

VALUE-IMPACT GUIDELINES

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GUIDELINES FOR CONDUCTING

VALUE-IMPACT ANALYSIS

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11/21/77

SUMMARY

> Regulatory Perspective

The policy of the Nuclear Regulatory Commission is that value-impact\* analyses be conducted for any proposed regulatory actions\*\* that might impose a significant burden on the public (where the term public is defined in its broadest sense). Such policy is not to be construed to mean that cost considerations take precedence over considerations of health, safety, environment, or national security. These factors remain paramount. However, where there are alternative means of realizing equivalent benefits in regulatory matters, cost should be a prime consideration.

It is recognized that only rarely will all considerations in a regulatory matter be amenable to quantification. Regulatory decisions will in the final analysis remain a matter of judgment. However, value-impact analyses, by focusing on the narrower issue of public benefit and burden, can help to make more informed judgment possible. Elimination of unnecessary costs associated with a regulatory action provides resources to achieve desired levels of other societal goals. It is not intended that the value-impact analyses replace the normal pro/con discussions usually contained in staff papers. Such analyses should be complementary to the

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\* In order to provide uniformity and to avoid misunderstanding these analyses should be referred to as "value-impact" rather than "impact-value" or "value/impact."

\*\* See the original guidance memo from the Commission, Attachment A.

more inclusive pro/con discussion which may address more subjective items such as procedural and organizational alternatives, or public perception of the issues.

Value-impact analysis is appropriate for unique or generic licensing actions and other non-routine, non-recurring regulatory actions requiring Commission decision.\* Value-impact analysis is also appropriate for proposals which are reviewed by the Regulatory Requirements Committee and during the preparation of Branch Technical Positions and new or revised regulatory guides. Value-impact analyses will not routinely be required for specific licensing actions, such as the issuance of facility, material and export-import licenses, license amendments, and enforcement actions.

Some NRC evaluations such as generic environmental impact statements already contain elements in common with value-impact analyses. In instances where value-impact analyses have been integrated with such non-routine appraisals, a separate section (called a value-impact statement) which briefly summarizes the elements of the value-impact analyses should be included when the document is forwarded to the Commissions.

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\* See Appendix I for more extensive discussion including examples of previous staff work for which value-impact analysis would have been appropriate.

\*\* These guidelines would not require additional documentation to what staff now provide where the latter contain the essential elements of value-impact evaluations listed on pp. iv & v. Thus no new format would be necessary for the analyses (unless required by Office - specific guidelines). However, when feasible, value-impact statements should follow the format used in the illustrative value-impact statement presented at the end of this summary section.

All Commission papers classified as either "Commission Action Items", "Policy Session Items", or "Consent Calendar Items" should be accompanied by a value-impact statement or an explanation of the reasons for not including a statement. Such reasons might be that the action is non-regulatory (e.g., paper recommends that the Chairman sign a letter to a Congressman) or that the regulatory action recommended is "routine" or recurring in nature (e.g., approval of an export license for low-enriched uranium).

In instance where it has been concluded that the public would not be significantly affected, a declaration of negative findings is appropriate, i.e., "Analysis indicates inconsequential impact associated with recommendation." A brief statement of the elements evaluated should accompany a negative declaration. In some instances the following statement may be appropriate, "Alternatives to the staff recommendation have been precluded (or limited) by statute (or previous Commission action)."

As a general rule, the depth or extensiveness of a value-impact analysis should depend on the magnitude of the expected costs and benefits associated with the proposed action, except where anticipated public interest alone would dictate a more complete statement. In any event, though there may be extensive background or supporting analysis, the value-impact statement itself should be kept as brief as possible.

### Element of Value-Impact Analysis

Value and impact analysis as commonly interpreted at the Nuclear Regulatory Commission is essentially a technique equivalent to benefit and cost analysis, or cost and effectiveness analysis.\* The term value-impact was introduced at NRC to dispel certain connotations associated with other terms. Benefit-cost analysis, in particular, is sometimes misperceived as a process of reducing all factors to a common dollar form.\*\*

In these guidelines impacts are negative consequences (e.g., environmental damage or increased economic costs) and values are positive or beneficial (e.g., reductions in radiation doses to the public.) Ideally, elements of value and impact evaluations would include:

- . A statement of the objectives of the recommended action.
- . A description of the setting and background of the problem including analytical assumptions, and specification of the relationships between alternatives and the objective.\*\*\*
- . Description, identification, and definition of alternatives (which should include the status quo or current system).

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\* See Appendix II which discusses benefit-cost and cost-effectiveness analyses.

\*\* When, in fact, factors expressed in physical units can be quite acceptable in some benefit-cost analyses.

\*\*\* This element is sometimes called the scenario or the model.

- Estimates of the incremental (or marginal, or differential) benefits (or levels of effectiveness), and associated costs, (including side effects) of the various alternatives when compared with the base case of status quo.
- Identification of criteria for assessing or ranking of alternatives.

The heart of value-impact analysis is the evaluation of alternatives and these should be described and defined in the statement. Ideally, alternatives would be defined as different actions with the identical or similar consequences, benefits or costs. A possible exception is the base or reference case (e.g., the status quo, the option of taking no action, or continuing with current practices). The implications of taking no action should be evaluated even in those instances where the option would not completely satisfy the same objective as would the alternative recommended by NRC staff.

Both basic elements and special topics are addressed at length in the body of the guidelines.\* Although pro-forma, sketchy treatment of alternatives should be avoided; it is unlikely that many value-impact analyses conducted at NRC will necessitate such lengthy discussion of each of the elements. Nevertheless, the material may prove to be useful on a selective basis to NRC analysts. Appendix III contains examples of the possible scope and content of value-impact analyses and evaluations.

\* These guidelines are intended to provide general instructions. Each NRC office should develop its own specific guidelines (e.g., emphasizing format) which are adapted to the particular issues analyzed by the office.

An Illustrative Value-Impact Statement (Inerting of Containment)

A. Objective

It is predicted that inerting of containments of selected reactors will reduce the probability of a hydrogen explosion immediately following a Loss-of-Coolant-Accident (LOCA)

B. Background and Setting

In some small containments (for a few boiling water reactors) the combustible gas control system would not be able to accommodate the large concentration of hydrogen associated with the metal-water reaction immediately following a LOCA. Five reactors would be required to inert if staff recommendations are approved.

Major assumptions are:

1. Agency policy is to continue with the current technical approach, a passive containment concept.
2. Reduced containment inspection will not result in failure to diagnose a reduction in containment integrity.

C. Alternatives

1. Retain Status Quo
2. Inerting
3. Purging
4. Recombiners



D. Value-Impact Evaluation

Value and impact estimates are provided in the accompanying table. For example, the incremental value of alternatives 2 and 3 is that each would prevent a radioactive dose release of 595 rem in the event of a post-LOCA hydrogen explosion.

Note that the costs shown are per plant. Total plant costs estimated to be: Alternative 2, \$62,500 to \$3,260,000; alternative 3, \$7,000,000 equipment cost plus \$620,000 annual operating cost. Incremental costs associated with increased demand for and transportation cost of nitrogen, used in inerting, are estimated to be minimal.

E. Criteria

Select lowest cost alternative which reduces probability of a hydrogen explosion [See discussion in text of guidelines - pp. 14 and 15 - regarding additional analysis which might be accomplished on inerting issue.]

TABLE 1 Control of Hydrogen from M-W Reaction Immediately (2 min.) After LOCA  
 (For the estimated 5 plants that will still be required to inert)

<u>Alternative</u>	<u>Potential Radiation Dose</u>	<u>Cost of Implementing</u>	<u>Developmental Work</u>	<u>Comments</u>
Inerting	0	\$12,500 to \$507,000	None	Appeal Board Decision Against Inerting Vermont Yankee
Purging	0	\$1,400,000 capital cost \$120,000 annual operating cost. (Does not account for loss in production time associated with maintenance of these systems)	Very little	Will have to purge immediately after LOCA with maximum radiation in containment! Must therefore have filtering system capable of 150,000 cfm. Represents a radical departure from the passive containment concept that is presently required by NRC.
Recombiners	595 rem*	\$200,000 per 100 cfm unit	None for present units. However, a major effort would be required to develop a system to handle 150,000 cfm.	Recombiner must operate immediately after accident and must handle 150,000 cfm. This would require about 1,500 currently available units or undertaking a major developmental program that may or may not succeed in producing 150,000 cfm units in a reasonable time period. The calculated dose assumes loss of containment integrity because of inability of currently available units to handle large amounts of hydrogen rapidly. This is the same release as if the plant had not been inerted.

\* Assumes no fuel failure, however, transient occurred before LOCA and resulting iodine spike is at Technical Specification limit of 4  $\mu\text{Ci/gm}$  I-131 equivalent.

## GUIDELINES FOR CONDUCTING VALUE-IMPACT ANALYSIS

The objectives of these guidelines are to provide NRC staff with criteria for application and techniques for preparing value-impact analysis.\* These guidelines are intended to provide general instructions. Each NRC office should develop its own specific guidelines (e.g., emphasizing format) which are adapted to the particular issues analyzed by that office.

### What is Value-Impact Analysis?\*\*\*

Value-impact analysis is a method enabling comparison of consequences associated with alternatives identified to satisfy some objective or to meet some goal. Examples of objectives associated with NRC policy actions are:

1. Increase the level of safety (or decrease adverse health effects and property damage) associated with the operations of a nuclear reactor by:
  - a. Reducing routine emissions of radioactive materials, or
  - b. Reducing the probability of accidental release of such materials, or
  - c. Reducing the magnitude of undesirable effects associated with accidental release of such materials (e.g., through regulations related to siting decisions).

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\* Criteria are discussed and applied to a sample of Commission papers in Appendix I.

\*\*\* In order to promote uniformity and to avoid misunderstanding, an analysis should be referred to as "value-impact" rather than "impact-value" or "value/impact."

2. Increase the effectiveness of safeguards associated with the operations of a nuclear reactor by:
  - a. Reducing the probability that a saboteur could reach a given target or
  - b. Reducing the probability that a saboteur could effect the release of radioactive material once the target was reached.
3. Increasing the level of safety associated with use of special nuclear material by reducing the probability of accidental exposure.

Such an analysis is not complete unless it addresses both the impact and the value of the proposed action. Analysis of the impact of a given policy action (e.g., a policy action might be the imposition of a new regulation to change a class of licensees from specific to general) designed to meet some objective seeks to identify the costs of resources (such as labor, equipment, land) which would be required to effect the action. The concept of impact includes any undesirable "side-effects" associated with recommendations and may or may not be quantifiable.

Evaluation of the value of a given policy action seeks to measure the relative merit of the action. For example, we may know that if licensees complied with a particular new regulation the routine release of a certain radioactive material would be reduced. The amount by which such emissions would be reduced when compared with emissions in the absence of the

regulation could be one measure of the value of requiring compliance with the standard.\*

Evaluation of the values of alternatives for meeting an objective attempts to estimate the relative or absolute differences in the effectiveness of the alternatives. Value-impact can thus be a formal statement of reasons why one policy alternative, rather than another, is recommended. It can be an adjunct to the "pro and con" approach and differs from the latter by attempting, when feasible and practical, to measure an alternative's ability to satisfy a stated objective. Pro and con discussions and other evaluations normally prepared by NRC staff are generally more inclusive and may contain subjective elements such as administrative considerations or the public's perception of an issue.

What is the Value of a Value-Impact Analysis?

Practically all NRC policy actions lead to a commitment of resources. Once committed, these resources are unavailable to society to produce other desirable commodities such as food, housing, or medicine. Thus it should be a matter of concern, both to the government and the public, if policy actions, whose high costs did not appear to be justified due to associated low values or benefits, were being undertaken.

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\* If uncertainty makes single-number estimates tenuous the estimation of the value of a range of postulated emission levels may be appropriate.

A value-impact analysis may be only one of the criteria by which a policy action is evaluated. For example, there may be instances in which the decisionmaker may place a very high but unquantifiable value on safety relative to impact.

Another example is a situation in which the benefits of the action accrue to one party while the costs accrue to another. Even if the value of the action exceeded its impact, or cost, support of the project would involve the judgment that it is not necessary that those who gain must also pay.\* The point is that, ultimately, all policy decisions must involve judgment.

A primary purpose of the analysis is to document explicitly any value judgments and assumptions made thereby allowing the Commission, the public, and licensees to better understand and evaluate the basis for the recommendation or decision. Preparation of the analysis may help the NRC staff to identify more readily the issue and subissues associated with a specific policy action. Moreover, the evaluation, properly prepared, should reduce the number of occasions spent in discussions with the Commissioners regarding such things as seemingly attractive alternatives which haven't been included in the policy paper (see the section on alternatives, below).

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\* For NRC decisions the issue of who gains and who pays would obviously be subordinated to the primary concern about the effect of the action on public safety.

In What Circumstances Should a Value-Impact Statement be Prepared?\*

Value-impact analysis should be prepared for any proposed "non-routine," non-recurring regulatory actions which might impose a burden on the public (where the term public is defined in its broadest sense). \*\*

For example, the Office of Standards Development requires that a preliminary value-impact analyses be prepared prior to initiating new, or revising existing regulations. \*\*\*

Value-impact analysis is appropriate for unique or generic licensing actions and other non-routine, non-recurring regulatory actions requiring Commission decision. Value-impact analysis is also appropriate for proposals which are reviewed by the Regulatory Requirements Committee and during the preparations of Branch Technical Positions and new or revised regulations and regulatory guides. Value-impact analyses will not routinely be required for specific licensing actions, such as the issuance of facility, material and export-import licenses, license amendments, and enforcement actions.

The value-impact analysis or evaluation should be summarized in a value-impact statement which should accompany, or be contained in a separate section of, decision papers. \*\*\*\*

\* Appendix I contains illustrations of the types of Commission papers which should be accompanied by value-impact statements.

\*\* - In instances where there is no regulatory impact, a value-impact statement is not required, although the analytical approach may prove useful in the evaluation of alternatives.

\*\*\* Given the current interest in the burden of reporting requirements on the public every new reporting requirement should be analyzed thoroughly.

\*\*\*\* These guidelines would not require additional documentation to what staff now provide where the latter contain the essential elements of value-impact evaluations listed on pp iv & v. Thus no new format would be necessary for the analyses (unless required by Office - specific guidelines). However, when feasible, value-impact statements should follow the format used in the example on pp vii and viii of these guidelines.

Some actions may not be amenable to such analysis. Others may have such minimal impact that they do not warrant in-depth analysis: an example might be a revision in regulatory codes to remove ambiguity in the current phrasing. In these instances, the statement will merely be a declaration of negative findings, i.e., "NRC staff analysis indicated inconsequential value and impact associated with the recommendations."\* In other instances the following statement may be appropriate: "Alternatives to the staff recommendation were precluded (or restricted) by statute (or previous Commission action)."

Some NRC evaluations such as generic environmental impact statements already contain elements in common with value-impact analyses. In these instances a value-impact statement should accompany the environmental statement when it is forwarded to the Commission.

As a general rule the depth or extensiveness of the value-impact analysis which supports the value-impact statement should depend on the anticipated magnitude of the costs and benefits associated with the proposed action. However, there may be instances in which anticipated public interest alone would dictate a more complete analysis. Although there may be extensive background or supporting analysis and calculations, the value-impact statement itself can usually be very brief.

