public comment. Such public comment would enhance consideration of this important subject by the Commission.

The text of the Federal Register notice announcing the availability of NUREG-0499, Supplement No. 1, follows:

NUCLEAR REGULATORY COMMISSION

STAFF REPORT ON, "GENERAL CONSIDERATIONS AND ISSUES OF SIGNIFICANCE ON THE EVALUATION OF ALTERNATIVE SITES FOR NUCLEAR GENERATING STATIONS UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT" (NUREG-0499, SUPPLEMENT NO. 1)

Availability of Document for Public Comment

The Nuclear Regulatory Commission issued an "Interim Policy Statement on Generic Rulemaking to Improve Nuclear Power Plant Licensing," published in the Federal Register on December 14, 1978, with a 60-day comment period ending February 12, 1979. This interim policy statement identifies ten issues for possible rulemaking that might improve the effectiveness of the NRC nuclear power plant licensing procedures. A staff document (NUREG-0499, "Preliminary Statement on General Policy for Rulemaking to Improve Nuclear Power Plant Licensing") was also issued to provide more detail on these ten issues.

One of the ten issues proposed by the staff for consideration in generic rulemaking is alternative siting methodology and information requirements. Subsequently, the staff developed more detailed information on the subject of alternative sites. The purpose of NUREG-0499, Supplement No. 1, therefore, is to provide this more detailed information to better focus public comment on NUREG-0499. Such public comment would enhance subsequent consideration of this important subject by the Commission.

The Supplement 1 to NUREG-0499 is available for inspection by the public in the Commission's Public Document Room at 1717 H Street, N.W., Washington, D.C. Requests for single copies should be addressed to the Division of Technical Information and Document Control, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

Interested persons are invited to comment on Supplement 1 of NUREG-0499 by February 12, 1979. Comments should be addressed to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Services Branch.

For further information contact Malcolm L. Ernst, Assistant Director for Environmental Technology, Office of Nuclear Reactor Regulation, Mail Stop P-302, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, telephone 301-492-8016.

Dated at Washington, D.C. this 14 day of December 1978.

FOR THE NUCLEAR REGULATORY COMMISSION

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

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GENERAL CONSIDERATIONS AND ISSUES OF SIGNIFICANCE ON THE EVALUATION OF ALTERNATIVE SITES FOR NUCLEAR GENERATING STATIONS UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT

Background

Since the enactment of the National Environmental Policy Act (NEPA) of 1969, the review of alternatives to any major Federal action which would significantly affect the quality of the human environment has become an integral part of the planning and decision making processes of Federal Agencies. In 1973, the Atomic Energy Commission promulgated Part 51 of 10 CFR, which established its licensing and regulatory policy and procedures under NEPA. Part 51 requires that each applicant for a permit to construct a nuclear generating station discuss in an Environmental Report "appropriate alternatives" to the proposed facility. Using information contained in this report and information obtained from other sources, the Nuclear Regulatory Commission (NRC) staff prepares a draft environmental statement. This statement includes a preliminary benefit-cost analysis which balances the environmental and other effects (a) of the facility and (b) of the alternatives available for reducing or avoiding adverse environmental and other effects. Among the primary alternatives to be considered once the need for a facility has been established are alternative sites for the facility. All subsequent considerations of alternatives deal with design options or structure locations; these are normally alterations to mitigate impacts on the chosen site. The draft environmental statement is circulated for public comment and interagency review and after comments

are received a final environmental statement is prepared, which contains a final benefit-cost analysis and a final staff conclusion as to whether or not to issue a permit to construct a nuclear generating station.

The consideration and evaluation of alternative sites for a proposed generating station is a complex, difficult task for both the applicant and the NRC staff. As a practical matter, the "best" site in any given region for a nuclear generating station of a given size and character cannot usually be identified. The costs of the needed analyses are usually so high that seeking a best site cannot be justified on a benefit cost basis. Also, effects and site attributes measured quantitatively, but not necessarily in the same units, and those measured qualitatively cannot, in most instances, be combined to yield a rigorous formal measure of relative merit for use in comparing alternatives. Uncertainty about the precise character of any site also complicates the analysis. However, even if uncertainty were not present, any given site could only be judged superior or best if each of its characteristics could be shown to be equivalent to or better than the corresponding characteristic of each alternative, with at least one characteristic being judged better than the corresponding characteristic for each alternative.

To date, a case-by-case approach has been taken by the NRC staff to the review of an applicant's selection and evaluation of alternative sites. Some guidance to the applicant for the site selection process and for the evaluation of alternatives is provided in Regulatory Guide 4.2 and in Regulatory Guide 4.7.

In its review, the NRC staff uses information supplied by the applicant along with information from other sources to develop an independent evaluation and its own conclusions about the relative merits of the site proposed by the applicant. In the past, the NRC staff has frequently requested both additional information on the sites an applicant has evaluated and additional alternative site evaluations. Some requests for additional information have been made when a parameter (e.g., population) assumes special significance but more often a lack of data or inadequate data has been the basis for such requests. The additional data requested from the applicant are used to supplement other sources of information, including reports from State and other agencies, scientific journals, technical conferences and personal knowledge. Some additional information is obtained by personal visits by NRC staff to the sites and from NRC staff discussions with local agencies and citizens. These sources provide the basis for judging the adequacy of the applicant's information. Requests for the consideration of additional sites have usually been made when the NRC staff concludes that realistic alternative sites were not identified and evaluated or when the sites presented did not offer real alternatives for the utilization of the resources of a region.

Currently, the number of alternative sites evaluated is not specified and varies from case-to-case. The usual approach is to identify a set of potential sites and to rank these sites in order to define a set of candidate sites. The scheme for ranking varies with applicants and, at present, explicit criteria for judging the adequacy of the ranking process do not exist. No matter how the set of potential sites is ranked, those that are

unacceptable are rejected and those remaining are evaluated on the basis of environmental and other effects to determine the proposed site. Regulatory Guide 4.2 suggests that a cost effectiveness analysis, covering both environmental and economic costs, be used to demonstrate why the proposed site-plant combination is preferred over all other realistic alternatives.

Once a site has been selected, the applicant conducts a detailed local study of the environs, including surveys of the biota, collection of physicochemical data and other information from which estimates of potential environmental impacts of construction, operation, and decommissioning of the proposed nuclear power plant are made. The detailed estimate of environmental impacts is reviewed and analyzed by the NRC staff to assure the acceptability of the proposed site. No local detailed studies are performed on the alternative candidate sites. The staff's assessment of the acceptability of a site is made from a determination that existing environmental and safety standards are met and by a final benefit cost analysis which demonstrates why the aggregate benefits outweigh the aggregate costs of the proposed station. If the staff's assessment is favorable, an Atomic Safety and Licensing Board reviews the application and, if this board concurs with the staff assessment, a construction permit is issued by the Commission. The licensing board's determination is in turn subject to review by an Atomic Safety and Licensing Appeal Board.

General Considerations

As part of its current review of reactor site evaluation policy and practice, the Commission seeks to develop a more standardized approach to

the treatment of alternative sites under NEPA. From a technical or analytical viewpoint, the evaluation of alternative sites can be broken into three general stages: (1) identification of candidate sites, all of which should be judged potentially licensable, (2) selection of the proposed site from the set of candidate sites, and (3) after selection of the proposed site, evaluation of it using detailed baseline information at a Construction Permit review or Early Review of Site Suitability Issues. In the licensing process for nuclear generating stations, the first two stages are undertaken by the applicant and his analyses and results for each stage are reviewed by the NRC staff in its Construction Permit review. The third stage, which is based on more extensive or detailed data than the first two, occurs in the Construction Permit review and will occur in a complete Early Review of Site Suitability Issues.

The staff's review of the applicant's process for identifying candidate sites and selecting the proposed site, should show that the applicant has employed a practicable process. The review should reveal that the applicant has identified candidate sites that are among the best that could reasonably have been found for a nuclear generating station of a given size and character. Such a decision standard identifies candidate sites all of which should be licensable. The proposed site should come from this set of candidate sites. Because the candidate sites should be very similar in quality, because the analysis upon which site selection is based requires the comparison of diverse environmental and economic factors, and because uncertainty is inherent in site selection, the proposed site cannot, within the bounds of reasonableness, be shown to be the best. Some criterion is required to

assure that it is similar in quality to the other candidate sites. Only if no other candidate site appears to be obviously superior to a given site should that site be proposed or accepted as the location of a nuclear generating station. This relative threshold criterion for comparison of a proposed site with a set of candidate sites prevents the applicant from selecting a poor, though licensable, site from a set but does not require that the applicant attempt to determine which site is best.

In the implementation of the "obviously superior" criterion for the selection of the proposed site from a set of candidate sites, the NRC will employ all reasonable means to make its views on the applicant's site evaluations known early. However, the NRC, in doing this, should not be placed in the position of specifically identifying a site or sites that are obviously superior. The function of the NRC is not to select sites, but only to approve or reject the site proposed by the applicant. The NRC will reject an applicant's proposed site (a) if one or more features of the proposed site are shown to be obviously inferior (although marginally licensable) and (b) if other sites (whether among the applicant's candidate sites or not) are shown to exist that would likely not have these or some other infirmities of comparable severity and importance.* In other words,

*The purpose of the Commission's "obviously superior" criterion is to take account of uncertainty of comparative analyses and/or incompleteness of information which are involved in the comparison of the proposed site with alternative sites, so that real differences may be determined. Consequently, "obviously superior" alternatives are those which are <u>actually</u> superior; i.e., the differences are real and not merely a function of either the limited quantity and quality of information available at the alternative site(s) as compared to that available at the proposed site or of the limitations of cost-benefit analysis. This notion of the question of confidence that differences are real is high-lighted in the recent First

(continued)

the obviously superior standard will dictate the rejection of the site an applicant selects from a set of candidate sites if this site is shown to suffer from substantial infirmities in important site characteristics and that some other site likely exists which does not have these or other comparable significant infirmities. Even when the proposed site is not found by the staff to contain any 'obviously inferior' quality a reasonable range of alternative sites will be evaluated by the staff to determine whether there is any "obviously superior" alternative. The purpose of the "obviously inferior" criterion is to determine the depth to which the staff needs to examine the applicant's site selection process.

Once the proposed site has been selected and detailed baseline studies have been completed, more is known about the proposed site than any alternative to it. A substantial commitment, which deepens as time passes, has also been made in terms of time and financial resources spent in evaluating the characteristics of the proposed site. The passage of time may bring the clarification of uncertainties and either confirmation of the correctness of the original decision or the assessment that sites better than the applicant's proposed site may exist. The characteristics and qualities of these other sites will not be known, however, in the detail or with the

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* (continued)
Circuit decision in Seabrook: "The (obviously superior) standard is designed to guarantee that a proposed site will not be rejected in favor of a substitute unless, on the basis of appropriate study, the Commission can be confident that such action is called for." (Slip Opinion at 13, emphasis added). In light of these considerations, the NRC staff should consider adequacy of information and seek refined cost-benefit analytical techniques that can be applied to specific cases where reasonable, to minimize these inherent uncertainties. Only after the uncertainty is reduced to the reasonable minimum should the staff be concerned with whether the remaining differences render the alternative site(s) obviously superior.

surety that those of the proposed site are known. Thus, uncertainty of the type and nature confronting the initial evaluation of alternative sites will be present in any comparative evaluation of the proposed site with respect to other sites during the Construction Permit review, during a full Early Review of Site Suitability Issues, after issuance of a Limited Work Authorization, or after issuance of a Construction Permit. For this reason and because the evaluation of alternatives must be practicable and reasonable, the proposed site should not be rejected in such a review (a) unless an obviously superior alternative exists and (b) only after comparison of the actual (environmental and economic) costs of completing construction of a nuclear generating station at the proposed site with the costs of construction at any alternative site.

Under these decision standards it is not necessary that all types of information be treated equally; much more detail will be needed for critical factors (e.g., geology, seismology, hydrology, population) than for others (e.g., noise impacts). In addition, the type of data used in identifying candidate sites may vary and may differ from that needed to select a proposed site.

Information used to identify candidate sites and to select the proposed site from a set of candidate sites is normally not as detailed as the baseline data used to evaluate the proposed site alone during Construction Permit review or a complete Early Review of Site Suitability Issues. The assessment of the relative merit of a set of a candidate sites and the selection of the proposed site can ordinarily be accomplished with less than baseline data for each site. For these assessments, baseline data,

which is difficult and expensive to collect, does not ordinarily provide a significant advantage over reconnaissance level information, which may be defined as information obtained from readily available sources and from a short field investigation of a site. Moreover, even if applicants did submit exhaustive analyses of several candidate sites along with the evaluation of the proposed site, additional alternatives raised by the staff or by the intervenors would have to be considered in granting a Construction Permit. It could be very expensive to generate information on each of those sites which would allow an equivalent comparison between them and the proposed site. The identification of candidate sites and the selection of the proposed site from a set of candidate sites will not ordinarily be based, therefore, on the detailed baseline data presently required to judge the suitability of the applicant's proposed site.

In some instances available detailed information on the proposed site will identify impacts which would likely not have been identified based on review of reconnaissance level information. In giving weight to these impacts (i.e., in determining whether these are substantial infirmities of the proposed site) NRC would consider whether:

(a) these types of impacts are likely to occur at other sites, where only reconnaissance level information exists; or

(b) these impacts can be reasonably mitigated by appropriate design of the plant (i.e., mitigation can reasonably be achieved with available technology at a cost that is not excessive).

The relationship of Early Review of Site Suitability Issues, Construction Permit, and Operating License reviews of the evaluation of alternative

sites is also of concern. The decision criteria and procedures used in a complete Early Review of Site Suitability Issue should be the duplicate of those used in the Construction Permit review. As the recently enacted regulation for Early Review of Site Suitability Issues provides, the review of the evaluation of alternative sites should occur at either the Early Review or the Construction Permit review stage, but not both, unless significant new information that substantially affects the earlier conclusions is found to exist. Also, staff reevaluation of alternative sites should not occur in the Operating License review absent new information which, taking into account the commitment already made to the proposed site at that stage of the proceeding as compared with the cost of building the facility at an alternative site, indicates that the alternative site is obviously superior to the proposed site. In practical terms this means that after the facility is essentially built, the likelihood that the cost-benefit analysis would so favor an alternative as to result in rejection of the proposed site is vanishingly small. Of course alternative sites would be reevaluated if there is substantive new information that demonstrates that the proposed site is unsuitable with respect to safety and the environment, since the proposed site would be rejected and a new site would need to be selected.

ENCLOSURE A

ISSUES OF SIGNIFICANCE RELATING TO REVIEW OF

ALTERNATIVE SITES FOR NUCLEAR POWER FACILITIES

Introduction

Policy formulation is felt to be necessary in at least the areas identified in the preceding text, as well as perhaps in other areas discussed in this Enclosure. Also, the methods of implementation of any final policy formulation are equally important; and it is believed that such implementation should, to the extent possible, be expressed in the form of rulemaking.

Elements of policy and the implementation of policy include matters such as: (i) What constitutes an appropriate set of alternatives (e.g., the number and characteristics of alternative sites to be considered that is reasonable in terms of social purposes usefully served); (ii) What comprises a sufficient study of alternatives (e.g., the scope and depth of information assembled and the adequacy of methodologies for using the information in estimating or forecasting significant effects on the human environment); (iii) What constitutes appropriate thresholds for determining the significance of environmental effects, which then provide a basis for decision-making in alternative site comparisons; (iv) What criteria should determine the acceptability of candidate area screening and site selection procedures; and (v) What criteria should be employed in the decision-making process that would be consistent with NEPA.

The initial draft of this enclosure, which provides a discussion of the various issues important to the subject of alternative sites, was developed by an NRC inter-Office task force consisting of persons intimately familiar with the technical, legal, and procedural aspects of the issues. This task force was composed of:

Malcolm L. Ernst, Chairman, Environmental Technology, Office of Nuclear Reactor Regulation (NRR)

Miller B. Spangler, Environmental Technology, NRR

William H. Regan, Environmental Projects, NRR

Edward E. Held, Site Designation Standards Branch, Office of Standards Development (SD)

Harold Berkson, Environmental Specialists Branch, NRR

Donald P. Cleary, Cost-Benefit Analysis Branch, NRR

Jerry R. Kline, Environmental Specialists Branch, NRR

Marcia E. Mulkey, Office of Executive Legal Director

Richard W. Froelich, Environmental Projects, NRR

Jan A. Norris, Environmental Projects, NRR

Kenneth E. Perkins, Site Designation Standards Branch, SD

William R. Ott, Environmental Standards Branch, SD

Louis M. Bykoski, Cost-Benefit Analysis Branch, NRR

The first section of this enclosure provides certain definitions and premises that were agreed to prior to preparation of the discussion of the issues. Given the complexity of issues and sub-issues, there are a

number of ways by which these might have been structured. The following seven issues, which comprise the main body of Enclosure A, provide a structuring and sequencing of logical elements of the NRC review and decisional process that was adopted by the task force, recognizing that many of the elements are strongly interrelated. These seven basic issues are:

(1) NRC's role vis-á-vis responsibilities of the applicant, Federal and State agencies and regional and other institutions

(2) Identifying the region of interest (ROI)

(3) The process of identifying candidate sites

(4) Criteria for determining the "obvious superiority/inferiority" of the alternative/proposed sites

(5) Information requirements for siting analysis and decisions

(6) Reevaluation of the alternative sites issue after plant construction has begun

(7) Consideration of alternate sites for applications involving pre-approved sites

Within each issue, there is a typical format that was generally followed. First is a discussion of the important elements or subissues involved. Next is a presentation of the more important technical, legal, and public interest considerations that would impact a decision as to the proper course of action. Then there is normally a discussion of some (not all inclusive) optional courses of action that might be taken by the NRC,

together with a brief discussion of pros and cons. Finally, there is a discussion of any consensus reached by the staff on any aspects of the issue.

Nothing in the discussion of issues to follow should be construed as a final staff position on the matters treated herein. Public comment received on these matters will be duly considered before the staff recommends to the Commission the formulation of specific policies or generic rules.

Definitions and Premises

Definitions

1. The relevant set of environmental impact considerations of alternative sites includes all environmental effects of significance to various societal interests that are (i) beneficial or adverse; (ii) direct or indirect; (iii) quantifiable or intangible; (iv) short- or long-term; (v) intended or unintended; and (vi) certain or probabilistic in realization. These considerations plus the technological and financial cost considerations comprise the scope of cost-benefit balancing factors required in a NEPA impact statement.

2. Reconnaissance level information is defined as information obtained from published reports, public records, public and private agencies, individuals knowledgeable about the area or site, and from a short field investigation of a site.