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\* However, a series of relatively minor regulatory actions may have a large cumulative impact on the public. Thus, the analyst should be careful to note instances where the proposed regulatory action is one of several related actions.



The purpose of the Office of Standards Development's requiring a preliminary value-impact analysis is to avoid the development of standards which are not cost-effective and to help identify credible alternatives. Such an analysis, although generally based on incomplete information, is important because it is accomplished before the analyst might have developed a "vested interest" in a specific option or alternative. Preparation of a preliminary analysis (e.g., during the information gathering phase of a project) should be an integral component of policy analyses by all program offices.

It may be worthwhile to prepare preliminary value-impact statements for selected standards initiated for, or currently under development by, national standards organizations (such as ANSI) if, in the opinion of NRC staff, such would probably be adopted or endorsed by NRC. Early analysis of voluntary standards being developed by industry will minimize the possibility of wasted efforts by the significant number of individuals who participate in such activities.

#### Elements of a Value-Impact Analysis

Ideally, each value-impact analysis would contain elements as follows:

Objective: A statement what the recommended policy action is expected to accomplish.

Setting and Background: A description of the problem and analytical approach, including analytical assumptions and a specification of the logical relationship between alternatives and the objective.\*

Alternatives: Identification of different approaches with identical, or similar outcomes (or identical, or similar costs if cost is being held constant). Alternatives should include the "base case" or status quo (e.g., a description of the current system).

Value and Cost Estimates: Defined earlier.

Specification of Criteria: Standards by which the alternatives will be judged and upon which the recommendations will be based.

A more detailed description of these elements is as follows:

1. Objective:

Statement of this element will normally progress from the more general (e.g., increase public safety) to the more specific (e.g., constrain routine emissions of radioactive materials to levels of doses consistent with "X" man-rem annually). If feasible, the objective should be stated in quantitative terms so that the proposed action can be compared with the status quo as well as with other alternatives.

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\* This element is sometimes called the scenerio or the model.

Often, the development of the statement of objective may be the most time consuming and thought provoking aspect of preparing a value-impact evaluation. In an optimal situation, estimation of the value of the proposed policy action would require minor effort beyond the statement of the objective. For example, it has been estimated that, if certain reactors had a loss of coolant accident (LOCA), there is a possibility of a hydrogen explosion which could release 595 rem to the atmosphere. NRC staff analysis has concluded that inerting of the containment atmosphere would reduce to zero the probability of such an explosion. The objective of requiring inerting of these reactors ( a policy advocated by NRC staff) is to avoid such an explosion. Therefore, the value of inerting, when compared with the status quo or base case,\* is the product of 595 rem (per reactor explosion) when multiplied by the expected or predicted number of explosions.\*\*

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\* I.e., the situation which would continue in the absence of inerting.

\*\* Assuming that the probability of such an explosion were equal to 1.0 and that there were no undesirable impacts on the reactor system associated with inerting. Any such undesirable impacts should be considered as costs and quantified, if possible (or discussed in qualitative terms). The point is that the ultimate choice may involve tradeoffs of desirable and undesirable consequences.

Note that it may be important to consider not only current consequences, but consequences in future years as well. For example, the risk of a LOCA in 1990 might be greater than in 1977 if there were a greater number of these particular reactors operating at the later date.

In some instances it may be possible to demonstrate that a problem exists but impossible to determine a quantitative measure of the value of alleviating that problem. In those instances the analysis will be restricted to a search for the least costly alternative which would accomplish the objective.

## 2. Identify Setting and Analytical Approach

This element provides the background, describes the problem and puts it in context, presents assumptions, and discusses related (existing or pending) rules, regulations, or other policy decisions.

The analytical approach (or "model") need not be highly formal or mathematical to be useful. However, it is imperative that the analyst explicitly state the assumptions and perceived or hypothesized interactions between factors important for analyzing a given issue. This information is a necessary prerequisite to the definition and evaluation of relevant alternatives.

This element also describes the logical relationships between the alternatives and the objective, and spells out the implications associated with the alternatives. For example, what time-frame should be used to evaluate the alternatives? If all the alternatives

examined have high investment costs but low recurring costs then it may be appropriate to present only the initial year's cost. Alternatives with low investment but relatively high recurring costs are more appropriately summarized by, say, the costs of 5 years of operations. However, all alternatives discussed in a specific issue paper should be compared using the same time-frame. Examples of other questions that the analyst might address are:

- . How many licensees will be affected?
- . Is it expected that the recommendations will affect prices of materials and equipment or wages of workers in addition to those associated with the licensee?
- . What assumptions must one make in order to conclude that the recommended approach will be the most effective or the least costly?
- . What is the probability that the undesirable consequences would be realized if the staff recommendation weren't adopted?
- . In instances which involve using state-of-the-art technology what assumptions are being made about the timing of technological change?
- . What are the major uncertainties in the analysis?
- . What gaps in our knowledge would force any conclusions to be strongly qualified?

By carefully detailing the assumptions, expected relationships, and rejected alternatives, the analyst provides the information necessary

for someone else to reproduce or verify the conclusions of the analysis. This process should also expose potential staff preconceptions about the solution to the problem. For example, when making recommendations on standards related to exposure of individuals to high radiation sources it might be assumed that humans will ultimately err and thus safety systems should be dependent upon equipment which doesn't require any human interaction. This assumption would "drive" the relative ranking of alternatives and therefore should be explicitly stated in an analysis of the issue.\*

### 3. Specification of Alternatives:

The heart of policy analysis is the evaluation of alternatives. What technical measures or administrative actions would accomplish the objective? \*\* Examples presented thus far assumed that there were only two options, the recommended staff position and the status quo or base case.

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\* Examples of well specified settings can be found in Analysis of Radiography Overexposures, Enclosure A to SECY-76-146 (same title) March 15, 1976, and in NUREG 75/086, Draft Environmental Statement for Spark-Gap Irradiators that contain COBALT-60 (short title).

\*\* Assuming that it appears desirable to regulate a particular activity the mechanism must be selected. For example, would it be more appropriate to issue a regulatory guide, or a regulation, or approve an ANSI standard (assuming that one has been developed)?

Ideally, alternatives would be defined as different actions with identical or similar consequences, benefits or costs. A possible exception is the base or reference case (e.g., the status quo; the option of taking no action, or continuing with current practices). The implications of taking no action should be evaluated even in those instances where the option would not completely satisfy the same objective as would the alternative recommended by NRC staff.

Alternatives can be as diverse as two completely different actions or acting at one time rather than another. As an example of the latter, suppose that evidence of poor procedures by a certain class of licensees was quite prevalent in inspection reports. One alternative might be to issue a regulatory guide outlining acceptable procedures. However, if licensees, once cited, must submit evidence to inspectors that acceptable procedures will be introduced, then we can expect that ultimately all licensees will adopt good practice regardless of whether a regulatory guide were issued (assuming that all members of this class of licensees would ultimately be inspected). This issue would concern the value (e.g., undesirable consequences avoided) and impact of assuring that good practices would be adopted at an earlier date (and possibly the advantages of having available written guidance for prospective new licensees).

In many instances alternatives will include a particular regulation and another one which is more "stringent." Consider an exterior intrusion alarm system whose function is to help safeguard a reactor. Alternatives might be defined as alarm systems of varying performance capabilities such as differing mean-time to-failure or differing levels of false alarms per time period. The issue here would be the value and cost of the increment in security (or additional effectiveness of the reactor's total safeguard system) associated with each alternative.

Whether to impose a particular regulation only on reactors under construction or on existing plants (thus requiring retrofit) will often be two alternatives worth evaluating.

Often, there are alternatives that would result in values or impacts which lie somewhere between those associated with the recommendations of the staff and the base case (as an illustration suppose that there were some technical means of reducing releases to 250 rem in the event of hydrogen explosion). Thus it may be appropriate to include alternatives which are superior in estimated value (greater benefit) to the status quo or base case but are not quite as effective as the recommended staff position in terms of, say, increasing the public safety. Indeed, if compared with the most effective action



there exists an alternative which would provide 60-75% of the value for 10-15% of the cost impact then the Commission should be made aware of this possibility.

It will usually be worthwhile to mention, and in some instances provide detailed analysis of alternatives which were rejected due to excessive costs, lack of effectiveness, or failure to meet other criteria. This will save "rediscovering of the wheel" by parties outside of the initiating office (e.g., the Commission and affected licensees). Alternatives which appear to be attractive in terms of costs or effectiveness but which would imply a break with previous regulatory philosophy should also be included. For example, the revised issue paper on "inerted containment" included the alternative of purging even though this approach represented a departure from the passive containment concept that is preferred by NRC. By including this latter option the staff provided the Commission the opportunity to reaffirm the desirability of the concept.

Value impact statements should not confront Commissioners with a "Hobson's choice". Thomas Hobson was a 17th Century liveryman who offered his customers the choice of taking the horse nearest the door, or no horse at all. Staff work should always recognize the difference between recommending policy alternatives versus giving "the" answer. Although consideration of additional alternatives

may lead to greater demands on the analyst's time, it is often the case that preliminary analysis will indicate the dominance of one or two alternatives (i.e., one or two that are clearly superior in terms of low costs or high effectiveness). The "inferior" alternatives would require only brief reference in the value-impact statement.

#### 4. Analysis of Value

In order to adequately evaluate the alternatives it is necessary to identify an index (or indices) of effectiveness or value,\* such as:

- a. Quantitative (absolute); e.g., the best estimate of the number of man-rems of exposure (or health effect, or estimated monetary equivalent) to a radioactive substance.\*\*
- b. Quantitative (relative); e.g., the base case might be labeled 100% release of radioactive materials and the alternatives might be identified in percentage terms such as, "alternative one would result in a release of 80%, relative to the base case, whereas the recommendation would result in a release of 10%."

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\* Note that in some cases the index may be an ideal theoretical construct and may not be directly measurable or observable.

\*\* Where uncertainty dictates, a range of estimates, rather than a single number, can be compared with costs.

- c. Qualitative; e.g., "In the judgment of experts alternative one would provide a higher level of safety than would alternative two and the base case alternative."

Using one of these measures the analyst can provide the decision-maker (e.g., the Commission) with an estimate of what would happen if a certain decision rather than another is made, or what would happen in the absence of any action (e.g., licensees would continue to operate under conditions of the status quo). Estimates for each alternative should be in terms of the additional (or incremental or marginal) value when compared with the status quo or base case.

Note that it may not be necessary to estimate the ultimate consequence of a policy alternative. An estimate of the ultimate value of a specific safeguards countermeasure would be based on assumptions about the dollar value and psychic cost of preventing premature deaths, illnesses, and decreased property values. However, a countermeasure's value might also be estimated by a "figure of merit." An example might be the amount by which the countermeasure reduced the probability that a saboteur or nuclear materials thief might be successful. Or it may be possible to calculate "health effects" (such as numbers and types of anticipated illnesses). Comparison of such figures of merit with costs associated with particular countermeasures will often illuminate dominant alternatives.\*

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\* In the inerting example discussed earlier the figure of merit was the amount of radioactivity which would not be released.

If expected value or cost is high and data are available, more detailed analysis should be attempted.\* For example, a more detailed analysis of the value (impact or costs are discussed in a subsequent section) of inerting would apply "Rasmussen's techniques"<sup>\*\*</sup> and go through the following steps:

- a. Utilize a dispersion model and actual data on population density around a model or reference plant site to estimate the man-rem dosage associated with the accident.
- b. Estimate the probability of an explosion in terms of reactor years and multiply this probability times the man-rem numbers developed in step "a" to provide a "best estimate" or "expected value."
- c. Multiply the amount in step "b" by \$1,000 per man-rem (or other agreed upon value).

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\* Where value or cost appear to be substantial, more effort should be devoted to collecting appropriate data when the analysis is initiated.

\*\* See the Reactor Safety Study, WASH-1400.

- d. Estimate the dollar loss of plant and equipment, the value of replacement electricity which would have to be purchased after the explosion, the decrease in property values associated with an accident, and the costs of decontaminating property (and any revenue losses during the contamination period), and multiply these estimates by the probability of an explosion. These are expected costs which could be avoided through inerting and thus can be included as part of the value of inerting when compared with the status quo.
- e. Add the dollar amounts in step "c" to those in step "d" to obtain the expected value or benefit of requiring that reactors be inerted.
- f. Repeat steps "a" to "e" for any other alternatives which would either reduce the probability of an explosion or would reduce the magnitude of the release if there were an explosion.

5. Cost or Impact Estimate

This element should include all undesirable consequences associated with various alternatives. This consideration is particularly important when evaluating changes to engineering systems; if one subsystem or component of a system is changed other components may become less effective or less reliable.

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Note that even when costs are estimated in money terms these costs are  
not necessarily equivalent to dollar outlays or total expenditure.  
For example, the market prices of some resources may not reflect the  
true costs of producing them.\* In the early days the Government  
omitted depreciation on plant from its calculations of the costs  
of producing enriched uranium and correspondingly set the price  
of below actual cost of production and value to society.

In other instances resources may not even be traded (e.g., they  
may be produced and allocated by the Government) and therefore  
there is no market price to use as a benchmark. For example,  
around 1950 Air Force planners who were evaluating strategic  
systems treated fissionable material used for weapons systems -  
(U235 and Pu239) as a free commodity, probably because it  
was produced by another agency, the Atomic Energy Commission.

Often the costs of Government personnel are underestimated.  
Relevant costs would include overhead, and fringe benefits such  
as Government's share in retirement, health and life insurance, in  
addition to salary.

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\* In some instances it may not be possible to measure or quantify  
all costs or impacts. See the discussion of intangibles in the  
Special Topics section of this paper.

Costs that have already been incurred (sometimes referred to as sunk costs) are not relevant to future decisions.\* Only costs to be incurred in the future need be considered - - resources already utilized cannot be retrieved. Furthermore, the relevant costs are the additional (or incremental or marginal) costs associated with a particular alternative after subtracting any costs incurred by electing to stay with the status quo. Some costs may be realized regardless of the alternative selected. Thus, it would be misleading to compare total costs of alternatives.\*\*

Suppose that an NRC regulation required that an existing radiation-waste system (call it B) on a particular type of reactor be replaced by another (call it A). Suppose that the installation of system A necessitated an investment cost of \$3 million (assume also that the cost would be the same regardless of whether the reactor was under construction or being retrofitted), required no maintenance, and would last the life of the reactor. Suppose that the cost of system B was \$2 million, and required no maintenance. Several different situations can be envisioned, for example:

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- \* For example, when deciding whether to replace an old piece of equipment the relevant costs to be compared are the expected maintenance cost of the old and the purchase and maintenance costs of the new. Money already spent to purchase and maintain the old equipment is irrelevant.
  - \*\* A more detailed discussion is contained in Grant, et al., Principles of Engineering Economy (1976), Chapter 15.