3. Screening criteria are factual and judgmental standards by which decisions are reached to eliminate or accept certain areas or sites for further consideration in the seeking of potential candidate sites.

4. Impacts associated with a site include transmission corridor and any regional impacts resultant from construction and operation of the facility.

5. The validation of information, analyses, and forecasts of environmental impacts and technical/economic considerations supplied by the applicant involves the verification of provable facts and the application of expert judgment to evaluate analyses or forecasts. Any staff affirmation of reasonableness would consider the importance and inherent nature of uncertainty involved in analysis and forecasting, and the costs of gathering additional information or performing additional analyses in terms of their benefits in reducing uncertainty.

6. Environmentally preferred alternative site means that, on balance, the environmental impacts at an alternative site are sufficiently less than at the proposed site that a clear preference for the alternate site can be established. The uncertainty in such a decision is a function of the available data to support analysis and the perceived weights given to various environmental impacts. Thus, the term "environmentally preferred" is philosophically related to the term "obviously superior."

7. A resource area is a reasonably homogeneous area within the region of interest investigated for potential sites. As a rule, the region of interest should contain more than one such area. It is expected that each resource area will be small enough to have essentially similar characteristics (e.g., geology) and environmental characteristics (e.g., land use patterns, water supply). Resource areas should not be restricted to those containing land owned or controlled by the applicant. (From draft Environmental Standard Review Plan 9.2, Alternate Sites.)

8. Environmental effects include adverse and beneficial impacts of the proposed action and its reasonable alternatives on the human environment. According to the definition proposed by the CEQ; "human environment" shall be interpreted comprehensively to include the natural and physical environment and the interaction of people with that environment. This means that exclusively economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are inter-related, then the environmental impact statement will discuss all of these effects on the human environment.

Premises

1. The legal responsibility of the NRC regarding alternative sites is limited to that required by NEPA and the Energy Reorganization Act of 1974 and is to make a decision to accept or reject the proposed site. If the proposed site is rejected, the NRC has no responsibility or authority to require the applicant to propose or select any specific alternative site.

2. Neither NEPA nor NRC policy requires the selection of the single "best" site from an environmental standpoint.

3. Neither NEPA nor NRC policy requires the staff to conduct a fully independent candidate area screening and site identification process; i.e., a process which involves no information demands on applicants. The degree of independence that should be exercised by the NRC in the review of the applicant's site selection process is discussed as Issue No. 1.

4. NRC policy does not require a determination by staff of a "best" screening or site selection and evaluation methodology, but should rely on the development of reasonable and realistic criteria for evaluating the methodology that would accommodate an acceptable range of procedures.

5. The multi-part decision standard, which requires that the identified candidate sites are "among the best that could reasonably have been found" and that the proposed site is acceptable only when no alternative candidate site is "obviously superior," is responsive to NEPA requirements.

   In addition to NEPA requirements, the Atomic Energy Act requires consideration of "site suitability" with respect to health and safety issues. An unsuitable finding on one of these issues poses a "no go" situation.

6. The same alternative site review requirements established for a construction permit should apply to approval of a site in an Early Site Review.

7. No additional review of alternative sites would be required at the operating license stage unless there is new information which reasonably demonstrates that, considering forward costs, there is a possibility that a cost-benefit analysis would show that the plant should be rebuilt on an alternate site. In practice, this means that alternative sites likely will not be rereviewed and that rejection of the proposed site would only be on the demonstration that the proposed site is unsuitable with respect to safety or the environment (see Issue 6).

ISSUE NO. 1

NRC's Role Vis-á-Vis Responsibilities of the Applicant, Federal and State Agencies and Regional and Other Institutions

Description of Issue

This issue is concerned with the extent and performance of NRC's basic responsibilities under NEPA relative to that of an applicant, another Federal agency, or a State or regional agency or institution. It is clear under NEPA that NRC has ultimate responsibility to perform the environmental analysis for a nuclear power plant and associated alternatives, and that an applicant or any other party does not share this ultimate responsibility. By Title 10, Part 51, CFR, NRC imposes upon an applicant a requirement to gather, analyze, and present data and other information in order to aid the Commission in complying with Section 102(2)(C) of NEPA. Guidance on the type and scope of information and analysis required is given in regulatory guides and in specific requests whenever deficiencies in information or analysis are found in reviewing the environmental report. With few exceptions the role of Federal and State Agencies and regional and other institutions in supporting NRC's NEPA responsibilities is ad hoc and not well defined.

The issue, simply put, is how far can NRC go in using information and analysis generated by an applicant, or others, and still meet the

requirements of conducting an independent analysis? What information and analysis can NRC request of others and how must NRC treat that information and analysis?

Technical Considerations

It is not likely that the reconnaissance level information available to the staff and the applicant will be greatly different. Therefore, what constitutes an "independent" technical review?

There is an apparent conflict or perceived conflict in either:

1. Relying basically on the applicant for information while at the same time discharging the necessary "independence" responsibility; or

2. Not relying on the applicant for information while at the same time stating that the NRC does not select sites.

Legal Considerations

NEPA duties cannot be delegated by the cognizant federal agency. Greene County Planning Board v. FPC, 445 F.2d 412 (2d Cir.), cert. denied, 409 U.S. 849 (1972); Steubing v. Brinegar, 511 F.2d 489 (2d. Cir. 1975). Consequently, the NRC must be fully responsible for assuring that adequately complete and sufficiently accurate information is assembled to permit a reasoned analysis of alternatives, including alternate sites.

Pursuant to 10 CFR §51.20(a)(3), the NRC requires submittal in an Environmental Report by Applicants for construction permits of a discussion of alternatives to the proposed action, including [§51.20(d)] adverse data, as well as supporting data. These reports then are utilized in the Staff's NEPA review. When the ER is the primary initial source of Staff information, there must be sufficient independent Staff validation of the information to assure that the NEPA analysis is the ultimate and sole responsibility of NRC. Similarly, substantial weight may be given to the findings of regional, state, or local planning bodies, siting councils, and the like only so long as there is not delegation of the NEPA responsibility to "study and develop" alternatives to the proposed federal action.

The Commission has indicated a desire to defer to other federal agency expertise in the assessment of certain impacts; e.g., EPA expertise in evaluating aquatic impacts (CLI-78-1). It has also stated that "the fact that a competent and responsible state authority has approved the environmental acceptability of a site or project after extensive and thorough environmentally sensitive hearings is properly entitled to substantial weight in the conduct of our own NEPA analysis" (CLI-77-8, 5 NRC at 527).

The NRC Appeal Board in Seabrook emphasized the appropriate nature of NRC validation as they saw it by reference to review of all of the Applicant's statements with a "trained, dispassionate, and skeptical eye" which exhibits "vigorous probing for possible shortcomings." (ALAB-471 at 51)

Public Interest Considerations

Weight given to State and regional (agencies) sources of information and analysis will lend NRC support to the importance of such agencies.

Recognition should be made and weight given in some manner to analyses and decisions made by other recognized siting authorities.

NRC manpower requirements are a function of the degree of independence desired and the use that can be made of other recognized siting authorities.

Courses of Action

Option 1 - Conduct NRC's review in a manner that places primary reliance on information provided by the applicant, where the principal focus is to validate that information in a reasonable manner and provide appropriate assurance that the applicant has implemented a sufficiently good site selection process. This assessment includes the use of some information independently gathered by the staff.

Pros

Provides an acceptable probability of a sound decision.

Sufficiently flexible to adjust to case by case conditions.

Assessment procedures are technically feasible and relatively easy to apply.

Cons

Screening coarseness is of concern to hearing boards.

Public confidence in approach may be lower than for other options.

Option 2 - Much greater staff involvement in independent information collection and analysis.

Pros

Less concern about staff independence on part of hearing boards.

Higher public confidence in process.

Credibility of decision may appear greater.

Cons

Requires large increase in technical staff.

Duplicates applicant efforts to a greater extent.

On a technical basis the probability of a sound decision is not significantly increased.

Duplicates to a greater extent the involvement of other recognized siting authorities.

Option 3 - Early alternative site reviews - This option would involve NRC reconnaissance level analyses and decisions regarding alternative sites and the site selection process prior to the applicant's performance of detailed base-line studies. This is a procedural option as opposed to an "independence" option, thus it would be combined with either Options 1 or 2, above. This option does, however, have a bearing on the role of the NRC, since the NRC would impose its decisional process earlier.

Pros

Reduces the information imbalance and thereby bias in alternative analysis by not requiring (at that time) more than reconnaissance level information on the applicant's preferred site.

Reduces time pressure on staff and others in the assessment of alternative sites.

Reduces potential for applicant to sink resources into an environmentally less preferred site.

Cons

Risks continual attempts to reopen alternate site issue, which could render this option not viable.

May concern potential applicants because of land acquisition considerations.

Could conflict with State and other Federal agency (such as EPA) decisional processes.

Option 4 - A sequential staff signoff process whereby the staff would review the acceptability of candidate areas and of candidate sites before applicant selection of a proposed site. This option also is a procedural option which would be combined with either Options 1 or 2, above, and which also could be a variation of Option 3.

Pros

Provides for a greater assurance of ultimate staff approval of the proposed site.

Reduces information imbalance.

Prevents the applicant from committing resources where the site selection process (and thus perhaps the resultant proposed site) is found unacceptable.

Cons

Site selection process would take longer.

Would increase commitment of both applicant and staff resources.

Without hearing at each step some uncertainty of final decision still remains.

Would tend to involve the NRC more in site selection, which would be perceived as reducing "arms-length" independence.

Would tend to come closer to imposing NEPA on the applicant rather than the NRC.

Staff Consensus

The staff believes Option 2 "greater and more independent staff involvement" goes further than is required for a technically defensible independent assessment of alternative sites, would not add greatly to the protection

of environmental values, and is not warranted considering the increase in NRC resources which would be required.

The staff believes Option 3, "early alternative site review," is viable and has merit, although the rule change may need to include criteria to reduce the opportunity for relitigation. Such an option, however, should not be mandatory.

The staff also believes that a substantial postmortem of the Seabrook and other alternate site analyses must be made to provide an explicit understanding of what constitutes the scope of review under Option 1 as compared to Option 2. OELD believes that there needs to be a better understanding of the differences between Options 1 and 2 before it could be stated whether Option 1 is legally acceptable or Option 2 is legally required.

ISSUE NO. 2

Identifying the Region of Interest (ROI)

Description of Issue

The main issue is to establish which parameters are valid, appropriate, and sufficient to use as a basis for reviewing a "region of interest" (ROI) in the conduct of NRC's review of an applicant's, lead applicant's, or involved State agency's bounding of "the universe of sites". This issue involves the following subissues:

- What are the parameters which should be considered?

  An initial list might include the boundaries of the State or the applicant's service area, population levels, applicant's present and projected generating capacity and power deficient regions, projected power pool supply and demand factors, multiplicity of environmental settings or resources areas, and institutional factors.

- How should these parameters be applied?

  Threshold levels could be established for each of the applicable parameters which are then consistently applied in all cases.

- What role should be given to environmental as opposed to internal technological and financial considerations?

- What role should be given to institutional constraints and regional equity?

Technical Considerations

- Difficulty in defining the ROI based on assumptions and forecasts as to load centers, grid stability, service reliability, and interutility power exchanges.

- Difficulty in assessing importance of institutional factors, such as ability of utility to finance facilities outside of service area or state and ability for utilities to obtain necessary permits.

Legal Considerations

NEPA requires that reasonable alternatives to the proposed action be studied and developed by NRC. Therefore, the original geographic scope of the alternate site analysis must reflect the geographic range of sites where one would reasonably consider siting the proposed facility. Since circumstances of ownership, transmission infrastructure and patterns of demand vary from project to project, any rigid definition of region of interest may, in a given case, fail to meet the test of reasonableness.

Past NRC adjudicatory decisions have focused upon the lead applicant's service area as reasonable in cases where no special circumstances exist (Bailly, ALAB-224) and upon a broader approach when region-wide transmission grids and region-wide expected uses of the proposed power are part of the circumstances [Seabrook - CLI-77-8 and CLI-78-(June 30, 1978)].

Public Interest Considerations

- Possible institutional conflicts.

- Regional equity, such as diversion of land, water and other resources as well as stresses imposed on community facilities in one region for the benefits or increased electrical supply in another region.

- Possible impact on ratepayer of facility siting in area remote from loads to be served.

- Staff and other resources expended in review of extended search areas compared to improvements gained in environmental quality.

Courses of Action

Option 1: Largest reasonable ROI, such as service area of applicant plus service area of regional power pool and/or all intertie utilities.

Pros

- minimize litigative risks
- maximize assurance that all available environmental resource alternatives have been included
- eliminate need for iteration during latter stages of study

Cons

- cumbersome and perhaps technically unnecessary
- may be wasteful of utility and staff resources
- likely to include areas with institutional bars to siting

Option 2: ROI defined by site search, conducted by examining areas extending outward from load center(s) until adequate number of suitable sites, incorporating a variety of environmental resources, are discovered.

Pros

- environmentally focused choice
- technically rational - once reasonable group is developed, further search yields diminishing returns

Cons

- residual risk that preferable sites have been overlooked
- increased litigation risk

Option 3: ROI defined as State and/or service area, expanded or contracted as necessary until adequate number of suitable sites, incorporating a variety of environmental resources are discovered.

Pros

- likely to avoid institutional bars
- environmentally focused choice
- technically rational

Cons

- residual risk that preferable sites have been overlooked
- increased litigation risk

Option 4: Bypass ROI and go directly to defining candidate areas using specific criteria, provided a variety of environmental resource areas are encompassed. Appropriate criteria might include:

a) Watersheds, water availability
b) Transmission distances and existing grids
c) Institutional factors
d) Sensitive environmental areas

Staff Consensus

The staff has concluded that any of the above options may be defensible on a case by case basis. The overriding criterion is that the identification of candidate sites must be accomplished in an environmentally sensitive manner to provide reasonable assurance that an environmental resource area was not overlooked that might have yielded a site that is obviously superior to any of the candidates. Also, the staff has concluded that the size of the ROI considered (and thus the amount of data required and extent of analysis) should be commensurate with the likelihood that an "obviously superior" siting alternative would be identified, if a larger ROI were considered.

ISSUE NO. 3

The Process of Identifying Candidate Sites

Description of Issue

What are acceptable methods and criteria for screening candidate areas and winnowing of sites which reduce the number of comparison studies to a number which permits detailed and reasoned comparison? What should this number be? Should criteria differ to reflect contrasting regional/utility situations. When are candidates "among the best that could reasonably have been found?"

Technical Considerations

There are several fundamental technical problems associated with the site identification and screening process.

1. The universe of possible locations is often (though not always) very large. For example, it is not uncommon for such areas as watersheds, service areas or states to be in excess of 10,000 square miles. Hence, screening methodologies appear techically attractive; however, total search procedures are not out of the question.

2. It is difficult to define screening criteria that avoid the appearance of bias while limiting the region of search. However a search is

conducted, it is open to criticism on the grounds that an expanded search might have yielded better candidates.

3. In the staff's experience, the implicit assumption that good sites are difficult to find is usually not true, based on purely technical standards.

4. Because of the essential environmental equivalence to the proposed site of at least some sites in any group an applicant may offer, the staff has found it technically difficult to defend the chosen site as genuinely different from all others. Staff credibility becomes an issue because there is usually no firm technical basis for rejecting closely competing sites, yet such rejection has frequently become the accepted method for recommending acceptance of the proposed site.

Legal Considerations

A process of limiting the range of alternative sites to a finite number of specific candidate sites would appear to satisfy the NEPA mandate to study and develop reasonable alternatives to the proposed action so long as the screening process preserves full consideration of the basic alternative of siting the facility elsewhere in order to preseve and protect

environmental values. Consequently, the legal test to apply to the screening process is whether it functions to promote the goal of studying and developing environmentally desirable alternatives. To meet this task, the screening process must take care not to (1) mask environmental considerations by emphasis on non-environmental matters, (2) bias the process in favor of the proposed site, (3) make the process so coarse or information-weak that environmental considerations are inadequately reflected.

Among the potential screening methods which could run afoul of the legal requirements are methodologies which (1) are primarily motivated by many traditional utility siting objectives, such as engineering ease or ease of property acquisition, (2) employ regional assumptions without adequate study to assure that the assumptions actually apply to all sites in the region involved (See Pilgrim, ALAB-479), (3) bias the process in favor of sites so homogenous that no "range" of environmental alternatives is discovered, and (4) use the "obviously superior" standard as a screening methodology as well as a basis for final comparison of the proposed site with the final slate of candidate sites. (See NECNP v. NRC, Docket Nos. 77-1219, 77-1306, 77-1342, and 78-1013 (August 22, 1978) at p. 13 of slip opinion. See also Pilgrim, ALAB-479 at 20-21.)

Public Interest Considerations

1. The staff is uncertain how the cost of information, screening, and assessing sites and the societal penalty for error should enter into limiting the scope of the search and the number of sites considered.

2. The staff is concerned that the public interest might not be served by extreme emphasis on alternative site analysis, since the staff believes that the environmental penalty for failing to locate an obviously superior site is not always great. Sites not identified remain available for future use. Also, the NRC cost benefit analysis cannot fully reflect competing uses for resources, so in the overall context it is really not clear whether an "obviously superior" site for nuclear usage really is "obviously superior" when considering all competing uses.

Courses of Action

The staff has considered options which vary in cost, time for implementation, degree of certainty of the result, appearance of bias, and technical defensibility.

Option 1: Establish criteria for an environmentally sensitive screening or site location process, for example:

Suboption A: Minimize prior screening and require an essentially total search, comparative process. This would involve superimposing a grid (mesh of one square mile) over the region of interest and then assessing on a comparative basis every element of the grid one by one.

Suboption B: Require a multistage screening process which ultimately results in a relatively small group of sites (say 5 or 10) which can be assessed in detail.

In this process criteria would be established which would permit concentrating the search in the areas most likely to yield acceptable sites without need for examining each location one by one.

The region of interest would be subdivided into several resource areas by broad criteria such as availability of water or avoidance of metropolitan areas. These areas would then be screened using successively more detailed criteria until a small group of surviving sites is obtained. The site-specific attributes of these would then be weighed and balanced to determine whether obviously superior sites within the surviving group exist.

This would be a workable process which theoretically would result in the ultimate identification of sites that are among the best that could

reasonably have been found. It would require development of a large set of successively more detailed selection criteria, however.