- a. Suppose that an existing plant must be retrofitted. In this case the marginal or incremental cost is \$3 million (the cost of system B is a sunk cost and therefore should not be added to the cost of A).
- b. Suppose the plant has not yet been constructed. The marginal cost would be the difference between installing system A or system B, i.e., \$1 million. (This example illustrates that marginal cost is relevant for analytical comparison of alternatives but not necessarily for budgeting. I.e., a utility would still be faced with out-of-pocket costs of \$3M.)
- c. Suppose that an existing plant were 1 year old (could economically operate for another 29 years) and that the economic life of system B were 15 years (rather than 30 as has been implicitly assumed in examples 1 and 2 above) and that of A. were 30 years. In this case the marginal cost of system A is \$1 million (in nominal or undiscounted dollars - see the discussion of discounting below) since system B would have to be replaced at year 15 regardless of whether a new regulation were issued.
- d. In the case of a plant yet to be constructed and a system B with an expected 15 year lifetime, installation of system A would actually save \$1M over the lifetime of the plant (again in undiscounted dollars).



Although the NRC may incur some costs in implementation, normally it is the licensee who will realize the bulk of the costs associated with a particular regulation. However, there may be other parties whose costs of doing business would increase. For example, an NRC regulation might conceivably increase the demand for a material in short supply and thereby lead to an increase in its price. All firms which used this material would realize an increase in their production costs. The incremental increase in production cost should be estimated for inclusion in the value-impact statement.\*

Why should the NRC be concerned with increase in private sector costs outside the industry being regulated? The answer is that an increase in the price of a commodity "A" (which resulted, say, from an increase in the costs of production) will leave the consumer with less income to spend on all commodities other than commodity "A". Hence price or wage increases are costs associated with policy options. If an NRC action results in an increase in the costs of production but no increase in goods and services, society has borne real costs.\*\*

In the case of facilities, increases in costs can be categorized as one-time, non-recurring (such as installation, purchase, or investment costs), and recurring annual costs such as those for operations, maintenance, and annual interest payments on money borrowed to finance the investment). \*\*\*

\* Note that price or wages increases in other industries may be purely pecuniary or money increases rather than real resource costs. See the following footnote.

\*\* See C. Hitch and R.N. McKean, The Economics of Defense in the Nuclear Age (Chapter 3) for an elaboration of this point. The analyst should be careful to distinguish between real resource costs and apparent costs which are actually changes in the distribution of wealth. An example of the latter might be a new requirement that licensees "self inspect" in some areas which are currently the responsibilities of NRC inspectors.

\*\*\* For the special case of radiation-waste systems for LWRs, draft Regulatory Guide 1.110 provides detailed instructions for estimating costs.

Losses in productivity or production time (or their monetary equivalent - e.g., the cost of hiring more resources than formerly needed to produce a given output or offer a given level of service) should be included as costs. If a plant has to shut down for retrofit then its owners will either lose revenue or have to purchase replacement power. If regulations lead to reduced capacity (below rated capacity) the lost revenue (or the increase in capital cost if a utility decides to build the necessary replacement capacity) should be calculated.

Reduced productivity might result from the addition of administration duties such as inspections required to support reports to NRC. This latter cost can be approximated by estimating the number of manhours necessitated by the inspections and report writing (and multiplying this estimate by an average wage). New reporting requirements although seemingly innocuous may be seen to have a substantial impact on costs when it is recognized that NRC is but one among hundreds of government agencies which impose such requirements.

In some instances it may be appropriate to extrapolate impacts into the future. For example, even relatively small costs to a single licensee might be of more significance if the number of new licensees were to increase substantially. Therefore it may be appropriate to analyze benefits and costs for five to six years in the future as well as for the near term.

In isolated instances a recommended policy action might lead to costs to society which don't accrue to any particular or identifiable individual or firm. An example might be the radioactive emissions associated with the plutonium pacemaker. The host of such a pacemaker will come in contact with strangers as well as friends, relatives

colleagues, etc. The associated "costs," i.e., increased exposure to radioactive material, should be estimated and included in \_\_\_\_\_ the value-impact statement. Another example is the potential increase in costs associated with accidents incurred while transporting nitrogen to the inerted reactors. Although such impacts may be insignificant, including reference to such costs in staff analysis may prevent charges of incompleteness.

The value-impact statement should identify the source of the estimate of cost data. The analyst should try to validate or crosscheck cost estimates provided by licensees, equipment manufacturers, or special interest groups. If a point estimate (a single number) would connote more confidence than is warranted then the analyst should present a range for a particular cost estimate. In some instances it may not be possible to state the "costs" in monetary terms. Still, an attempt should be made to estimate such impacts in quantitative terms (this practice is followed by NRC in preparing environmental statements which compare nuclear generating stations and coal-fired plants)

The following checklist of questions may be a useful reference when preparing to do the cost or impact portion of a value-impact analysis:

- a. What equipment or materials must be purchased by the licensee?  
What is the expected economic lifetime of such equipment? Will it require maintenance or entail new operating costs?

- b. Will the licensee have to hire more employees?
- c. Will costs be increased in other product, resource, or labor markets?
- d. Will reporting requirements be increased?
- e. Are there costs to society other than those listed above in Questions a. through d. (for example, even "desirable" policy actions may have undesirable side effects)?
- f. What costs will NRC realize (both in developing a regulation and administering it)?
- g. What costs will be incurred by licensees, NRC, and other interested parties in preparation for and attendance at a hearing on a regulation or in preparing comments on a proposed regulatory guide?
- h. Are any licensees expected to leave the industry or "close the shop" if the policy is implemented?
- i. Will the policy require consumption of any materials or metals in critically short supply as identified by either the National Security Council, the Economic Policy Board, or the Council on International Economic Policy (currently - 1977 - chromium, platinum, and bauxite)?

## 6. Specification of Criteria

Evaluation criteria are often stated in terms of effectiveness indices or performance characteristics (examples in the reactor safeguards area might be numbers of false alarms from an intrusion alarm, or time to respond to the intrusion), or costs, and are subjectively determined. Explicit identification of criteria are necessary for consistency in the evaluation of alternatives and can help potential independent reviewers to reproduce or confirm the first analyst's results.

Criteria other than those specified for a value-impact analysis will be important for some policy issues. A possible example is that there might be substantial disagreement about the expected effectiveness or costs associated with specific alternatives but that NRC staff believe that the absence of an interim standard implies a clear and present danger to public safety or safeguards. Another example might be that staff feel that the absence of a standard would substantially reduce NRC credibility with the public.

## Special Topics

### 1. Sensitivity Analysis

If the conclusions of an analysis appear to be highly dependent upon particular variables (which cannot be predicted with certainty) or on specific assumptions then the effects of using a range of estimates for the variables, or changing the assumptions, should be investigated. For example, suppose that two expert's estimates of the total cost of a specific set of safeguards countermeasures differ by 50%.

Analyses should be conducted using both estimates. Such            changes in "scenario" should be made carefully since it may not be possible to separate out cause and effect relationships if several variables are changed simultaneously. An example of a critical variable might be the expected portion of the market captured by a product (for example, a plutonium powered pacemaker or a spark-gap irradiator containing cobalt - 60).

## 2. Discounting

Ideally, benefits or costs accruing at different points in time should be discounted. A dollar of benefits received one year from            now is worth less than a dollar received today. Likewise, a dollar of cost incurred one year from now is not as burdensome as a dollar of cost incurred today. Resources (defined in the broad sense, i.e., equipment, material, capital, and manpower) have a time value because they could earn different returns in alternative uses. For example, we are willing to pay interest to borrow money in order, say, to consume resources now rather than at some future date.

The process of making comparable resources which would become available or be expended or utilized, at different points in time is called discounting. It involves multiplying each year's calculated cost and benefit (if they are stated in monetary terms) by an appropriate discount factor (essentially an interest rate, see E.I. Grant, et al. p. 450 ff -- The Office of Management and Budget has directed in OMB Circular A-94 that benefits and costs be evaluated at a 10% discount rate as well as at one higher and one lower rate).

Discounting can change substantially the preference ranking of proposed policy actions. For example, the Generic Environmental Statement for the Plutonium Pacemaker states that costs accrued after replacement implant of a medium-lived (7-10 years) chemically powered pacemaker, \$8,620, exceed the cost of the initial implantation of a longer-lived plutonium powered pacemaker, \$8,490. However, this comparison is in nominal dollars. If it were assumed that a discount rate of 6% were appropriate then the chemically-powered pacemaker is almost \$1,500 cheaper.

### 3. Intangibles

There are factors associated with nuclear safety, safeguards and protection of the environment which cannot be quantified. If these factors would increase the values (effectiveness, benefit) or impacts (cost) associated with particular alternatives then the factors should be addressed in the value-impact analysis. An example of such a factor might be the differing level of worker morale as working conditions become more or less safe.

### 4. Inflation

It is generally preferable to present conclusions in terms of constant dollars, i.e., to assume no inflation. Where assumptions about future rates of inflation would significantly alter the analyses then it would be appropriate to present conclusions in current dollars also, i.e., to "escalate" each year's costs and benefits by some specified annual rate of increase in the price level.\*

\* More details on incorporating anticipated changes in the price level are contained in Grant, et al., pp 244-253, and the article, "Project Evaluation During Inflation" (reprinted in Benefit-Cost and Policy Analysis, 1974 edition).

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The following books contain more definitive discussions of value-impact analysis (note that such discussions will be included under headings such as benefit/cost, cost/effectiveness, and systems analysis).

References cited do not provide a "cookbook" for NRC analysis because many issues faced by NRC require an analytical approach slightly different from approaches previously used.

1. Clinkscale, Robert M. "Benefit-cost Analysis Applied to Traffic Safety," Canadian Operations Research Society Journal, March 1967, v. 7, pp. 62-77. \*\*\*
2. Crystal, Royal A. and Agnes W. Brewster. "Cost Benefit and Cost Effectiveness Analysis in the Health Field: An Introduction," Inquiry, December 1966, v. 3, pp. 3-13. \*\*\*
3. Enke, Stephen. Defense Management (especially Chapter 5 "Cost Effectiveness of Cost Effectiveness," by Armen A. Alchian), Prentice Hall, 1967. \*\*
4. Fisher, Gene H., Cost Considerations in Systems Analysis (especially Chapter 3 "Concepts of Economic Cost," by R. E. Bichner) American Elsevier Publishing Co. Inc., 1971. \*
5. Grant, E.I., W. G. Ireson, and Richard Leavenworth, Principles of Engineering Economy, 1976.\* Covers all topics of project analysis. Presents many examples.
6. Hitch, Charles J. and Roland McKean. The Economics of Defense in the Nuclear Age. 1960.\* One of the first books to discuss the application of economic analysis to the allocation of resources to defense expenditures. Covers all topics discussed in these guidelines.

\* Available in NRC library.  
\*\* On order for NRC library.  
\*\*\* Available in Office of Planning and Analysis library.

7. Lowrance, William W., "Of Acceptable Risk: Science and the Determination of Safety." William Kaufmann, 1975.\* Discusses methodological difficulties in determining the optimal level of safety.
8. McKean, Roland, Efficiency in Government Through Systems Analysis (especially the first few chapters), Rand Corporation, 1958.\* General background.
9. Quade, E.S. and W. I. Boucher (eds.) Systems Analysis and Policy Planning Applications in Defense (especially Chapter 10, "The Nature of Models" by R. D. Specht, and Chapter 19, "Pitfalls and Limitations," E. S. Quade), American Elsevier Publishing Company, 1968.\* General background.
10. Prest, A.R., and R. Turvey, "Cost-Benefit Analysis: A Survey" in Surveys of Economic Theory, Volume III, Resource Allocation, St. Martins Press, 1966.\*
11. Reactor Safety Study (WASH 1400), Nuclear Regulatory Commission, 1975.
12. Weidenbaum, M. L. "Government Mandated Price Increases, A Neglected Aspect of Inflation," American Enterprise Institute for Public Policy Research, 1975.\*
13. Zeckhauser, Richard, et al. (Editors), Benefit-Cost and Policy Analysis, Aldine Publishing Co. 1974.\* Contains reprinted articles on the theory and application of policy analysis.

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\* Available in NRC Library.

Appendix 1  
CRITERIA AND WORKLOAD REQUIREMENTS FOR PREPARING  
VALUE-IMPACT STATEMENTS

Criteria

All Commission papers forwarded by the staff during the period January 1, 1977, through March 31, 1977, were reviewed to determine the workability of the "non-routine, regulatory action" criteria.

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Papers were categorized as regulatory related or not. All papers judged to be regulatory in nature were then classified as routine or recurring, or non-routine.

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A "regulatory action" is an action taken in direct support of the NRC's mission to protect the safety of, and safeguard the public, and to protect the national security and the environment. Such actions consist primarily of activities associated with issuing licenses to produce, transport or utilize nuclear material. Such actions include changes in conditions which prospective licensees must meet and changes in conditions under which existing licensees must operate. Also included are new Branch Technical Positions, proposed changes to Standard Review Plans, and new or revised regulatory guides.

Actions associated with administrative changes, although they may lead to improved agency effectiveness, are considered non-regulatory in nature. An example of the latter would be a reorganization of a program

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office. Other examples of non-regulatory actions are developing program plans, responding to congressional inquiries, signing cooperative agreements, and reviewing studies conducted by other agencies.

Certain routine or recurring regulatory actions need not be accompanied by a value-impact analysis. For example, the decision to license a particular commercial reactor or to allow the export of source material by a particular firm is preceded by an in-depth review of consequences and alternatives. The scope and depth of these reviews are based upon experience gained from many previous similar analyses. And, any unique circumstances surrounding particular license applications are subjected to special review on a case-by-case basis. Thus no new information would be provided by a value-impact analysis.

The NRC Correspondence Handbook defines four types of categories of staff papers as follows:

1. Policy. A paper which involves a major policy issue intended for discussion with the Commission.
2. Consent. A paper which describes a noncontroversial, minor policy issues which it is believed will be approved unanimously, and thus can be resolved without discussion. If unanimous approval is not attained, the paper becomes a policy item.

3. Commission Action. A paper which circulates a draft for Commissioner comment or guidance.
4. Information Paper. A paper used for forwarding informational items requiring no action.

Table I-A shows the distribution, across the four categories, of Commission papers during the period of interest.

Table I-A

<u>Category</u>	<u>Total in Category</u>	<u>Total Requiring Value-Impact Statement</u> *
Commission Actions Items	77	4
Consent Calendar Items	20	4
Policy Session Items	8	3
Information Paper	63	0

By definition papers in the fourth category would not pertain to regulatory actions. Hence no value-impact statement (VIS) need be prepared.

The first three categories all require Commission decision or guidance. Papers in these categories were reviewed and classified as pertaining

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\* A value-impact statement is a brief summary of the value-impact analysis or evaluation.

to either (1) a non-routine regulatory action, (2) a routine or recurring regulatory action, or (3) a non-regulatory action. Rather than establish a fourth classification area, papers containing supplemental staff work (or staff work which responded to Commissioners' comments on previous Commission papers) were generally classified as "routine regulatory."

Table I-B lists the Commission papers reviewed. Information papers are presented for completeness since they accounted for 38% of the total.

Papers judged to require a value-impact analysis are summarized by category in Table I-A, Table I-C presents additional information on these 11 papers.

Papers 77-14, 77-15, 77-100, 77-129 and 77-141 are proposed changes in regulations and thus automatically require a VIS. The former 3 papers, because they discuss a regulatory action which had been before the Commission previously, might be considered to be a gray area in the application of the value-impact criteria. The initial papers should have contained the bulk of the analysis and only new information need be presented in subsequent papers.