Appearance of bias could be avoided to some extent by requiring the site search to be conducted within several resource areas with at least one site brought forward from each area. As the screen becomes finer, however, the quality of remaining sites improves and the reasons for rejection of candidates in order to accomplish further screening become more controversial and result in only marginal improvement in protection of environmental qualities.

Suboption C: Require a statistically-based selection procedure. This procedure would rely on established principles of statistical stratified sampling. Criteria would be established for defining resource areas of relatively homogeneous land and water use characteristics. From these, statistically valid samples could be drawn which would reflect the environmental attributes of the resource area. The sample of sites would include both good and bad places in about the same proportion as they exist in the resource area. This would enable the screening of the sample instead of the whole area.[1/]

1/ Stratification by resource area could conceivably reduce the previously mentioned 10,000 sq. mile area by as much as 90%. A few percent sample size requirement would thus correspond to about 20-40 sites which should reflect the range of environmental attributes available in the selected resource area. The number of sites for final comparison would vary with the degree of stratification possible within the original unstratified area.

In this way time and resources needed for analysis could most productively be brought to bear on relatively few sites which are known to be representative of the resource areas.

A statistical method enables rigorous specification of sample sizes (number of sites) for specified levels of confidence. It also provides rigorous justification for limiting the search process within a resource area, since a second or third sample does no more than provide estimates of resource area parameters just as the first one did.

Adoption of a statistical method would require acceptance of probabilistic assurance of quality in the candidate groups. The process could not be used to locate a "best site" but would be effective in meeting the criterion "from among the best that could reasonably have been found."

Pros (for Option 1)

1. The establishment of an environmentally sensitive screening process would reduce the likelihood of unintentional bias and would likely improve credibility.

2. Suboption A would be comprehensive and would have the highest probability of identifying the "best" site, assuming there were agreement as to the desired qualities of the "best" site.

3. Suboption A combined with the largest ROI would essentially answer all technical and legal criticisms regarding site selection and would be technically feasible.

Cons (for Option 1)

1. Suboption A is inefficient, inordinately expensive, and would require development of a computer routine and complete data base for implementation.

2. Screening parameters and assigned weights for any screening process would be controversial.

3. Intentional bias (preselection) could be difficult to prevent or identify in any reasonable NRC review of screening methodology.

4. Screening processes which result in large numbers of individual site comparisons are difficult to justify on a benefit-cost basis; i.e., the benefits to overall environmental protection arguably decrease quickly.

5. It is questionable whether imposing environmental considerations in the initial screening process would be cost effective in the enhancement of environmental protection, since criteria used for early screening based on non-environmental considerations likely would not significantly narrow environmentally sound siting options.

Option 2: Accept any reasonable screening process provided candidate sites meet previously established standards of environmental quality.

In this process, primary focus is on the results of the search. The applicant may bring forward a small group of sites (say 5 or 10) which meet reasonable pre-established threshold environmental standards. Detailed weighing and balancing would be performed on this group to fulfill the NEPA obligation to examine alternatives.

This method is about equally dependent on threshold standards and comparative evaluations. Adopting it would require rejection of the concept of an exclusively comparative decision mode (Suboption 1.A). It also is based on the premise that in most cases screening methods which explicitly include early consideration of environmental factors serve no genuine environmental purposes, whatever their merit when tested procedurally. This option is based on the technical judgment that a slate of candidate sites that meet reasonable threshold environmental criteria is likely to contain sites that environmentally are among the best that reasonably could have been found.

Pros

1. In the staff's technical judgment, the process is a close match to technical needs.

2. The process of establishing standards follows concepts of environmental standards pursued in other areas of environmental protection.

3. The extent of the study is bounded.

4. The process is results oriented and could limit unproductive debate over methodology.

5. Offers better predictability of the NRC review process than Option 1.

Cons

1. Could run a higher risk that comparatively superior sites will be missed or that bias (unintentional or otherwise) may be not detected.

2. Criteria may vary from region to region and would have to be more rigorous than in Option 1.

3. May require specification of minimum number of sites, but this is likely under Option 1, also.

4. As specified may be interpreted as not complying with the law, although it is not clear that NEPA requires exclusive reliance on a specific site-by-site comparative methodology. In this respect, it is clear also that suboptions B and C of Option 1 also rely to a large extent on a noncomparative methodology.

Staff Consensus

Applicants should be given a range of options for site selection. A form of Option 1 may be best when the candidate sites are likely to vary significantly in overall quality (i.e., in situations where it may be difficult to demonstrate rather uniform resource areas). Option 1 would also likely be best when there are likely no sites available that could meet all (or nearly all) of the important threshold standards.

It would appear that Option 2 is a close match to technical needs and could be a useful option in situations where there is likely to be a number of good sites available. If, in this situation, the threshold values could be set stringently enough, it could be reasonably demonstrated that sites meeting these threshold values would be among the best that reasonably could have been found.

The question of how many candidate sites to require is not addressed specifically in this paper, and it is doubtful that a particular number

could readily be agreed upon. However, it appeared that the range might be from three to ten, and there seemed to be a consensus that there should be at least one site from each major resource area within the ROI.

ISSUE NO. 4

CRITERIA FOR DETERMINING THE "OBVIOUS SUPERIORITY/INFERIORITY" OF THE ALTERNATIVE/PROPOSED SITE

Description of Issue

When is a candidate site "obviously superior" to an alternative site? How can the concept of "obviously inferior" be best utilized to focus the alternative site review along a more useful and efficient path? How does one "measure" the worth of and appropriately balance on a commensurable basis the various factors affecting site selection, many of which are not quantifiable? Should the NRC restrict its analyses to those alternative sites identified by the applicant (assuming that the applicant utilized an acceptable screening/winnowing process)? If not, under what circumstances (or decision criteria) should comparisons of other sites be made by NRC?

Answers to the above questions clearly are dependent on decisions regarding the region of interest, the screening process, and data requirements -- issues that are discussed in other enclosures. Answers also are dependent

on technical definition of the magnitude[2/] and certainty of environmental impact which would warrant tripping the "obviously superior" criterion. To develop such definitions will require substantial additional time as well as staff (and perhaps contractual) effort.

What are or should be the underpinings to the "obviously superior" criterion? There are three possibilities: the inherent imprecision of cost-benefit analyses using unquantifiable factors; the likelihood that if more information were obtained for the alternative sites additional site defects would be discovered; and the role that NRC should play in the site selection and approval process. The first two formed the basis for the Commission's and First Circuit's decisions in Seabrook.

2/ In the consideration of alternative sites for the Sterling Power Project, the Appeals Board on October 19, 1978 (ALAB-502 at 23) stated:

> "Indeed, were we called upon to determine on the record brought to us which site was on balance the best choice from an environmental standpoint, our task would be a most difficult one. All that we must decide is whether Ginna is "obviously" -- in other words, clearly and substantially -- superior to Sterling."

The choice of bases for the "obviously superior" standard is of more than academic interest. If, as the staff holds, the existence of more information regarding the preferred site plays the smaller role in the choice of decision standard, then it makes a lesser difference when the standard applies (applicant's site selection process or NRC's own site evaluation process), NRC's duty to use efforts to quantify environmental factors is emphasized, and a small but nevertheless measurable superiority could be grounds for rejecting an applicant's preferred site. On the other hand, if disparity of information plays the critical role, then NRC is under a duty to reduce data uncertainties to some reasonable level; and it becomes important when the standard applies, because at some early stage of the applicant's site selection process there is equivalent data available for the preferred site and alternative sites and it would be illogical to apply the "obviously superior" criterion. Also, small but measurable superiority should not compel rejection of the preferred site because, in theory, the missing information about alternatives would reveal additional defects that would outweigh the slight superiority.

The purpose of this enclosure at this time is not to attempt to resolve this issue. It is only to present two of perhaps many possible modes of implementation of the "obviously superior" criterion to stimulate further discussion. The first is the present-day, process-oriented approach which would always evaluate first the applicant's site selection process

and then employ the "obviously superior" standard in a comparative evaluation with the alternative sites. The second is a possible, results-oriented approach that focuses first on the qualities of the proposed site and on the employment of the "obviously superior" standard in a comparative evaluation with the identified alternatives. Only if "obviously inferior" qualities are identified at the proposed site would the applicant's site selection process be evaluated. It should be noted that this second approach would not require the NRC to determine whether the candidate sites were "among the best that could reasonably have been found," unless the proposed site had some "obviously inferior" qualities.

1. PRESENT-DAY IMPLEMENTATION OF THE "OBVIOUSLY SUPERIOR" STANDARD UNDER NEPA

In discussing its reasons for promulgating the "obviously superior" standard for comparing alternative sites to the site proposed by an applicant, the Commission focused on the potential that the appearance of slight superiority at an alternative site may be a function of the uncertainty of comparative analyses and/or incompleteness of information rather than a real difference between the sites. In other words, if all the salient features of the various sites (both alternates and the proposed site) were completely understood, and if the comparisons could precisely quantify these features, then perhaps a measurably small[3/] difference

3/ This is arguably different from a formulation that would require rejection of the preferred site only if the alternative site was substantially better.

between the two could nevertheless warrant preferring the alternate site. The "obviously superior" notion is designed to take account of the uncertainty which is involved in the comparison. It is analogous to the confidence interval about an empirical estimate, i.e., that empirical range within which the correct estimate is likely to lie some acceptable percentage of the time. The analogy is imperfect because evaluation of the characteristics of potential sites is not susceptible to statistically testable empirical estimation.[4/] Consequently, "obviously superior" alternatives are those which are actually superior; i.e., the differences are real and not merely a function of either the limited quantity and quality of information available at the alternative site(s) as compared to that available at the proposed site or of the limitations of cost-benefit analysis. In light of these considerations, the NRC staff must consider adequacy of information (Reference Issue 5) and seek to refine cost-benefit analytical techniques to minimize, where reasonable, these inherent uncertainties. Only after the uncertainty is reduced to the reasonable minimum should the Staff be concerned with whether the remaining differences render the alternative site(s) obviously superior.

[4/] This notion of the question of confidence that differences are real is highlighted in the recent First Circuit decision: "The [obviously superior] standard is designed to guarantee that a proposed site will not be rejected in favor of a substitute unless, on the basis of appropriate study, the Commission can be confident that such action is called for." NECNP v. NRC, Docket Nos. 77-1219, 77-1306, 77-1342 and 78-1013 (August 22, 1978) at 13 of slip opinion, emphasis added.

The Commission has expressly stated that Licensing Boards should reject proposed sites "not when some alternate site appears marginally 'better' but only when the alternative is obviously superior" (CLI-77-8, 5 NRC at 530). The Commission further stated in a footnote that the NEPA analysis of alternatives is to be conducted without regard to this standard. The First Circuit Court of Appeals reflected this intent in its observation in NECNP v. NRC, Docket Nos. 77-1219, 77-1306, 77-1342 and 78-1013 (August 22, 1978). "The obvious superiority standard . . . says nothing about whether or how the required studies will be performed. Rather it goes to what the Commission will do with findings that the studies will generate." (Slip opinion at 13) An NRC Appeal Board, in Pilgrim (ALAB-479), has interpreted that the obviously superior test "comes into play after alternatives have been identified and their salient features explored." (ALAB-479 at 20-21)

Based upon the above-described underlying considerations, Appeal Boards apparently have concluded that the "obviously superior" standard does not provide direct guidance as to how the alternate site review process is to be conducted, but comes into play as a "final" comparative standard. Under their view of the requirements of NEPA to "study and develop" alternatives, the Staff is responsible for assuring (either directly or by independent review of work done by applicants) that a complete process of developing alternative sites is used. The process suggested by the staff would be along the lines of (a) determining the region of interest;

(b) developing a process for screening from among the universe of potential sites to a manageable group of sites which are "among the best that could reasonably be found" in the region of interest; (c) engaging in detailed study of reconnaissance-level information to thoroughly investigate the relevant features of the slate of sites to determine whether alternate siting would offer environmental preference over the proposed site; and (d) where environmental preference could be expected from alternate siting, engaging in a full cost-benefit analysis to determine whether the alternate site is, in fact, "obviously superior" to the proposed site.

This approach to implementation of the "obviously superior" standard is supported by the NRC staff as an acceptable methodology. As discussed below, however, some staff members believe that a different methodology is also acceptable under NEPA and the "obviously superior" standard.

2. IMPLEMENTATION OF THE "OBVIOUSLY SUPERIOR" STANDARD FOR ALTERNATE SITE COMPARISON BY INITIAL FOCUS ON THE PROPOSED SITE

In promulgating its standard for alternate site comparison, the Commission recognized that both applicant and NRC have available to them much more information about the site for which a specific project is proposed than about potential alternative sites (CLI-77-8). The First Circuit Court of

Appeals also took note of the same fact (NECNP v. NRC at 13 of slip opinion).[5/]

These decisions also both took note of the fact that the investigation into potential alternate sites is undertaken by the NRC so that it can make an environmentally sensitive decision about the site before it, rather than for the purpose of selecting a site for the facility. Given these two realities, plus the fact that no site selection process can provide complete assurance that there is no obviously superior site and the fact that forward cost analyses will realistically tilt the decision somewhat in favor of the proposed site, it may make sense for the alternate site inquiry to focus first on the site for which licensing is proposed. Since the criterion for rejecting that site will ultimately be whether an alternate site is obviously superior to it based on a cost-benefit analysis, the characteristics of the proposed site are necessarily fundamental to the analytical process. Further, the prospect that an obviously superior site could be found is necessarily a function, among other things, of the potential for undesirable impacts at the proposed site.

5/ The Commission and the Court have expressed the opinion that more information increases the probability of detecting blemishes at the proposed site. The Staff holds the opinion that such blemishes likely would not affect siting decisions to any great extent since few, if any, additional significant NEPA problems are likely to be identified after an adequate reconnaissance level investigation. The detailed baseline information is valuable primarily for accurately defining the extent of mitigation required for previously identified problems, although it also provides confirmation as to whether there are other substantial impacts that could warrant rejecting the site in favor of an alternative.

In light of these realities of information availabilities and analytical and administrative processes, some members of the NRC Staff strongly favor an approach to the alternate site inquiry which focuses first on the proposed site; i.e., an approach that is more results-oriented as opposed to procedure-oriented. For many environmental parameters, it appears feasible to describe levels of impact on a regional basis which are as small as might reasonably be anticipated given that a nuclear facility is to be constructed at all. For such parameters, threshold levels at the low range of expected impacts could be designated below which it is unlikely that shifting to another site could further reduce the impacts to such an extent that such a site would be deemed environmentally preferable. By focusing upon the impacts at a proposed site in terms of such threshold levels, the NRC Staff could reach reliable initial judgments about the environmental soundness of the proposed site. This analytical process could then be utilized in deciding the scope, effort, and rigor to be devoted to the NRC task of "studying and developing" alternative sites. It is envisioned that, where the proposed site does not exceed any threshold levels, the review performed by the NRC would be to assure that the alternative sites represent at least two resource areas and to perform a comparative examination of the proposed site and the identified alternatives. Where, however, the environmental consequences of siting at the proposed site clearly and substantially exceed one or more threshold levels for important environmental parameters (or

where there is unusual uncertainty about the expected impacts), the NRC would review the site selection process to the degree necessary to provide reasonable assurance that obviously superior alternatives were not precluded.

The same logic would dictate the wisdom or necessity of expanding the scope of the search (ROI) for alternatives. The logic of the above is that when an investigation of the proposed site in the utility-preferred general area for a facility reveals impacts that do not exceed reasonable threshold levels of environmental impact, the environmental penalty for limiting the scope of the alternate site inquiry is small compared to the public cost incurred in inquiring further into this matter. On the other hand, when the applicant's site selection process fails to uncover a site with environmental impacts at the low range of expected impacts from nuclear power plants in that region, the importance of inquiring further into the site selection process and perhaps also expanding the search for sites is apparent. The ultimate geographical bounds on such a process-oriented review would be the point beyond which it would simply not be reasonable to go, for reasons of transmission distances, lack of relationship between generation site and use of the power, and the like (Ref. Issue Nos. 2 and 3).

In summary, where the anticipated impacts at a proposed site is below reasonable threshold levels, the environmental benefits of extensive, complex methodologies for locating and analyzing further alternatives are

likely to be small. However, the probable environmental benefits are likely to be greater when the proposed site is manifestly inferior in some way or ways (i.e., above threshold levels).

The process herein described should not be confused with the analysis of whether a proposed site is environmentally acceptable. In regions where it is subsequently determined that any nuclear power plant site will likely exceed the described threshold levels (and where no alternative technology is a superior alternative), a site may well be approved despite such impacts. However, the search for alternative sites in such an area will have been a rigorous one and the environmental acceptability of the proposed site will be based upon a reasonable assurance (i.e., an acceptable risk of error) that there is no obviously superior site.

The usefulness and environmental defensibility of this process depend considerably upon the appropriateness of the designated threshold levels. If the thresholds are set at too low a level of impact (i.e., at de minimus impact levels), all sites would exceed one or more levels of impact, and thus the process would be meaningless. On the other hand, if the levels are set at too high a level of impact, the process would not be sensitive to environmental protection. The Staff members who support this approach believe that appropriate thresholds can be set, although the task will be a difficult and controversial one.

Staff Consensus and Differences

There is no staff consensus on the alternate methods of implementing the "obviously superior" standard. While two "options" were presented in this enclosure, there clearly are other options available for discussion purposes, and the primary objective is to open dialogue with the Commission in the area to obtain guidance whether to pursue the line of thought represented by the second option. The only staff consensus is that, where the applicant has proposed a good site (i.e., one with no inferior attributes), it is not in the public interest for the NRC process to focus great attention on the merits of the site selection process that led the applicant to the proposed site.

An example of divergent opinion that exists regarding the second option is described below. The option, as written above, describes a process that first focuses on the qualities of the proposed site. If no obviously inferior qualities are identified[6/] and the proposed and alternative sites represent at least two resource areas, the merits of the site selection process would not be evaluated. However, the proposed site would then be compared to the identified alternatives to determine whether one of the alternatives is obviously superior. There are at

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6/ As measured against predetermined thresholds of impact which would be set regionally and would represent a low level of impact for each parameter, given that a nuclear power plant will be built and operated.

least two suboptions to the above that received some support by various members of the staff, as follows:

1. The first sub option is one where an additional criterion is imposed as a prerequisite for not inquiring into the merits of the applicant's site selection process. This criterion would require that at least one of the identified alternative sites in another resource area also not have any identified obviously inferior qualities. The purpose of this is to give added assurance that the alternatives are not "straw men" to make the proposed site look good.