Papers 77-53, 77-75, 77-79, and 77-137 all relate to licensing conditions. All of the proposed changes would have imposed some costs on licensees or other affected parties.

Environmental statements such as the one forwarded by SECY 77-92 generally contain the same elements as would a value-impact analysis. However, it would be useful to summarize these elements in a value-impact statement when submitting the Commission papers.

SECY 77-126 represents a special case in that it discusses a non-staff proposal to change a regulation. Whether such a paper requires a VIS is largely a matter of staff judgment regarding arguments presented or inferred by the petitioner. Some petitions will be only weakly supported and will thus require little analysis in order to make a recommendation. On the other hand, there will be certain petitions which are either well supported or are thought to be by the public. Thus a VIS would be required.

SECY 77-129 discusses changes to the Code of Federal Regulations required by amendments to the Price-Anderson Act. Thus a value-impact statement could consist of a sentence such as: "Recommended action dictated by statute."

None of the papers contain a separate value-impact statement. However, papers 77-53, 77-79, and 77-126 present estimates of costs of

the proposed actions, and 77-14, 77-15, 77-92 and 77-100 contain discussion of some consequences of the proposed action in the same manner as would a value-impact evaluation.

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Certain of the papers did not include estimates of the value of the recommended action due to an absence of data or a framework for evaluation. The papers dealing with safeguards are examples. At the time these papers were written the agency was still trying to develop methods for analyzing the effectiveness of various measures to counter threats.

#### Workload

The last two columns in Table I-C provide estimates of the staff resources required to prepare the Commission papers (including background research and data collection) and the additional staff work required if the value-impact guidelines had been promulgated.

Depending on the state of the original paper, preparation of acceptable value-impact statements for these papers would require estimating cost impacts, or developing measures of value, or developing and evaluating alternatives. Based upon the estimates of workload presented above, it would appear that adoption of the guidelines would lead to relatively little additional staff work to prepare Commission Papers.



COMMISSION ACTION ITEMS

NR	SECY 77-2	EXTENSION OF NRC/W/EPRI COOPERATIVE PROGRAM
NR	SECY 77-6	DRAFT LETTER TO THE JOINT COMMITTEE ON ATOMIC ENERGY
NR	SECY 77-13	THE NUCLEAR FUEL CYCLE & THE PRESIDENT'S NUCLEAR POLICY STATEMENT
RR	SECY 77-18	PROPOSED SOURCE MATERIAL EXPORT LICENSE TO CANADA (LICENSE APPLICATION NO. SUE. SUE-3275, AMENDMENT 01)
NR	SECY 77-17	PROPOSED REPLY TO LETTER FM REP. PHILIP E. RUPPE RE BAILLY
RR	SECY 77-19	APPROVAL OF A PROPOSED LICENSE TO EXPORT LOW ENRICHED URANIUM TO JAPAN (LICENSE APPLICATION NO. XSNM-948)
RR	SECY 77-21	APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED URANIUM TO JAPAN (LICENSE APPLICATION NO. XSNM-946)
RR	SECY 77-23	REVISION OF LICENSE FEE SCHEDULE; CURRENT LICENSE FEE LITIGATION
RR	SECY 77-29	APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED URANIUM TO BELGIUM (XSNM-997)
RR	SECY 77-31	PROPOSED LICENSE TO IMPORT ENRICHED URANIUM FROM SOUTH AFRICA (LICENSE APPLICATION NO. ISNM-1663)
NR	SECY 77-33	NEED FOR EARLY DECISIONS ON PLUTONIUM RECYCLE AND WASTE MANAGEMENT
RR	SECY 77-34	ACTION PLAN TO REDUCE RADIOGRAPHY OVEREXPOSURES
NR	SECY 77-36	1976 NRC ANNUAL REPORT
NR	SECY 77-37	STUDY OF REPORTING REQUIREMENTS
NR	SECY 77-38	LETTER FROM ERDA TO CHAIRMAN ROWDEN ON COOPERATION WITH THE USSR IN LWR'S-
RR	SECY 77-42	PROPOSED LICENSE TO EXPORT SOURCE MATERIAL TO FRANCE (LICENSE APPLICATION NO. SME-8344)
RR	SECY 77-43	APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED URANIUM TO FRANCE ( LICENSE APPLICATION NO. XSNM-967)

CLASSIFICATION KEY

REG = Regulatory

RR = Routine or Recurring Regulatory

NR = Non Regulatory

RR SECY 77-44 APPROVAL OF PROPOSED LICENSE TO EXPORT HIGH ENRICHED URANIUM TO WEST GERMANY (LICENSE APPLICATION NO. XSNM-876)

RR SECY 77-47 APPROVAL OF PROPOSED LICENSE TO IMPORT LOW ENRICHED UF6 (LICENSE APPLICATION NO. ISNM-1685; DOCKET NO. 70-2424)

RR SECY 77-49 APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED URANIUM TO THE UNITED KINGDOM (LICENSE APPLICATION NO. XSNM-1021)

RR SECY 77-48 NRDC PETITION FOR RULEMAKING ON WASTE MANAGEMENT

NR SECY 77-96 ISSUANCE OF SUPPLEMENT TO NRC PUBLICATION "GUIDE & CHECKLIST" (NUREG-75/111)

RR SECY 77-97 EXPEDITING COMPLETION OF THE GESMO PROCEEDINGS

RR SECY 77-101 S-3 COMMENTS & RESPONSES -- NUREG-0216, "DISCUSSION OF COMMENTS ON ENVIRONMENTAL SURVEY OF THE REPROCESSING & WASTE MANAGEMENT PORTIONS OF THE LWR FUEL CYCLE"

RR SECY 77-52 APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED URANIUM TO SWITZERLAND (LICENSE APPLICATION NO.)

REG SECY 77-53 SSNM FUEL FACILITY - NEAR TERM UPGRADING OF SAFEGUARDS

RR SECY 77-58 S-3 COMMENTS & RESPONSES - NUREG-0216, "DISCUSSION OF COMMENTS ON ENVIRONMENTAL SURVEY OF THE REPROCESSING AND WASTE MANAGEMENT PORTIONS OF THE LWR FUEL CYCLE"

NR SECY 77-61 CIVIL PENALTIES FOR NORTHEAST NUCLEAR ENERGY COMPANY (PROPOSED LTR TO CONGRESSMAN BODD)

NR SECY 77-62 SHIPMENT OF IRRADIATED FUEL ELEMENTS THRU THE PORT OF MIAMI TO THE ERDA SAVANNAH RIVER PLANT (PROPOSED LTR TO SEN. STONE)

NR SECY 77-66 RESPONSE TO JANUARY 11, 1977 LETTER FROM CONGRESSMAN CARL D. PERKINS, U.S. HOUSE OF REPRESENTATIVES

NR SECY 77-70 INQUIRY FROM CONGRESSMAN PRICE CONCERNING SAFEGUARDS

NR SECY 77-74 APPROVAL UNDER SEC. 145b OF THE ATOMIC ENERGY ACT, AS AMENDED FOR UDALL TO HAVE ACCESS TO RESTRICTED DATA AND OTHER NATIONAL SECURITY INFORMATION

REG SECY 77-75 IMPLEMENTATION OF NATIONAL SECURITY DECISION MEMO 347,  
JAN. 20, 1977 (CONF/NSI)

RR SECY 77-76 APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED  
URANIUM TO JAPAN (LICENSE APPLICATION NO. XSNM-993)

RR SECY 77-77 APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED  
URANIUM TO JAPAN (LICENSE APPLICATION NO. XSNM-939)

NR SECY 77-78 RESPONSE TO J.W. 27, 1977 LETTER FROM CARL WALSKI, AIF

RR SECY 77-82 APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED  
URANIUM TO WEST GERMANY (LICENSE APPLICATION NO  
XSNM-1016)

RR SECY 77-83 APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED  
URANIUM TO WEST GERMANY (LICENSE APPLICATION NO. XSNM-1002)

RR SECY 77-84 APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED  
URANIUM TO WEST GERMANY (LICENSE APPLICATION NO. XSNM-1005)

RR SECY 77-85 STAFF RESPONSE TO COMMENTS ON A PAPER ENTITLED "IMPACTS  
OF LATER REVERSING A DECISION TO ADOPT OR NOT ADOPT AN  
INTERIM RULE PERMITTING CONSTRUCTION OR OPERATION OF  
NUCLEAR POWER PLANTS"

RR SECY 77-85A STAFF RESPONSE TO COMMENTS ON A PAPER ENTITLED "IMPACTS  
OF LATER REVERSING A DECISION TO ADOPT OR NOT TO ADOPT AN  
INTERIM RULE PERMITTING CONSTRUCTION OR OPERATION OF  
NUCLEAR POWER PLANTS"

NR SECY 77-87 MANCUSO STUDY (Approval of ltr to Sen. Brooke)

RR SECY 77-88 APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED  
URANIUM TO JAPAN (LICENSE APPLICATION NO. XSNM-983)

RR SECY 77-89 APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED  
URANIUM TO JAPAN (LICENSE APPLICATION NO. XSNM-984)

RR SECY 77-90 APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED  
URANIUM TO JAPAN (LICENSE APPLICATION NO. XSNM-985)

NR SECY 77-91 STATEMENT ON REACTOR LICENSING FROM AIF

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REG SECY 77-92 ENVIRONMENTAL IMPACT STATEMENT ON TRANSPORTATION OF RADIOACTIVE MATERIAL BY AIR AND OTHER MODES

NR SECY 77-93 GAO REPORT ON THE EFFECTIVENESS OF NRC'S INFORMATION GATHERING ACTIVITIES

NR SECY 77-94 LETTER TO CONG. UDALL RE URANIUM MILL TAILINGS

RR SECY 77-99 ADDITIONAL ANALYSIS ON EXPORT LICENSING

RR SECY 77-103 APPROVAL OF PROPOSED LICENSE TO EXPORT HIGH ENRICHED URANIUM TO WEST GERMANY (LICENSE APPLICATION NO. XSNM-294)

NR SECY 77-107 CORRES FROM DAVID FRANKEL, C&H ELECTRONICS, RE DIFFICULTIES IN OBTAINING A LICENSE FOR DISTRIBUTION OF SMOKE DETECTORS CONTAINING AMERICIUM 241

NR SECY 77-112 RELEASE OF INVENTORY DISCREPANCY DATA

NR SECY 77-111 GAO REPORT "IMPROVEMENTS NEEDED IN SAFEGUARDING DANGEROUS NUCLEAR MATERIAL AT COMMERCIAL FUEL PROCESSING FACILITIES

RR SECY 77-114 APPROVAL OF LICENSE TO EXPORT LOW ENRICHED URANIUM TO BELGIUM (LICENSE APPLICATION NO. XSNM-1019)

NR SECY 77-115 EEI STATEMENT CONCERNING THE NUCLEAR FUEL CYCLE

NR SECY 77-117 APPROVAL UNDER SECTION 145b. OF THE ATOMIC ENERGY ACT OF 1954, AS AMENDED, FOR CONGRESSMAN DINGELL TO HAVE ACCESS TO RESTRICTED DATA & OTHER NATIONAL SECURITY INFORMATION

RR SECY 77-118 APPROVAL OF PROPOSED LICENSE TO EXPORT SOURCE MATERIAL TO THE UNITED KINGDOM (LICENSE APPLICATION #SUE-8360)

RR SECY 77-119 ACTION REQUEST BY NRDC ET AL TO REOPEN SUBPART I

NR SECY 77-122 REVIEW & DISPOSITION OF NATIONAL SECURITY ACTION & DECISION MEMORANDA (S/NSI)

RR SECY 77-123 RESPONSE TO STATE REP. HARRY B. ASHE, STATE OF VERMONT

NR SECY 77-130 PROCEDURE FOR PROCESSING USER OFFICE RESEARCH REQUIREMENTS

RR SECY 77-132 APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED URANIUM TO WEST GERMANY

NR SECY 77-135 REPORT TO THE JOINT COMMITTEE ON ATOMIC ENERGY ON OPERATIONS UNDER THE INDEMNITY PROGRAM

REG SECY 77-137 - EXEMPTING CERTAIN SOURCE MATERIAL EXPORTS FROM AGREEMENT FOR COOPERATION REQUIREMENT

NR SECY 77-143 REORGANIZATION OF I&E HEADQUARTERS

RR SECY 77-145 APPROVAL OF PROPOSED LICENSE AMENDMENT TO EXPORT TO LOW ENRICHED URANIUM TO ITALY (LICENSE APPLICATION NO. XSNM-692, AMENDMENT NO. 01)

RR SECY 77-149 APPROVAL OF PROPOSED LICENSE TO IMPROT LOW ENRICHED URANIUM (ISNM-1682; DOCKET NO 70-2407)

NR SECY 77-151 RESPONSE TO LTRS FM THE PRESIDENT & OMB REGARDING PAPERWORK REDUCTION

RR SECY 77-157 APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED URANIUM TO JAPAN (LICENSE APPLICATION NO. XSNM-958)

NR SECY 77-162 RECOMMENDATIONS OF THE ADMINISTRATIVE CONF. OF THE U.S. INTERPRETIVE RULES OF GENERAL APPLICABILITY AND STATEMENT OF GENERAL POLICY

RR SECY 77-163 APPROVAL OF PROPOSED LICENSE TO EXPORT AT POWER REACTOR TO THE REPUBLIC OF KOREA (LICENSE APPLICATION XR-119)

RR SECY 77-164 APPROVAL OF PROPOSED LICENSE TO IMPORT FUEL ASSEMBLIES CONTAINING LOW-ENRICHED URANIUM (ISNM-1701)

NR SECY 77-165 ABNORMAL OCCURRENCE REPORT .....

RR SECY 77-168 APPROVAL OF PROPOSED LICENSE TO EXPORT SOURCE MATERIAL TO CANADA (LICENSE APPLICATION NO. SUE -8359)

RR SECY 77-169 APPROVAL OF PROPOSED LICENSE TO EXPORT LOW ENRICHED URANIUM TO WEST GERMANY (APPLICATION NO. XSNM-1043)

NR SECY 77-170 PROPOSED LETTER TO PREF. ROSE REQUESTING ASSISTANCE IN STUDY OF LWR SYSTEMS

CONSENT CALENDAR ITEMS

- NR SECY-77-7 STATEMENT OF ORGANIZATION & FUNCTIONS FOR RES
- RR SECY-77-8 FOIA DISCLOSURE POLICY - EXEMPTION FIVE
- RR SECY-77-9 TASK FORCE REPORT ON LOW-LEVEL WASTE BURIAL
- NR SECY-77-1 APPEAL FROM INITIAL DETERMINATION OF FREEDOM OF INFORMATION ACT REQUEST — ANTHONY Z. ROSMAN
- REG SECY-77-14 AMENDMENTS TO 10 CFR PART 70, PLANS FOR COPING WITH RADIOLOGICAL EMERGENCIES
- RR SECY-77-26 ABNORMAL OCCURRENCE PROGRAM POLICY STATEMENT
- RR SECY-77-32 FEDERAL REGISTER NOTICE ON THE SCOPE AND OUTLINE OF THE GENERIC ENVIRONMENTAL IMPACT STATEMENT ON URANIUM MILLING
- RR SECY-77-48A (same subj & distribution)
- NR SECY-77-51 FEDERAL REGISTER NOTICE OF FILING OF PETITION FOR RULE MAKING BY CONNECTICUT CITIZEN ACTION, GROUP, ET AL (PRM-50-19)
- REG SECY-77-100 PROPOSED MISCELLANEOUS AMENDMENTS TO 10 CFR PART 2
- RR SECY-77-9A TASK FORCE REPORT ON LOW-LEVEL WASTE BURIAL
- NR SECY-77-2B PROPOSED COST-SHARING CONTRACT WITH THE ELECTRIC POWER RESEARCH INSTITUTE (EPRI) & THE WESTINGHOUSE ELECTRIC CORP.
- RR SECY-77-63 PROPOSED REGULATIONS FOR MAKING A DETERMINATION TO WAIVE OR REDUCE FEES UNDER THE FOIA
- NR SECY-77-67 STATEMENT OF ORGANIZATION AND FUNCTIONS FOR THE OFFICE OF NUCLEAR REACTOR REGULATION
- RR SECY-77-73 ENERGY REORGANIZATION ACT OF 1974: IMPLEMENTATION OF SEC. 206, "NONCOMPLIANCE"
- RR SECY-77-79B NRC & INTERNATIONAL PHYSICAL PROTECTION STANDARDS, SUPPLEMENT TO SECY 77-79 (CONF/NSI)

CONSENT CALENDAR ITEMS

- RR    SECY 77-102    ANTITRUST HEARING ON SOUTH TEXAS PROJECT
- REG    SECY 77-126    PETITION FOR RULE MAKING FILED BY THE ATLANTIC COUNTY CITIZENS COUNCIL ON ENVIRONMENT: PROPOSED AMENDMENTS TO 10 CFR PART 50 TO REQUIRE OPERATIONS TESTING OF PILOT MODEL OR PROTOTYPE VERSIONS OF NUCLEAR POWER PLANTS PRIOR TO ISSUANCE OF A LICENSE TO MANUFACTURE
- REG    SECY 77-129    AMENDMENTS TO 10 CFR PART 140 - INCREASE IN MAXIMUM AMOUNT OF FINANCIAL PROTECTION AVAILABLE & OTHER CHANGES IN NUCLEAR ENERGY LIABILITY POLICY & INDEMNITY AGREEMENT FORMS
- NR    SECY 77-131    ANTHONY Z. ROISMAN FOIA APPEAL: INTERAGENCY STUDY ON NUCLEAR MATERIAL ACCOUNTING DATA

POLICY SESSION ITEMS

NR	SECY-77-10	REASSESSMENT OF NUCLEAR WASTE MANAGEMENT PROGRAM
REG	SECY-77-15	EARLY SITE REVIEWS FOR PLANNED NUCLEAR FACILITY AMENDMENTS TO 10 CFR PARTS 2 & 50
RR	SECY-77-28	PHYSICAL PROTECTION OF NUCLEAR POWER REACTION AGAINST INDUSTRIAL SABOTAGE [PROCEDURAL ONLY]
REG	SECY-77-79	NRC AND INTERNATIONAL PHYSICAL PROTECTION STANDARDS
RR	SECY-77-79A	REVISIONS TO SECY 77-79, NRC AND INTERNATIONAL PHYSICAL PROTECTION STANDARDS
RR	SECY-77-124	SCOPE OF THE FINAL RULE MAKING ON THE S-3 TABLE
REG	SECY-77-141	PROPOSED RULE TO REQUIRE LICENSE SAFEGUARDS CONTINGENCY PLANS
NR	SECY-77-152	ECC BYPASS RESEARCH PROGRAM



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INFORMATION PAPERS

NR	SECY 77-11	WEEKLY INFORMATION REPORT - WEEK ENDING 1/7/77
NR	SECY 77-12	CHART ON NUCLEAR POWER PLANTS
NR	SECY 77-4	CONF, NSI - RELEASE OF MUF DATA TO THE GAO
RR	SECY 77-5	PHYSICAL PROTECTION ASSESSMENT OF FULE CYCLE FACILITIES AGAINST EXTERNAL THREATS
NR	SECY 77-16	CONF - VISIT OF U.S. EXPERTS TO FRG TO REVIEW SABOTAGE PROJECTION IN NUCLEAR POWER PLANTS
NR	SECY 77-20	STATUS OF THE PWR 3-D FLOW DISTRIBUTION EXPERIMENTAL PROGRAM
NR	SECY 77-22	WEEKLY INFORMATION REPORT - WEEK ENDING 1/14/77
NR	SECY 77-25	PENDING CONTRACTUAL MATTERS REPORT NO. 37
NR	SECY 77-27	REACTOR LICENSING SCHEDULES - January, 1977 PROJECTION
NR	SECY 77-30	SYMPOSIUM ON THE PUBLIC HEALTH ASPECTS OF RADIOACTIVITY IN CONSUMER PRODUCTS
NR	SECY 77-35	WEEKLY INFORMATION REPORT - WEEK ENDING 1/21/77
NR	SECY 77-39	SAFEGUARDS UPGRADING PROJECT
NR	SECY 77-40	PENDING CONTRACTUAL MATTERS REPORT NO. 38
NR	SECY 77-41	ERDA POLICY FOR INSTITUTIONAL PLANNING
RR	SECY 77-45	LICENSING OF NEW ERDA WASTE TANKS AND BINS (SECY-76 150)
NR	SECY 77-50	WEEKLY INFORMATION REPORT - WEEK ENDING 1/28/77
NR	SECY 77-98	PENDING CONTRACTUAL MATTERS REPORT NO. 41
RR	SECY 77-54	AS LOW AS REASONABLY ACHIEVABLE -- OCCUPATIONAL RADIATION EXPOSURE
NR	SECY 77-55	BRIEFINGS ON IMPORTANT SAFETY ISSUES
NR	SECY 77-56	REPORTING TO FEDERAL DISASTER ASSISTANCE ADMIN (FDAA) ON WEATHER/FUEL RELATED PROBLEMS

Information Papers

RR SECY 77-57 ENVIRONMENTAL STANDARD REVIEW PLANS

RR SECY 77-53A NEAR TERM UPGRADING OF SSNM FUEL FACILITY SAFEGUARDS  
(SECY 77-53)

RR SECY 77-53B NEAR TERM UPGRADING OF SSNM FACILITY SAFEGUARDS  
(SECY 77-53)

NR SECY 77-59 WEEKLY INFORMATION REPORT - WEEK ENDING 2/4/77

RR SECY 77-60 FURTHER STEPS ON PROPOSED EXPORT OF HIGH ENRICHED  
URANIUM TO SOUTH AFRICA (APPLICATION XSNM-690)  
(CONF./NSI)

RR SECY 77-65 CHART ON NUCLEAR POWER PLANTS

RR SECY 77-69 ANALYSIS OF THE EFFECTS OF NATURAL PHENOMENA ON  
EXISTING PLUTONIUM PROCESSING & FABRICATION PLANTS

NR SECY 77-71 PCM #39

NR SECY 77-72 DR. LIVERMAN'S BRIEFING ON ERDA'S SURVEY OF CONTAMINATED  
EXCESS PROPERTIES

NR SECY 77-80 REACTOR LICENSING SCHEDULES -- FEBRUARY 1977 PROJECTIONS

NR SECY 77-86 WEEKLY INFORMATION REPORT - WEEK ENDING 2/11/77

NR SECY 77-95 IAEA ADVISORY GROUP MEETING ON PHYSICAL PROTECTION:

NR SECY 77-104 PENDING CONTRACTUAL MATTERS REPORT NO. 43

NR SECY 77-106 NRC MANAGEMENT DEVELOPMENT PROGRAM

NR SECY 77-108 WEEKLY INFORMATION REPORT - WEEK ENDING 2/18/77

RR SECY 77-109 MEMBER STATE REVIEW OF INTERNATIONAL ATOMIC ENERGY  
AGENCY (IAEA) SAFETY CODE OF PRACTICE ON QUALITY  
ASSURANCE FOR NUCLEAR POWER PLANTS

NR SECY 77-110 PENDING CONTRACTUAL MATTERS REPORT NO. 45

NR SECY 77-113 WEEKLY INFORMATION REPORT - WEEK ENDING 2/25/77

NR SECY 77-116 EVALUATION OF MIPC RAINBOW BOOKS

Information Papers

NR SECY 77-121 WEEKLY INFORMATION REPORT - WEEK ENDING 3/4/77

NR SECY 77-125 INFORMATION SUPPLIED TO MR. GEORGE F. MURPHY CONCERNING THE AUGUST 1976 SHUTDOWN OF THE HIGHLY ENRICHED URANIUM OPERATIONS AT BABCOCK & WILCOX, PENNSYLVANIA FACILITIES

NR SECY 77-127 MEMBER STATE REVIEW OF IAEA SAFETY CODE OF PRACTICE ON DESIGN OF NUCLEAR PLANTS

NR SECY 77-128 ATWS - FORMATION OF TASK GROUP

NR SECY 77-133 WEEKLY INFORMATION REPORT - WEEK ENDING 3/11/77

NR SECY 77-134 CHART ON NUCLEAR POWER PLANTS

NR SECY 77-136 REACTOR LICENSING SCHEDULES -- MARCH, 1977 PROJECTION

RR SECY 77-138 LOCATING NRC INSPECTORS NEAR REACTOR SITES-TRIAL PROGRAM

NR SECY 77-140 CONTROL OF OPERATING AND CONSTRUCTION COSTS

RR SECY 77-142 REPORT OF SAFEGUARDS MEETINGS WITH IAEA

NR SECY 77-144 INFORMATION EXCHANGE ARRANGEMENT & PROPOSED CONSULTING AGREEMENT WITH THE ATOMIC ENERGY ORGANIZATION OF IRAN

NR SECY 77-146 PCM NO. 44

NR SECY 77-147 RADIATION EXPOSURE OF CARGO WORKERS

NR SECY 77-148 WEEKLY INFORMATION-WEEK ENDING 3/18/77

RR SECY 77-150 NFS, WEST VALLEY, NY - STAFF ACTIONS IN CONNECTION WITH TERMINATION OF FUEL REPROCESSING & DISPOSAL OF HIGH LEVEL LIQUID WASTES

NR SECY 77-153 NRC STAFF DETAILS TO INTERNATIONAL ORGANIZATION

NR SECY 77-154 FUEL CYCLE COSTS

NR SECY 77-155 DRAFT REPORT OF THE NRC NARM TASK FORCE

NR SECY 77-159 SALZBURG CONF. FOR A NON-NUCLEAR FUTURE

NR SECY 77-158 WEEKLY INFORMATION REPORT-WEEK ENDING 3/25/77

NR SECY 77-160 MEMBER STATE REVIEW OF IAEA SAFETY GUIDE SG-01,  
"STAFFING, RECRUITMENT, TRAINING AND AUTHORIZATION  
OF OPERATING PERSONNEL"

NR SECY 77-166 BACKLOG OF FUEL CYCLE LICENSING RENEWALS WITH EMPHASIS  
ON B&W IN PARTICULAR

RR SECY 77-167 AMENDMENTS OF REGULATIONS TO DELETE CERTAIN REPORTING  
REQUIREMENTS

NR SECY 77-171 STATUS OF PENDING EXPORT LICENSE APPLICATIONS

TABLE I-C

COMMISSION PAPERS REQUIRING VALUE-IMPACT STATEMENT (VIS)

<u>SECY NO.</u>	<u>SUBJECT*</u>	<u>COMMENTS</u>	<u>PREPARATION TIME**</u>	<u>ESTIMATED ADDITIONAL PREP. TIME FOR VIS***</u>
77-14	Amendments to 10 CFR 70 Plans for Radiological Emergencies (SD)	Grey area of application of value-impact criteria**** No VIS.	20	
77-15	Amend 10 CFR 2 & 50: Early Site Review (ELD)	Grey area****	150 (60, ELD; 90 NRR)	15*****
77-53	SSNM Fuel Cycle Facilities- Upgrade Safeguards (NMSS)	Estimated impact but not value	17	3
77-75	Implementation of National Security Memorandum 347 (NMSS)	No VIS. Could have estimated impac. on licenses	14	2
77-79	NRC Physical Protection Standards vs. International's (NMSS)	Contains differences in costs associated with adopting international standards. No estimates of value.	30	3
77-92	Environmental Statement on Transportation of Radioactive Material (SD)	Some evaluation of value and impact. Recommended analysis of alternatives for follow-on work.	4.5 staff years	Whatever time necessary to analyze alternatives

\* Originating office in parenthesis.

\*\* In staff days unless otherwise noted.

\*\*\* Additional staff days required to prepare Value-Impact Statement. (PLA estimate except where noted.)

\*\*\* See text for elaboration

\*\*\* Estimated by program office

SECY NO.	SUBJECT*	COMMENTS	PREPARATION TIME**	ESTIMATED ADDITIONAL PREP. TIME FOR VI ***
77-100	10 CFR 2: Proposed Changes to Rules of Practice in Licensing Reviews (ELD)	Contains pro/con discussion	30	2
77-126	Petition for Amendments to 10 CFR 50 (SD)	Analysis of petition required on a selective basis depending on substance of petitioner's arguments. Had pro/con discussion of value and impact. Preparation of VIS would only require "reformatting."	6 months	Less than 1
77-129	Amendments to 10 CFR 140, Price/Anderson Act (NRR)	Recommendations and alternatives dictated by statute. VIS would so state.	30****	Less than 1
77-137	Exemptions: Certain Source Material Export Agreements (IP)	A portion of recommendation would lead to additional transaction costs.		1
77-141	Proposed Rule: Require Licensee Safeguard Contingency Plans (NMSS)	No VIS, could estimate cost to licensees of producing such plans.	15	2

\* Originating office in parenthesis.  
 \*\* In staff days unless otherwise noted.  
 \*\*\* Additional staff days required to prepare Value-Impact Statement.  
 \*\*\*\* Estimate.

VALUE-IMPACT AND RELATED CONCEPTS

The use of the terms "value" and "impact" was initially recommended by NRC staff who felt that the terms "benefits" and "costs" carried the connotation of being measured only in dollars and, hence, were too restrictive. The staff defined value and impact to include non-commensurables, and variables which are non-quantifiable or non-measurable. Thus, it was argued that the new terms would allow for analysis to incorporate very important but non-quantifiable judgments of the staff and other expert parties. It should be noted that cost-benefit and cost-effectiveness analyses, properly conducted, have just as broad a scope as that envisioned by the staff for value-impact analysis. The origin of these analytical techniques is discussed below.

Analytical techniques were developed for making decisions about military resources during World War II. American cargo ships were being sunk regularly by the German U-boats. The question the U.S. analysts had to answer was: How can we maximize the amount of commodities reaching the original destination, (or, alternatively, minimize the number of transport ships sunk) in light of the fact that we were constrained to a particular number of transport ships and a particular number of escort ships? Note that there were two elements to the problem. First, there was an

Enclosure F

objective which was stated in measurable terms (maximize this or minimize that). Second, there were constraints placed on the amount of resources (in this case, ships) available. These constraints were imposed in recognition of the fact that the use of additional ships for convoy purposes would reduce the number of ships (and fuel) available to wage the war at sea. Since these "resources" (i.e., ships and their supplies) would have had alternative uses the analysts could not assume that additional resources would be costless or free goods.