2. The second sub option is one which would not require the final comparative evaluation against the identified alternative sites. This option would suffer a higher degree of litigative risk, because it would appear on the surface to circumvent the NEPA-required consideration of alternatives. However, it is felt by some, that a defensible rationale could be logically developed that the setting of environmentally-sensitive thresholds in and of itself inherently represents a consideration of alternatives; i.e., poorer alternatives are automatically rejected. Also, it is felt by some that a site that met such reasonable threshold values would be sufficiently good that, in all likelihood, it would be environmentally equivalent to any other alternative that also met the thresholds; i.e., the final

comparative evaluation, even if the alternatives also met the threshold values, would likely not result in the identification of an obviously superior alternative.

ISSUE NO. 5

Information Requirements for Siting Analysis and Decisions

Description of Issue

What is the nature and extent of data and analyses required to comparatively evaluate alternate sites with an acceptable level of confidence in the site selection? What is the extent that any site dependent plant features need to be worked out?

Legal Considerations

NEPA requires that federal agencies collect and study information necessary to reach a rational decision, but not that they conduct exhaustive studies beyond those sufficient for sound decision-making. Cape Henry Bird Club v. Laird, 359 F. Supp. 404, 421-22 (1973), aff'd 484 F.2d 453 (4th Cir. 1973). See Louisiana Environmental Society v. Brinegar, 407 F. Supp. 1309, 1322 (W.D. La. 1976); City of North Miami v. Train, 337 F. Supp. 1264, 1272 (S.D. Fla. 1974). Both the Commission (CLI-77-8) and the First Circuit Court of Appeal [NECNP v. NRC (August 22, 1978) at 13 of slip opinion] have emphasized that far closer environmental scrutiny of the proposed site will have been performed than is feasible at alternative sites. Consequently, the amount of information required must be sufficient to permit a reasoned analysis of the alternative of siting the facility elsewhere but need not be sufficient to permit a full-blown NEPA analysis of an alternative site as if it were the proposed federal action.

NRC adjudicatory decisions promulgated by Appeal Boards have provided some examples of the level of detail they regard as appropriate:

1. Habitat - ALAB-479 at 24.

   "Whether the elimination of a 'wildlife habitat' is to be condemned hinges on whether one is talking of eagles 'nests or rodents' nests. The significance of the destruction cannot be evaluated without some indication of the nature of the habitat, the types of species, and the extent of destruction involved, to suggest but a few matters."

2. Aesthetic effects of cooling towers - ALAB-471 at 54, 60.

   at 54 "Another site-related variable, of course, is the number of residents and tourists to whom the towers or their plumes would be visible." (A lengthy footnote then distinguishes among permanent and summer residents, over-night and daily transients).

3. Meteorologically dependent effects of cooling towers -ALAB-471 at 51, 52.

   at 52 "...the significance of having and properly analyzing meteorological data for the site in question."

4. Socioeconomic impacts - ALAB-471 at 57, 58.

   at 58 "Without examining into the particular facts of each community's situation, no one can be ... certain what disadvantages will accrue" (The previous page discusses governmental services - fire, police, education - local economy and tax structure).

5. Population density - ALAB-471 at 59.

Insufficient detail risks an illegally biased review process as it interacts with the "obviously superior" standard to the extent that the "obviously superior" standard is designed to reflect the uncertainties due to information gaps (as opposed to uncertainties in cost-benefit balancing) when comparing a proposed site to an alternative; i.e., the

presence of substantial information gaps may make it harder to apply the obviously superior standard.

Discussion

Guidance and policy exists (Reg. Guide 4.2, Reg. Guide 4.7, Environmental Standard Review Plans) defining information to be provided for alternate site analysis on the basis of reconnaissance level information (RLI). The nature and extent of data and the analyses to be performed on this data are partially stipulated in the guides. The staff has undertaken a technical assistance program to define the need, applicability, proper utilization, scope, source of information, and content of RLI. There is general agreement that the staff's analysis will not be satisfied by cursory gathering of miscellaneous data but will involve a review of available relevant literature, unpublished data available from qualified experts, inspection of the site by qualified experts, and utilization of relevant records from state and local agencies. The RLI will not include the detailed time-dependent studies normally performed to provide a baseline of information at the proposed site.

The staff document being developed on RLI will attempt to develop criteria by which to judge the adequacy of that information, i.e., how much information is enough. This will require the development of "gating criteria" by which the applicant and reviewer may judge whether enough information has been acquired to support a defensible decision concerning each of the environmental factors of concern.

The RLI must provide a basis for two levels of staff analysis. The first is screening; the second is comparative analysis. RLI will also provide insight into possible mitigation of environmental impacts that could offset apparent inferior quantities of a site.

An obvious question arises concerning NRC site evaluation procedure, if adequate reconnaissance level information does not exist. This question would likely have little significance since it is probably valid to assume that in the large majority of cases environmental information tends to exist and be available in proportion to the human esteem of the resource. The broad array of environmental interests, e.g., fishing, hunting, hiking, recreation, birding, etc., that have sizable constituencies makes it unlikely that there would be complete ignorance of any major valued resource.

The amount of information gathered on each alternative site must meet tests of adequacy, which could be provided by the 'gating criteria' mentioned above. Enough information must be available to insure an acceptable level of uncertainty about the validity of the decision at each site. The amount of information required will vary according to the degree of difficulty in predicting impacts, and the degree of importance of an impact to the overall decision regarding alternative sites. In cases where it is not clear that enough information was utilized to assure an acceptable level of confidence in the decision, it would

probably be better to err on the side of too much data rather than too little. This is because of the stress NEPA places on the need for full environmental disclosure.

There are sound reasons to limit the amount of information gathered. Environmental factors which demonstrate random properties (e.g., larval densities, fish population) have a fundamental range of variability through time and location that can not be reduced by additional data gathering. The only benefit of gathering more data on these kinds of characteristics would be to reduce sampling error and to improve our estimates of how large this variability is. Further, the methods for sampling natural populations have a degree of uncertainty in their results that, when coupled with the state-of-the-art to predict environmental impacts, provide additional limitations on the amount of data useful for alternate site evaluations.

There are also economic constraints on the amount of data that should be collected for alternative site analyses. There is clearly a cost to the review and analysis of information that must be reasonably balanced against the likelihood of significant improvement in the overall protection of the environment. Also, there is obviously a trade-off between the amount of information and analysis to be done at each site and the number of sites that can be treated within a reasonable level of manpower commitment. It would be counterproductive to force either side of this balance

to increase to the extent that the other would be reduced below an acceptable level of confidence in the results. For example, while meteorological data is relatively inexpensive to obtain for a region that could encompass a potential alternative site, application of analytical codes to resolve site-specific uncertainties is expensive. Guidance is needed concerning appropriate limits of site specific analyses required of such data at each site under evaluation and how such tradeoffs should be properly balanced.

The second major portion of this issue concerns the extent to which site specific impacts need to be worked out at the alternative site evaluation stage of the licensing process. RLI would not provide details on a specific site for some areas of technical review (e.g., the presence of an endangered species or a special archeological feature).[7/] However, the alternate site review process would not be inappropriately biased, because the failure to discover such details would not likely favor the proposed site.

In summary, the staff has identified several important questions regarding the extent and use of information in the review of the applicant's site selection. These questions are:

7/ RLI could indicate that suitable habitat for endangered species might be affected or the potential for a special archeological resource.

1. The degree of assurance that must be achieved in predicting impacts of significance.

2. The amount of information that is required to provide the necessary degree of assurance (i.e., when can reasonable limits be placed on the amount of reconnaissance level information and analysis).

3. The role that threshold levels of impact can play in the determination of how much information is needed.

4. The extent to which detailed regional and/or site specific data must be collected and analyzed.

5. The extent to which the mitigation of impacts should be considered in alternative site analyses.

Staff Consensus

The staff generally agrees with the philosophy that NEPA's full disclosure requirement should not demand identifying all reconnaissance level information on all subjects of interest to siting and the subsequent detailed analysis of all these data. Both the amount of data required and the extent of analysis should be matched to the importance of the impact and the degree of certainty required as to the likelihood and magnitude of impact.

The paper proceeds on the premise that an adequate alternative site evaluation can normally be performed using so-called "reconnaissance level information." NEPA does not specify the level of information required for alternative site evaluations, but NEPA has been construed to mandate a kind of balancing test with regard to data gaps--significant data gaps should be remedied if the benefits of obtaining the information in terms of reducing uncertainty exceed the costs, including delay costs, required to obtain the additional data. This suggests that no inflexible standard can be adopted to the effect that no more than reconnaissance level information can ever be required.

ISSUE NO. 6

Reevaluation of the Alternative Sites Issue After Plant Construction Has Begun

Description of Issue

Is there a point in the plant construction process (after CP issuance) at which reconsideration of alternative sites should be precluded except soley on the basis of site suitability?

At the OL stage it has been proposed and is a premise of this NUREG that alternative sites not be rereviewed unless there is a reasonably meritorious argument that a forward looking cost-benefit analysis could result in rejection of the proposed site. Thus, in practical terms, the grounds for rereview of the proposed site would essentially rest on the issue of site suitability. At present, after issuance of the CP, any rereview of the proposed site would be based on:

a. new information that the proposed site is unsuitable, or

b. new information relevant to the issue of alternative sites,[8/] which then would require a rereview of the alternative sites and a decision based on NEPA balancing which appropriately considers forward costs (i.e., economic and environmental costs of proceeding at the proposed site compared to an alternate site).

8/ Ref. 10 CFR 51.21.