After the war, these analytical techniques were modified somewhat by the Rand Corporation in order to address issues related to decisions to be made by the U. S. Air Force. For example, one issue that was addressed concerned the amount of damage that could be inflicted on an enemy by alternative forces of bombers which carried nuclear bombs. In this analysis the total budget available for the "purchase" of a force was held constant (i.e., the budget was the constraint) while the bombers and the bombs were considered to be variable in both quantity and quality (e.g., the performance characteristics of either could be changed). In this latter application the analysis was commonly referred to as systems analysis or cost-effectiveness analysis. It is similar to value-impact analysis for those instances in which "value" cannot be measured in monetary terms.



Cost-benefit analysis, although similar in technique to cost-effectiveness analysis, had an entirely different origin. The former is based on a concept espoused by J. Dupuit, a French engineer, in the 19th Century. Dupuit was interested in the question of the utility of a particular public investment such as a new bridge to the citizens of a locale. Since the citizens do not "purchase" a bridge, we cannot merely obtain market data to answer the question. However, under certain conditions we can estimate the value of the investment to the citizens, through inference. Cost-benefit analysis was applied early in the 20th Century on a routine basis by the U.S. Army Corps of Engineers to justify the building of canals. During this early period, benefits and costs were generally estimated in monetary terms.

In practice the scope of cost-benefit analysis has been expanded to include all ramifications (desirable and undesirable) associated with, say, constructing a particular project. Implementation of the National Environmental Protection Act (NEPA) has accelerated this trend. Note that it may not be possible to quantify all benefits (or costs). And other benefits (or costs) may not be translatable into a monetary equivalent. Thus, cost-benefit analysis can be used in a manner as inclusive as that envisioned for value-impact analysis.

The following working definitions sometimes facilitate analysis.

1. Benefit - A cost avoided.
2. Cost - A benefit foregone.

Costs and benefits as generally estimated are mirror images of each other and it is often arbitrary whether a consequence is categorized as one or the other. For example, suppose that two "systems" or approaches to a problem were equally effective in accomplishing a particular objective. Suppose that system A (the status quo) had a one-time cost of \$100 and System B had a one-time cost of \$50. The "benefit" of selecting System B (assuming neither system entailed any non-monetary costs) is the cost savings of \$50. Alternatively the cost of remaining with Alternative A is the \$50 in "benefit" foregone (i.e., the alternatives which the \$50 could have effected).

Subsequent to the enactments of NEPA all applicants for commercial reactor licenses must prepare an environmental statement. In the benefit-cost section of these statements a portion of the benefit has been defined as the increase in electricity generated by a nuclear power plant. In conventional benefit-cost analysis the benefit would be restricted to the differential in costs (including economic and environmental impacts) between a nuclear and a coal-fired station. Some of the costs are estimated in monetary terms

(e.g., the relative construction and generating costs of nuclear stations compared with alternatives) and some in physical terms (e.g., magnitude of effluent releases).

The instances in which the "classical"\* cost-benefit approach, rather than cost-effectiveness approach, might be applied to NRC policy issue are somewhat limited. Issues involving property damage or premature loss of life might be examples. The difficulty is in getting agreement on a dollar amount to use in estimating the cost of premature loss of life. For example, the 1973 evidentiary hearings on the appropriate monetary value to use to estimate the worth of reduction of radiation doses to the population resulted in 4172 pages of hearing transcript. As a result, the Commission directed that \$1000 per total-body man-rem and \$1000 per man-thyroid-rem (or lesser values demonstrated to be suitable by the applicant for a license) shall be used as an interim value to meet the criterion "as low as practicable" (later modified and called "as low as reasonable achievable" — ALARA) for reducing radio-active material in light-water-cooled nuclear power reactor effluents (see 10 CFR Part 50, Appendix I). In this instance value-impact is the same thing as classical cost-benefit analysis (if, individuals were willing to pay the exact dollar amount specified by NRC to avoid being exposed to a man-rem, and the only consequences associated with the

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\* "Classical" in the sense that all positive and negative consequences can be compared in money terms.

introduction of new radwaste equipment concerned equipment cost and population health effects).

Development of inflationary impact statements,\* as required by OMB Circular A-107 (issued January 28, 1975); requires essentially the same type of analytical techniques discussed above. For example, if costs of a particular action were greater than its benefits, then the action would probably result in an increase in the price of a product and thus would be inflationary.

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\* Executive Order 11949 changed the title from Inflationary Statement to Economic Impact Statement.

THREE EXAMPLES OF VALUE IMPACT ANALYSIS:

The first example, inerting of containment, concerns a proposed amendment to the Code of Federal Regulations. It is an abridgement of the actual material which accompanied the Commission paper. That analysis would have been enhanced if the alternatives to inerting, i.e., purging or the use of recombiners, were discussed in the text rather than just included in a table.

The second and third examples are applications of the office specific guidelines developed by the Office of Standards Development. Most value-impact statements sent to the Commission could be much briefer than the latter two examples which are developed primarily for review by technical staff. For completeness, the second value-impact evaluation should have included an estimate of the licensee costs associated with the technical alternatives.

1. INERTING OF CONTAINMENT (SUMMARIZED FROM ORIGINAL)

BACKGROUND

In some small containments (for a few boiling water reactors) the combustible gas control system would not be able to accommodate the large concentration of hydrogen associated with the metal-water reaction immediately following a LOCA. Hydrogen recombiners can process the containment atmosphere at the rate of only 100 scfm per recombiner. Therefore, for a non-inerted 300,000 cubic foot containment with a 13 volume percent hydrogen concentration that was generated during the first two minutes of the LOCA, an inordinately large number of recombiners would be required. The purpose of inerting the containment is to provide an atmosphere with a reduced oxygen concentration so that high temperatures and pressures will not occur as a result of rapid reactions between the hydrogen released from the metal-water reaction immediately following

a LOCA and the oxygen already present in the containment. The combustible gas control system of an inerted containment should be able to process the hydrogen before it interacts with the oxygen generated subsequently by radiolytic decomposition of the post-accident emergency core cooling solutions.

#### PLANTS AFFECTED

The newer BWR design with the Mark III containment concept and the BWR/6 reactor have significantly larger containment volumes, and a positive mixing capability is provided to utilize the large containment volume and thereby preclude the need to inert. In addition, as a result of revised regulations, (10 CFR Part 50.46, and Regulatory Guide 1.7), it is anticipated that the number of older plants requiring inerting will be reduced from 35 to 5.

#### DISSENTING VIEWS TO STAFF POSITION

The Appeal Board, in its Vermont Yankee ruling, identified the following potential adverse consequences of inerting:

- (1) A reduced inspection capability resulting from the presence of an inert atmosphere.
- (2) Hazards to plant personnel that could result from entries into a containment that has been deinerted but which may still have nitrogen pockets.
- (3) Additional radiation exposure, of the order of 50-100 millirems, to plant personnel who are required to survey the containment after it is deinerted to assure that the atmosphere is breathable.

The staff has carefully reviewed these allegations and has concluded that, due to complementary safety practices and anticipated maintenance procedures on the part of licensees, that there will be no adverse safety and health effects associated with the Appeal Board's concern.

VALUE AND IMPACT EVALUATION

Alternatives are\*

- . Retain Status Quo
- . Inerting
- . Purging
- . Recombiners

The NRC staff surveyed a number of operating reactors to determine the range of costs due to containment inerting. Table III-A summarizes the information that was obtained. The lost production time per year associated with inerting and deinerting activities is mainly from deinerting after unscheduled shutdowns with a small fraction of the time being spent surveying the containment atmosphere for nitrogen pockets. Normally a plant can begin to deinert 24 hours before a schedule shutdown and is not required to reinert until 24 hours after startup. Therefore, deinerting and reinerting can be accomplished while the plant is operating. Average costs per year per

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\* Only inerting is discussed in text, see Table III-B for comparison with other alternatives.

plant associated with inerting range from \$12,500 to \$507,000 with a potential peak of \$652,000. Assuming that after submission of acceptable evaluations as required by 50.46(a) five plants are required to inert, the annual national costs would range from approximately \$62,500 to \$2,534,560 with a potential peak of \$3,260,000.

We estimate that 5 plants each inerting and reinerting five times a year would conservatively consume less than 0.004 percent of the annual nitrogen production of the United States. We also estimate this amount of nitrogen to be about 25 tank truck loads. Appendix C to WASH-1238, "Environmental Survey of Transportation of Radioactive Materials to and from Nuclear Power Plants," notes that for the year 1969 the following were the accident statistics for trucks from common (nonradiological) causes: probability (accidents per vehicle-mile) =  $1.7 \times 10^{-6}$ ; injuries per accident = 0.51; and fatalities per accident = 0.03. Assuming each truck delivering nitrogen will travel 500 miles, the total number of truck miles would be about 13,500 per year. Based on the above data, it is estimated that this would cause about 0.02 accidents, 0.01 injuries, and 0.001 fatalities per year. Property damage from truck accidents in 1969 was approximately \$1800 per accident. Using this value it is estimated that there would be property damage in the amount of \$36 per year from nitrogen tank truck accidents. This analysis neglects the fact that a truck accident with liquified nitrogen might have greater consequences due to its low temperature. However, even



conservatively assuming that the consequences of a liquid nitrogen tank truck accident could be a factor of 10 greater than the values we have used, the resulting consequences are sufficiently small as to be neglected. The DOT does not think that the transport of liquid nitrogen is a significant safety hazard and believes that our assumption that the consequences of a liquid nitrogen tank truck accident could be a factor of 10 greater than those for trucks in general is very conservative.

Consideration is already made of the potential hazard of nitrogen at the reactor facility. Regulatory Guide 1.78, "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release," identifies nitrogen as a hazardous chemical. Asphyxiating chemicals such as helium and nitrogen are considered in the control room design if a significant fraction of the control room air could be displaced as a result of their release.

In summary, inerting is being eliminated in many cases with no decrease in public safety, and with a decrease in operating cost. In these cases, the level of public safety is maintained because the safety margin afforded by inerting is more than compensated for by the more restrictive limitations placed on operating conditions of the fuel. For those plants that are still required to operate with an inerted containment, Table III-B summarizes the various alternatives that were considered and their impact.

TABLE III-A Survey of Inerting Costs

	Plant							
	Monticello	Duane Arnold	Quad Cities Unit 1	Quad Cities Unit 2	Dresden Unit 2	Dresden Unit 3	Peach Bottom Unit 2 & Unit 3	Cooper
Average Number of Times per Year Deinerted	4	4	5	5	7.0	4.2	18 station	4
Total cost per Year for Nitrogen	\$22,000	\$12,500	\$10,650	\$10,650	\$19,412	\$10,500	\$66,366 station	\$80,000
					\$30,000 cost to station			
Lost Production Time per Year Associated with Inerting and Deinerting	48 hours	0	50 hours	50 hours	78 hours	42 hours	21 hours station	16 hours
Replacement Power Cost per Day	\$120,000 to \$195,000*	--	\$150,000 <sup>†</sup>	\$150,000 <sup>†</sup>	\$150,000 <sup>†</sup>	\$150,000 <sup>†</sup>	\$412,000 to \$507,000 station	\$335,000 to \$616,000
Total Cost per Year for Nitrogen and Replacement Power Due to Lost Production Time	\$502,000 to \$652,000**	\$12,500	\$331,000	\$331,650	\$507,000	\$273,000	\$513,000 station	\$301,000 to \$516,000

\* Potential peak power cost for summer 1976.

\*\* Assuming peak cost 50 percent of the time.

† Average cost to Commonwealth Edison

TABLE III-B Control of Hydrogen from H-W Reaction Immediately (2 min.) After LOCA  
(For the estimated 5 plants that will still be required to inert)

<u>Alternative</u>	<u>Potential Radiation Dose</u>	<u>Cost of Implementing</u>	<u>Developmental Work</u>	<u>Comments</u>
Inerting	0	\$12,500 to \$507,000	None	Appeal Board Decision Against Inerting Vermont Yankee
Purging	0	\$1,400,000 capital cost \$120,000 annual operating cost (Does not account for loss in production time associated with mainte- nance of these systems)	Very little	Will have to purge immediately after LOCA with maximum radiation in containment Must therefore have filtering system capa- ble of 150,000 cfm. Represents a radical departure from the passive containment concept that is presently required by NRC.
Recombiners	595 rem*	\$200,000 per 100 cfm unit	None for present units. However, a major effort would be required to develop a sys- tem to handle 150,000 cfm.	Recombiner must operate immediately after accident and must handle 150,000 cfm. This would require about 1,500 currently available units or undertaking a major developmental program that may or may not succeed in producing 150,000 cfm units in a reasonable time period. The calcu- lated dose assumes loss of containment integrity because of inability of cur- rently available units to handle lar- ge amounts of hydrogen rapidly. This is the same release as if the plant had not been inerted.

\* Assumes no fuel failure, however, transient occurred before LOCA and resulting iodine spike is at Technical Specification limit of 4  $\mu\text{Ci/gm}$  I-131 equivalent.

2. PRELIMINARY VALUE/IMPACT ASSESSMENT ON  
NORMAL WATER LEVEL AND DISCHARGE AT NUCLEAR POWER PLANTS

I. The Proposed Action

A. Description

Some structures at most nuclear power plants are subject to continual loading from ambient ground water levels, from flows and water levels in streams, or from water levels in lakes, reservoirs or oceans. In considering the effects of design basis natural and accidental events, such as earthquakes, tornadoes, hurricanes, plane crashes, transportation accidents, explosions, fires, or LOCA, it is necessary to include the loading from the water level (or discharge) in the design calculations, as well as the loads on the structure caused by the design basis event. The proposed action will provide guidance on acceptable methodology and data sources for determining these "normal" water levels and discharges.

B. Need for the Proposed Action

No definition of the normal water levels and discharges to be used coincidentally with design basis events has been published by NRC, nor has the practice of applicants or the staff in this respect been uniform. Delays in acceptance of structures have occurred because of this lack of uniformity. A definite need for criteria covering this parameter exists.

C. Value/Impact of the Proposed Action

1. NRC

The normal water level or flow proposed by the applicant will be determined by the same methodology as that used by the staff. In most cases, determination of the values is fairly precise and is not highly dependent on interpretation or engineering judgment. Therefore, there should be a minimum of cases where the applicant and the staff disagree radically on the value. It is estimated that use of the methodology to be proposed will not average more or less staff time than for the various methods previously used.

2. Other Government Agencies

Not applicable, unless the government agency is an applicant, as TVA.

3. Industry

The value/impact on applicants will be the same as for the NRC staff. Determination of the proposed normal levels

or discharges is estimated to require from one to five man-days on the average. It is believed that this compares favorably with the time required for previous approaches. Some economic savings (possibly up to several thousand dollars) would accrue to applicants in those cases which could have been disputed by the staff, using the existing procedures.

4. Public

No impact on the public can be foreseen. The only identifiable values are a minor decrease in cost of nuclear power plants and a slight acceleration in the review process.

D. Decision on the Proposed Action

Guidance should be furnished on normal water levels and discharges.