Technical Considerations

There are no technical problems associated with the preparation of a cost-benefit analysis of the alternative site question which considers forward costs.

Legal Considerations

At some point after issuance of the CP, the alternative of siting it elsewhere will no longer be a reasonable alternative for purposes of NEPA. However, that point may be very late (even OL or operating stage) if some fundamental question of site suitability arises. Otherwise, the evaluation of when it becomes unreasonable to consider alternate siting will depend on the point at which comparative forward costs and comparative proximity to the provision of needed (or desirably substitutable) power so favor the partially constructed site that there is no real possibility that an alternative site could be obviously superior to it.

Public Interest Considerations

The reason for possibly limiting the grounds for site rejection at some point after CP issuance is the magnitude of resources committed to the project; i.e., after the plant is essentially built, the likelihood that the cost-benefit analysis would result in rejection of the proposed site is vanishingly small. If this premise is true, then the funds committed to reevaluate the alternate sites are not cost effective.

Courses of Action

The only course of action (other than status quo, or a change that suggests a meritorious cost-benefit reason for reevaluation) would be to determine whether there is a useful cutoff time after CP issuance when the site rejection criterion should become solely a question of suitability or should be narrowed using some other criterion. This could be done either by specifying the percent completion of the plant or by establishing stricter standards for reopening this question. This is one of several issues recently affirmed by the Commission (NUREG-0499) for consideration in a rulemaking. Also, a group of utilities have filed a petition for rulemaking on this and other OL review subjects. Further recommendations in this area will await public comment.

ISSUE NO. 7

Consideration of Alternate Sites for Applications Involving Pre-approved Sites

Statement of Issue

If an application is submitted for a site or for utilization of a pre-approved site in a region where there are one or more additional pre-approved (or "banked") sites that might conceivably be used in satisfying the same need for power, the NRC would be faced with the problem of whether and perhaps how to apply the "obviously superior" test. A possible (and perhaps likely) interpretation could be that the NRC could or should require rereview to determine proper sequencing (i.e., may have to reject use of one pre-approved site in favor of another). Another ramification is that the "obviously superior" test arguably may not even be operative, since equivalent detailed information would be available on all pre-approved sites.

Technical Considerations

A systematic site selection process which has an expanded "region of interest" should identify potentially viable candidate sites. A finding of environmental equivalence, i.e., no site is environmentally preferable

to any other, for such a group of sites should be sufficient to preclude any consideration of sequencing at a later date. Restricted regions of interest for Early Site Reviews or possibly changing standards for the review of alternative sites, however, would make it more likely that obviously superior alternatives exist which had not been considered in review of the pre-approved site. The likelihood of an additional pre-approved site which had never been compared to the proposed site, and thus could be obviously superior, would thus be increased.

With regard to the second point (i.e., the applicability of the "obviously superior" test), the judgment of technical staff is that the cornerstone of this test is the uncertainty in the cost-benefit analysis rather than the disparity between reconnaissance level data and detailed baseline studies. The staff believes that reconnaissance level data gives sufficient information (in most cases) to make valid siting decisions, and that while the usefulness of baseline studies is to some extent confirmatory, the primary purpose is to make valid mitigation decisions regarding site-specific design.

Legal Considerations

In the licensing of Site A, Site B might be deemed not obviously superior. However, if Site A is banked and Site B is then submitted for review and

for use prior to Site A, it could be challenged that Site A should be used unless Site A is reevaluated and deemed not to be obviously superior to Site B.

Also, if the existence of detailed information for Site B as well as for Site A makes the criterion of "obviously superior" inoperative, what would or should be the new comparison criterion and how should it be invoked?

Public Interest Considerations

It is certainly in the public interest not to require unnecessary rereview of pre-approved sites, since it is unlikely that much additional environmental protection would be provided. Also, it is likely that eventually all banked sites would be used for power production or for some other use, even if there were some small near-term environmental improvement due to sequencing.

Courses of Action

Option 1 - The NRC could choose to not address this problem and leave it to the staff and Boards to handle on a case-by-case basis.

Pros

- This could be a controversial area which has no case precedent.

Cons

- This could eliminate the banked site as a viable option.

- Relitigation likely, with little to be gained (if anything) from the expenditure of public and private funds.

Option 2 - The NRC could place no additional requirements on applicants but seek legislation and/or develop regulations which preclude re-examination of alternative sites when a pre-approved site is used in an application absent significant new information on the suitability of the proposed site.

Pros

- This would resolve the basic problem.

- Would likely not result in degradation of the environment.

Cons

- Could be perceived as not providing adequate environmental protection

- If this is adopted, then site suitability should also be the operative criterion for reopening any alternative site question after issuance of an LWA or a CP, otherwise there would be a mismatch of standards for reopening this issue.

- May not be consistent with NEPA

Option 3 - The NRC could recommend systematic selection procedures and expanded regions of interest and allow complete utility choice when environmental equivalence has been demonstrated between potential pre-approved sites regardless of whether they were pre-approved in separate or combined applications as long as they were compared and examined through the EIS and hearing process and had been found environmentally equivalent.

Any sequencing evident between groups of pre-approved sites would probably have to be maintained.

Pros

- This would resolve much of the basic problem

- Would correctly be perceived as providing adequate environmental protection.

Cons

- Could require relitigation regarding proper sequencing for those banked sites that were not compared and found environmentally equivalent.

Staff Consensus

There is no immediate staff consensus on the detailed approach to resolution of this problem. There is staff consensus that an applicant should be allowed to choose between environmentally equivalent pre-approved sites that will satisfy his needs.

ENCLOSURE B
ALTERNATIVE DECISION FRAMEWORK FOR
THE EVALUATION OF ALTERNATIVE SITES

Background

In developing the proposed framework in the main section of this report an alternative decision framework was also considered which warrants public review and comment. This Enclosure will briefly describe the alternative framework and highlight how it differs from that proposed by the staff.

The issues in Enclosure A, "Issues of Significance Relating to Review of Alternative Sites for Nuclear Power Facilities," are formulated as issues in the implementation of the proposed framework. While many of the issues would apply equally to the alternative framework some would not and it should be emphasized that the proposed framework is an underlying premise of Enclosure A.

Considerations

In reviewing an applicant's site selection process, the staff should demonstrate that a practicable process has been used by the applicant and that this process has identified sites that are among the best that could reasonably have been found for a nuclear generating station of a given size and character. Such a decision standard ensures that candidate sites have been identified, all of which should be licenseable, which represent the reasonable range of alternatives available to the applicant for siting the generating facility. The applicant's proposed site should

come from this set of candidate sites. Since the selection of candidate sites should have produced a set of locations which may all be suitable locations for generating facilities, it would generally be difficult to select one which is "best" when compared to all the others. It would be the more usual case that a detailed comparison (based on reconnaissance level information) involving all those factors important to the siting decision would segregate the sites into groups which can be differentiated but within which the sites are functionally equivalent.[1]

Equivalence implies that inherent uncertainties in the magnitude of possible effects and in the relative importance of those effects does not allow a clear preference for one site to be established, i.e., an assumed variation of parameters within their uncertainties would be likely to change the marginal preferability of sites within the group. It may sometime occur that a single site would maintain its relative preferability with respect to other sites throughout the range of variability of parameters which are important to the siting decision. Such a site would be an obviously superior site. It would be expected that an applicant would propose such a site. In the absence of an obviously superior site, the staff should demonstrate functional equivalence; the choice within a functionally equivalent set is the prerogative of the applicant. The staff's

[1] "Functionally" is used here to define the scope of the factors which enter into the analysis. These factors include all those in the definition of "human environment" as proposed by CEQ in 40 CFR 1508.14 plus the financial cost of building the proposed facility, but exclude non-recoverable costs and potential costs of delay. This is the same set of factors used in the definition of "obviously superior" by the Commission in Seabrook.

role should be to demonstrate that the applicant's proposed site is at least functionally equivalent to, or obviously superior to, any of the candidate sites selected as among the best that could reasonably be found.

After a site has been reviewed by the staff and found to satisfy the criteria stated above, an ESR, LWA or CP granted for that site should attach to the site a special status within the regulatory process. With the understanding that the decisions have been made with the best available information and state-of-the-art analyses, the proposed site should not be challengeable on the basis of an alternate site unless that alternate site is obviously superior to the proposed site, including forward costs (i.e., costs of completing the project at both sites). This status is deserved because of the extensive staff and applicant effort involved in reaching a decision which could not have been made differently at the time with available information and analytical techniques.

This alternative framework proposes that: 1) The staff should ensure that a selection process has resulted in candidate sites which are among the best that could have reasonably been found; 2) The proposed site is functionally equivalent to, or obviously superior to, each of those candidate sites which were selected as among the best that could have reasonably been found; 3) After issuance of a CP, LWA or ESR the proposed site will not be rejected on the basis of an alternate site unless that site is obviously superior to the proposed site, including forward costs (i.e.,

financial costs of completing the project at both sites).

Differences

The difference between this framework and that proposed is that the "obviously superior" decision criterion based on a differential of forward costs would not be applied until after a regulatory decision had been made. Prior to a regulatory decision the evaluation criterion would be a selection standard defining what the staff should look for in the standing of the proposed site with respect to alternatives rather than a rejection standard defining what an alternative should look like with respect to the proposed site. The alternative framework would also maintain that the applicant's risk of rejection could not be lowered by inclusion of forward costs in the analysis until after a regulatory decision had been made.