II. Technical Approach

A. Technical Alternatives

The proposed action requires specification of three primary parameters each of which can be expressed in alternative terms. The primary parameters are:

- Frequency of occurrence of normal
- Length of record to be used
- Seasonality of events

Alternative approaches to specifying these parameters are described in the following section.

B. Discussion and Comparison of Technical Alternatives

1. Frequency of occurrence of normal

Because the design basis events are of low probability of occurrence, the simultaneous occurrence of the normal water level (or discharge) should logically be of high probability. Two alternatives were considered as definitions of the normal, the mean and the median.

The mean and the median will be essentially the same for most water bodies, including ground water, oceans, lakes and reservoirs. This is because such bodies do not have rapid changes from low to high and the range between the extremes is relatively small. For streams and estuaries, however, the mean is almost invariably higher than the median, because of the greater effect of floods on the mean.

As a simplified example, the annual mean for a year of stream flow record with only one flash flood could be higher than the flow on all days except the day of the flood. The median, of course, by definition is the point at which the flow on half the days is higher and half lower.

2. Length of record to be used

Thirty to fifty years of record has traditionally been considered to be a minimum sample to produce meaningful hydrologic characteristics. Another approach would be to leave the period of record unspecified but to require that it be long enough to cover major cycles in the data, such as wet and dry periods for streamflow, or the 19-year (plus) cycle in lunar tides.

3. Seasonality of events

Some design basis events (earthquakes, plane crashes, transportation accidents, explosions, fires, and LOCA) may occur at any time of year. Other events (floods, tornadoes, and hurricanes) may be seasonal. Two alternatives were considered, i.e., to consider the seasonality of the design events, or to ignore it.



An example of a seasonal event is a hurricane. They are more numerous during September and October. Coincidentally, this is the season of high flow in southern Florida, but the season of low flow in Texas. Thus, if the median were based on the entire year, it would be too low in Florida, but too high in Texas.

C. Decision on Technical Approach

1. While the mean would be more conservative for streams and estuaries, the median is considered of sufficient conservatism.
2. While 50 years of data is desirable, in some cases records of that length are not available. Therefore, it was decided to recommend 50 years but to accept a shorter record (not less than 12 years) if it could be demonstrated that major wet and dry periods were included. A 20-year period should be used for oceans and for estuaries that are strongly influenced by tide.
3. The normal should be determined on the basis of data for that part of the year in which the design basis event is likely to occur.

III. Procedural Approach

A. Procedural Alternatives

Potential SD procedures that may be used to promulgate the proposed action and technical approach include the following:

- Regulation
- Regulatory Guide
- ANSI Standard, endorsed by a Regulatory Guide
- Branch Position
- NUREG

B. Value/Impact of Procedural Alternatives

A NUREG is not a viable alternative because the guidance will contain positions. No ANSI standard on the subject is under preparation. Because of the time (2 to 3 years) for preparation of an ANSI standard, this alternative was eliminated. The matter is not of sufficient importance to justify issuance of a regulation. Only a Regulatory Guide or a Branch Position are viable alternatives.

Branch Positions are sometimes prepared for guidance of this sort. Because of the limited distribution of Branch Positions, however, they should be followed by a Regulatory Guide. In this case, no Branch Position has been prepared or is anticipated.

C. Decision on Procedural Approach

A Regulatory Guide should be prepared.

IV. Statutory Considerations

A. NRC Authority

This guide would fall under the authority and safety requirements of the Atomic Energy Act. In particular under General Design Criterion 2, Appendix A, 10 CFR 50, which requires, in part, that structures, systems and components important to safety be designed to withstand natural phenomena.

B. Need for NEPA Assessment

The proposed action is not a major action, as defined by 10 CFR 51.5(a)(10), and does not require an environmental impact statement.

V. Relationship to Other Existing or Proposed Regulations or Policies

When Regulatory Guide 1.70 (Standard Format and Content) is revised, mention of the necessity to evaluate normal levels and flows should be added. It will not be necessary to include, in Regulatory

Guide 1.70, all of the material on methodology and data sources which is contained in the proposed guide.

As the normal level and discharge is usually a relatively minor contributor to structure loading when design basis events are considered, it is probable that backfitting will not be necessary. The criteria have most likely been approximated with sufficient accuracy that no structure designs will have to be changed.

VI. Summary and Conclusions

A Regulatory Guide on normal water levels and discharges should be prepared. Suggested methods for determining the normal water level (or discharge) should be given for ground water, streams, estuaries, lakes, reservoirs, and oceans. Seasonality and duration of the design basis events should be considered as appropriate, and sources of data given.

References

None.

Donald L. Milliken  
3/18/77

- 14 -

3. PRELIMINARY  
VALUE-IMPACT ASSESSMENT  
ON  
GUIDANCE TO APPLICANTS CONCERNING  
ATMOSPHERIC DISPERSION MODELS FOR POTENTIAL ACCIDENT  
CONSEQUENCE ASSESSMENTS

I. The Proposed Action

A. Description

Guidance to applicants concerning procedures for determining appropriate dispersion conditions for assessing the consequences of potential reactor accidents which are made to determine the exclusion zone area, low population zone and population center distance as stated in Section 100.11 of 10 CFR Part 100.

B. Need for the Proposed Action

Recently collected experimental data have established a basis for more accurate evaluations of diffusion conditions near nuclear power plants during light wind speed and relatively stable atmospheric conditions. Recent Hearing experience (e.g., San Onofre) has identified a need to estimate dispersion conditions at locations along the site boundary.

C. Value-Impact of Proposed Action

1. Nuclear Regulatory Commission (NRC)

A reduction of valid criticisms that current staff procedures can be arbitrarily too conservative may be expected. Consequently, a reduction in staff effort required to analyze alternatives to present Standard Review Plan procedures, presented by applicants, could be expected.

By considering the directional variability of site boundary distances and the observation that adverse meteorological dispersion conditions may occur more or less frequently whenever the wind flow is from certain directions than from others, the identification of the radiological risk from potential accidents, to individuals and population segments at specific locations around a plant site, would be facilitated. Further, the use of more representative meteorological models to simulate atmospheric dispersion would produce more accurate estimates of relative atmospheric dispersion values.

The credibility of the NRC staff's safety evaluations would be enhanced by the recognition that state-of-the-art atmospheric dispersion methodology is being utilized in the determination of the appropriate dispersion conditions to be used in evaluating the site.

No measurable increase in regulatory staff workload is anticipated in utilizing the proposed procedures, in spite of increased data handling, since the entire analysis is computerized. A reduction in workload may, in fact, occur because of the reduced number of analyses required per case.

## 2. Other Government Agencies

Applicant agencies (e.g., TVA, ERDA) would be affected as presented below under Industry.

Some additional workload would be anticipated within the National Oceanic and Atmospheric Administration, U.S. Department of Commerce and the U.S. Environmental Protection Agency and analogous State and local agencies in reviewing the proposed procedures should they be issued for public comment.

## 3. Industry

Applicants would benefit from a more accurate review by the staff and an increased uniformity of safety requirements in that;

- a. consideration is given to the directional variability of site boundary distances,
- b. consideration is given to the fact that, at individual sites, adverse dispersion conditions may occur more frequently when the wind flow is from some directions than from others, and
- c. it is acknowledged that recent experimental data support the existence of enhanced diffusion, due to air flow meander under stable atmospheric conditions with light wind speeds, near the sources of effluent releases to the atmosphere.

The incidence of expensive controversies between the applicants and NRC staff, concerning the valid criticism that current staff review procedures can be arbitrarily too conservative, would be reduced.

At many sites, a reduction in exclusion zone distances and/or technical specification limitations (e.g., containment leak rates) could be expected to result from the proposed procedures as opposed to evaluations made using the current methodology. However, at some sites, particularly coastal locations, an increase in exclusion zone distance requirements and/or technical specification limitations may be anticipated.

#### 4. Public

The current site evaluation methodology may overestimate the risk to public health and safety at sites with long site boundaries in the direction of prevailing winds or at sites with short site boundaries in directions toward which wind flow is relatively infrequent or occurs primarily under favorable dispersion conditions. The risk to the health and safety of the public may be underestimated, using the current methodology, at sites with short site boundary distances in the direction of prevailing wind flow or in directions toward which wind flows occur primarily under unfavorable dispersion conditions. The proposed change in methodology would be expected to reduce both overestimates and underestimates of the risk to the public by considering both actual site boundary distances by direction, and the directional variation of atmospheric dispersive mechanisms.

Further, the improvement in the mathematical models used to stimulate diffusion of effluents in the atmosphere, based upon actual releases and subsequent sampling of tracer materials, would result in a more accurate calculation of relative atmospheric dispersion ( $\chi/Q$ ) values used in the site evaluation process.

Therefore, increased confidence in the validity of the atmospheric dispersion conditions used in assessing the risk to public health and safety, resulting from the operation of nuclear power plants, would be expected to result from the implementation of the proposed procedure.

D. Regulatory Authority

Section 50.34 of 10 CFR Part 50 requires that each applicant for a construction permit or operating license provide an analysis and evaluation of the design and performance of structures, systems and components of the facility with the objective of assessing the risk to public health and safety resulting from the operation of the facility. This section further states that the site evaluation factors identified in 10 CFR Part 100 shall be included in the analysis and evaluation described above. Section 100.10 of 10 CFR Part 100 states that meteorological conditions at the site and in the surrounding area are to be included in the factors to be considered when evaluating sites.

E. Need for NEPA Assessment

Specifically, the proposed action applies to the evaluation of structures, systems and components which are planned and will be constructed in accordance with whatever design requirements are deemed necessary based upon the evaluation as required in accordance with Section 50.34 of 10 CFR Part 50 and Sections 100.10 and 100.11 of 10 CFR Part 100. However, Chapter 7, Environmental Effects of Accidents of Regulatory Guide 4.2, Preparation of Environmental Reports for Nuclear Power Stations states that the applicant should provide a discussion of the potential environmental effects of accidents involving the station, based upon the requirements of 10 CFR Part 51 and a proposed Annex to Appendix D of 10 CFR Part 50 which has been superseded by 10 CFR Part 51. For station accidents involving radioactivity, Section 7.1 of Regulatory Guide 4.2 recommends that the  $x/Q$  values to be used in assessing the environmental effects of accidents be based upon either onsite meteorological data at the 50% probability level or at 10% of the levels in Regulatory Guides 1.3 and 1.4.

Since the proposed changes could affect the determination of the 50% probability level of meteorological data and would supersede the information in Regulatory Guides 1.3 and 1.4, the implementation of the proposed change appears to require a NEPA assessment.

F. Decision on Proposed Action

It is judged that adverse impacts are more than offset by favorable impacts and values, and that the proposed action should be accomplished.



## II. Alternative Methods of Accomplishing Action

### A. Alternatives

Alternative methods of accomplishing the action are:

1. NRC Regulation
2. ANSI Standard, endorsed by Regulatory Guide
3. NUREG
4. Branch Position, and
5. Regulatory Guide.

### B. Value Impact of Alternatives

#### 1. NRC Regulation

A Regulation would legally require conformance to a specified atmospheric dispersion evaluation methodology. However, a Regulation would not generally be expected to cover licensing requirements for an atmospheric dispersion modeling technique in the detail considered necessary, and which is expected to be provided by the proposed action. Further, should the need arise because of technological advances, it would be more difficult to revise or change a regulation than it would the other alternatives.

#### 2. Endorsed ANSI Standard

The preparation of an ANSI Standard and the subsequent endorsement of the Standard by a Regulatory Guide would require substantially more time and more effort than the other alternatives. Furthermore, the action involves siting policy considerations of a type usually retained for action by NRC staff directly and not delegated for action by an ANSI standard working group.

#### 3. NUREG

NUREG's are intended to be informational only and cannot contain and present staff positions or legally require conformance.

#### 4. Branch Position

Branch Positions are considered to be temporary measures until a needed action can be accomplished by another, more suitable alternative because of the limited distribution and circulation of Branch Positions. Further, at the February 18, 1977 meeting of the NRC Regulatory Requirements Review Committee, it was decided that the issuance of a Branch Position concerning the proposed action would not be a desirable alternative, because a Branch Position provides no opportunity for public comment.

#### 5. Regulatory Guide

The development of a Regulatory Guide concerning atmospheric dispersion models for potential accident consequence assessments would require less time than either a Regulation or an Endorsed ANSI Standard. A Regulatory Guide would also have a much wider distribution than a Branch Position, and could present recommended procedures in a more detailed manner than that generally expected to be found in a Regulation. The NRC Regulatory Requirements Review Committee has stated that the development and issuance of a Regulatory Guide is the preferred method of accomplishing the proposed action, since this would provide a mechanism for wide technical review and public comments.

#### C. Decision on Method

- The development and issuance of a Regulatory Guide should be the preferred method of accomplishing the proposed action.

### III. Relationship to Other Existing or Proposed Regulations or Policies

The proposed action is considered to be part of the implementation of the requirements set forth in Section 50.34 of 10 CFR Part 50 and Section 100.10 of 10 CFR Part 100 as described under Regulatory Authority above.

It is not expected that backfitting of existing structures, systems and components will be required.

Revisions to Regulatory Guides 1.3, 1.4, 1.23, 1.24, 1.25 and 1.98 would be necessary to refer to the meteorological dispersion models

presented in the proposed Regulatory Guide. In addition, Section 2.3.4 of Regulatory Guide 1.70 - Standard Format and Content of Safety Analysis Reports and of NUREG 75/087-Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, LWR editions, would require revisions. Section 2.3.3 of Regulatory Guide 1.70, as currently being revised (Revision 3), recommends that the applicant provide meteorological data in a form that may be used to implement the proposed change. Regulatory Guide 4.2, Revision 2, presently recommends that such data be provided. Regulatory Guide 1.23 (Safety Guide 23), Onsite Meteorological Programs would require revisions to recommend that hourly meteorological data be provided, in addition to the joint frequency distributions. The most recent draft version of the American Nuclear Society Document ANS-2.5/M179, "Guideline for Determining Meteorological Information at Nuclear Power Sites", which in its present form is acceptable for endorsement by a Regulatory Guide, recommends the collection and evaluation of meteorological data in a form that may be used in the proposed procedure.

The proposed Regulatory Guide addresses several areas that are integral to the overall siting policy and practice revision study currently under review by the Office of Standards Development, in cooperation with NMSS, NRR and RES. These areas are:

1. The proposed methodology would change the meteorological models used in the calculation of the relative atmospheric dispersion ( $x/Q$ ) values used in the 10 CFR Part 100 assessment,
2. The proposed methodology would change the procedure by which the distance to the exclusion area, within a direction sector, is determined,
3. The proposed methodology would change the procedure for selecting the probability of occurrence level of the  $x/Q$  value to be used in the 10 CFR Part 100 assessment,
4. The proposed methodology may make possible the concept of an LPZ distance that varies with direction around the site, and
5. The proposed methodology could make possible the concept of a population center distance that varies according to the directional distribution of population centers about the site.

Of the five areas listed above, only the first is entirely a meteorological procedure. The third may be considered within the realm of meteorological expertise only to the point of ranking the  $x/Q$  values by frequency of occurrence, while the meteorological involvement in the second area would be limited to determining the

expected magnitude of the variation, from year to year, of the wind direction occurrence frequencies within a sector. The last two areas lie outside the meteorological area of responsibility.

#### IV. Summary and Conclusions

A Regulatory Guide on Atmospheric Dispersion Models for Potential Accident Consequence Assessments should be developed. However, before work on such a Guide can proceed, the following issues must be resolved within the Office of Nuclear Reactor Regulation.

1. Is the procedure for determining the percentile level of the  $x/Q$  value to be used in the proposed evaluation, as presented in the Hydrology-Meteorology Branch Position On Accident Meteorology Assessments, the procedure endorsed by NRR or, if not, what is the procedure endorsed by NRR?
2. Is the procedure for mitigating the effects of shifts in prevailing wind directions from year to year (i.e., using the shortest site boundary within a 45 degree sector), as presented by the Hydrology-Meteorology Branch before the Regulatory Requirements Review Committee, the procedure endorsed by NRR or, if not, what is the endorsed procedure?
3. Is the concept of variable low population zone distances with direction about a nuclear plant site and the variability of population center distances with direction, implicit in the proposed procedure, acceptable within NRR?

If the Office of Nuclear Reactor Regulation indicates, by the approval of the Task Initiation for this task, that the procedures and concept above are acceptable, work should proceed on the development of the proposed Regulatory Guide. Otherwise, further development on the Guide should be deferred, pending a resolution of these issues within the Office of Nuclear Reactor Regulation.

No additional technical assistance contract support requirements are anticipated.

*Robert A. Kornasiewicz*  
Robert A. Kornasiewicz  
2/28/77

COMMENTS ON THE ENCLOSURE TO THE SECRETARY'S MLMO  
(8/5/77) FOR MEMORANDUM TO THE EXECUTIVE DIRECTOR  
FOR OPERATIONS

COVER MEMO

1. Page 1

Comment

The statement, "It is apparent that no single set of guidelines can be both versatile and definitive enough to provide detailed instructions....," is undermined in the same paragraph by the statement that no additional internal office guidelines will be "necessary." The former is more realistic and the latter should be replaced by a statement to the effect, "The willingness and ability of staff offices to prepare impact-value assessments will be improved if each major office develops an internal set of instructions to aid them in carrying out the analysis. A file of illustrative examples within the area of concern of each office could also be useful." This change is consistent with the Commissioners' request that program offices develop IVA action plans, consistent with the general NRC-wide guidelines.

The second bullet point emphasizes the subordinate role of impact-value assessment to health, safety, and national security. For example, if a regulatory action reduces the risk of accidents,



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

April 15, 1976

OFFICE OF THE  
CHAIRMAN

MEMORANDUM FOR: Lee V. Gossick  
FROM: William Anders  
SUBJECT: IMPACT VALUE ASSESSMENTS

During its initial year, the Commission has made it clear that not only was NRC to meet its fundamental safety and other statutory mandates, but that we were going to do it more effectively and efficiently.

As you know, an important element of the action program to achieve these goals was the introduction of the use of impact/value assessments in evaluating proposed regulatory actions. Such assessments were to serve to make the consequences of our possible actions more explicit, through concrete measures such as numbers of health effects, or dollars-and-cents, or pages of paperwork, etc. In particular, the Regulatory Requirements Review Committee was to make full use of these assessments to do its job better.

Recently, I was told that nine out of nine recent R<sup>2</sup>C actions were based on impact/value assessments, so I asked to see the backup documents. The assessments in these documents are a good start and I am very appreciative of this. However, I'm sure we all agree that there is room for improvement.

The objective of this process should be to relate expert ideas and judgment through concrete expressions of public benefits and public costs. Only in this way can we assure the public that we are not only protecting their safety and the environment, but we are doing it without unnecessary or counter-productive requirements.

I recognize that it's not an easy task to assure safety. It is even harder to do it efficiently. But that is NRC's task, and — as I know you fully agree — we must continue to find ways to do it better.

- cc: Acting Chairman Rowden
- Commissioner Gilinsky
- Commissioner Mason
- Commissioner Kennedy
- Ben Huberman
- Peter Strauss
- Sam Chalk

Enclosure G

this would show up in the calculation of value. Naturally, protection should err on the conservative side when doubt or uncertainty exists. Thus, the statement should be revised to state "Although impact-value analysis is subordinate to the protection of health, safety, national security, and environmental quality, progress toward reaching the goal can be aided by well-informed use of analytical tools."

Although a relatively minor matter, NRC should settle on one standard name and punctuation: I-V, V-I, V/I, or I/V. Impact value most closely corresponds to cost-benefits and the slash might be confused with a division sign or a numerical ratio.

#### Response

MBO VI, Part A has been amended to include a section which tracks implementation of the value-impact guidelines.

Bullet number two has been revised.

The guidelines now direct that the "value-impact" be the standardized term used agency-wide.

#### 2. Page 2

##### Comment

The first sentence stating, "The NRC staff has been receptive... to the maximum extent possible" appears to conflict with the practice

to date since there has been less utilization of impact-value assessments than would have been desirable. This also applies to the statement on the issuing memorandum that "For the most part, V/I assessment is already an integral part of evaluation." Thus, these sentences should be deleted.

The guidelines should be more specific on the monitoring role to be played by EDO.

Response

Sentences have been deleted.

The revised MBO VI, Part A and the EDO's memo to offices provide more specificity on the EDO's monitoring role.

GUIDELINES SUMMARY

3. Page i

Comment

The introductory paragraph on costs should be revised as follows, to reflect a slight change of emphasis: "Costs are an important factor in regulatory matters so that priorities can be set to direct efforts toward the greatest feasible attainment of these goals."

Response

The paragraph has been revised.



4. Page ii

Comment

Contrary to the statement given, the impact-value assessment or at least its major findings and conclusions should be placed in an explicit, separate, identifiable section. This will promote (1) visibility and (2) allow review of whether a complete analysis has actually been done. The format should promote a comprehensive, well-documented analysis of important variables in a uniform, systematic fashion.

The discussion on the origin of the term, impact-value assessment, goes too far in trying to compensate for possible misperceptions. The draft should be corrected by changing "usually perceived" to "sometimes misperceived," and by replacing "This was felt to be inappropriate for regulatory purposes, ..." with "In fact....".

Response

Page ii has been revised.

5. Page iii

Comment

In the course of an impact value-assessment, the staff should identify a range of alternative objectives except where the objectives are unarguable, defined by statute, or Commission action.

Response

See changes to Page ii.

6. Page vi

Comment

The statement that "It is unlikely that many value-impact analyses will necessitate such detailed discussions" should be removed, to avoid hinting the pro-forma, sketchy treatment will suffice. Instead, examples illustrating the length and depth of the assessments, indicating man-hours of preparation time would be helpful to office users.

Response

The statement in question has been modified and Appendix II presents a discussion of the resource requirements which can be expected to accompany the implementation of the value-impact guidelines.

GUIDELINES TEXT

7. Page 2

Comment

The draft should indicate that, where uncertainty makes single-number estimates tenuous, the estimation of values for a whole set of scenarios of postulated risk levels can be adopted.

Response

A footnote has been added to Page 2.

8. Page 3.

Comment

Revise the guidelines to emphasize that examples of items that do and do not require impact-value assessments should be identified. It should also be mentioned that a series of "minor" actions may have a large cumulative impact on the public.

Response

Appendix II presents examples of papers which do or don't require value-impact assessments.

A footnote stressing the cumulative impact of "minor" actions has been added.

9. Page 4

Comment

The statement that "ultimately, all policy decisions must involve "judgment" is true, but it gives the impression that analysis is totally subjective. The addition of two more sentences would clarify the reason for assessments: "The whole purpose of the analysis is to explicitly document the value judgments made and force recognition of implicit assumptions. This then allows the analyst, decision-maker, or member of the public to scrutinize the assumptions and see

the basis behind the decision." Change the first sentence in the last paragraph to emphasize the need to consider staff resource requirements as well. For example, "Value/Impact Analysis should be conducted for proposed regulatory actions which may impose a burden on the public or Commission staff. This especially applies to effects from a continuing action."

Response

Comments have been accommodated with exception of the reference to burden on Commission staff. Attention is directed to former Chairman Anders' memo (attached to the guidelines). Although staff costs should not be neglected, the intent of requiring value-impact assessments was to minimize any unnecessary burden on licensees and the general public.

10. Page 5

Comment

More guidance should be given on how impact-value assessment can be integrated with other types of analysis (e.g., environmental impact statements).

The general rule that the depth of analysis depends on the anticipated magnitude of impacts and values is not disputed. However, the scope and depth of the assessments could be clarified by more specific guidance or examples so that the process does not become burdensome or superficial.

Response

Text states that a separate value-impact statement, which summarizes alternatives, should accompany the cover memo when an environmental impact statement is sent to the Commission.

11. Page 7

Comment

The guidelines could also state the usefulness of attaching a range of probabilities to the accidents, besides showing a range of man-rem doses, if sufficient information is available.

Response

See response No. 7.

12. Page 17

Comment

The guidelines mention the omission of sunk costs and the need to analyze marginal quantities, but the reasons why are not explained thoroughly enough for non-economists to understand. Some further explanation would be helpful.

Response

Discussion on Page 17 has been expanded.

13. Page 19

Comment

The discussion of private sector costs should distinguish between real resource costs and changes in the distribution of wealth. It should also provide more guidance on what costs are to be included and how they are to be weighted.

Response

[First comment yet to be accommodated.]

It is not recommended that costs be weighted since such a practice would introduce additional subjectivity into the analysis.

14. Page 23

Comment

More emphasis should be placed on sensitivity analysis and parameter testing. A single number derived from a narrow set of restrictive assumptions may be less useful than a range of reasonable figures.

Response

See response No. 7.

15. Page 24

Comment

Non-economists unfamiliar with the concept may need more of an explanation of the rationale for discounting and the choice of an appropriate rate.

The current edition of Grant's book was co-written with Ireson and Leavenworth.

Response

There is no agreement among economists regarding the appropriate rate. Therefore, it is recommended that analysts follow OMB's directive which at least will allow for consistency government-wide. OMB Circular A-94 directs that a 10% discount rate must be used and that one higher and one lower rate be included in analyzing deferred costs and benefits.

Citation for Grant's book has been changed.

16. Page 25

Comment

To limit the possibility of confusion in the handling of inflation, it would be helpful to define criteria for deciding when inflation factors should be included. The following points need to be considered: Pure monetary inflation, where prices and wages rise uniformly, should not be factored in. Resources whose prices are rising faster than the general rate of inflation can be included under certain circumstances. The numbers of both benefits and costs inflate over time. The use of nominal dollars which are not deflated to a common year's dollars is misleading. In addition, one treads a fine line in estimating these rates. It should be noted that high inflation rates have not been the predominant historical trend over the long run.

Response

Based upon a review of value-impact analyses conducted over the past year, very few will require that future inflation rates be

addressed. The guidelines now contain a reference for a more detailed discussion of incorporating anticipated inflation into an analysis.

17. Page 26

Comment

A more detailed bibliography, separated by topics, would be helpful.

Response

The bibliography now contains annotation.

18. Appendix I

Comment

The definitions of benefit and cost on this page [p.3] are circular and should be deleted. Also, the last paragraph on page 3 and the first sentence on page 4 should be deleted because they do not add new information to an understanding of impact-value assessment and are, in a few instances, self-contradictory.

Response

Definitions are believed to be correct although they may appear to be circular. Costs and benefits as generally estimated are mirror images of each other and it is often arbitrary whether an impact is categorized as one or the other. For example, suppose that





ORGANIZATION

COMMISSION STAFF

STAFF

DATE

OCTOBER 1, 1977

ENCLOSURE C

GOAL

C - IMPROVE THE EFFECTIVENESS AND EFFICIENCY OF NRC MANAGEMENT

OBJECTIVE

B - IMPLEMENT SELECTED PROGRAMS TO IMPROVE THE QUALITY AND EFFICIENCY OF NRC MANAGEMENT AND DECISION MAKING

LEAD OFFICE . . . PLA

MILESTONES

C - MAKE RECOMMENDATION ON COMPOSITION OF V-I STATEMENTS AND REVISION OF GUIDELINES (PLA)

FY 1977												FY 1978												FY 1979											
O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S

←

LEAD STAFF ASSIGNED

J. SULLIVAN



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

Item # 5

MAY 1 1979

MEMORANDUM FOR: Norman M. Haller, Director  
Office of Management & Program Analysis

FROM: Martin G. Malsch  
Chief Regulations Counsel  
Office of the Executive Legal Director

SUBJECT: REVIEW OF AGENCY-WIDE VALUE-IMPACT GUIDELINES

OELD has only one comment on the existing guidelines for conducting value-impact analysis. The guidelines provide that cost considerations may not take precedence over considerations of health, safety, environment, or national security, and imply that cost considerations are relevant only in choosing among alternative means in realizing equivalent benefits in regulatory matters. The Commission itself needs to address whether cost considerations may play a role in health, safety, and national security issues. The present guidelines provide for only limited consideration of cost in this context, and there has been considerable debate as to whether the Commission could or should broaden the role of cost considerations in this regard. The guidelines could be made more explicit on this point and/or public comment could be focused on this matter. Also, the limited role provided for cost considerations in making environmental decisions is not entirely consistent with the Commission's interpretation of NEPA. NEPA clearly contemplates that cost could be the deciding factor in some instances.

A handwritten signature in cursive script, appearing to read "Martin G. Malsch".

Martin G. Malsch  
Chief Regulations Counsel  
Office of the Executive  
Legal Director



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

Item # 6

MAR 07 1979

MEMORANDUM FOR: Norman M. Haller, Director  
Office of Management and Program Analysis

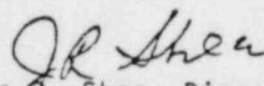
FROM: James R. Shea, Director  
Office of International Programs

SUBJECT: REVIEW OF AGENCY-WIDE VALUE-IMPACT GUIDELINES

In response to your memorandum of February 16, IP concurs in general in the draft Value-Impact Guidelines. Also, there are no office-specific value-impact guidelines in use by IP.

Since the majority of IP's Commission papers involve export license requests or other matters which do not require a value-impact statement, I recommend that there be no requirement to explain the lack of a value-impact statement repetitively in each IP Commission paper. Accordingly, the first paragraph on page iii of the guidelines should be modified as follows:

All Commission papers classified as either "Commission Action Items", "Policy Session Items", or "Consent Calendar Items" should be accompanied by a value-impact statement or an explanation of the reasons for not including a statement, unless the action involved is non-regulatory (e.g., paper recommends that the Chairman sign a letter to a Congressman) or the regulatory action is "routine" or recurring in nature (e.g. approval of an export license for low-enriched uranium).

  
James R. Shea, Director  
Office of International Programs



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

Item # 7

MAR 07 1979


MEMORANDUM FOR: Norman M. Haller, Director  
Office of Management and Program Analysis

FROM: Dudley Thompson, Executive Officer for  
Operations Support  
Office of Inspection and Enforcement

SUBJECT: REVIEW OF AGENCY-WIDE VALUE-IMPACT GUIDELINES

In response to your memorandum dated February 16, 1979, subject as above, we gave IE staff members the opportunity to comment on Commissioner Bradford's question of whether the need to conduct value-impact assessments has discouraged the development of new regulatory requirements. All respondents reported that they had noted no instances where this requirement had discouraged development of regulatory requirements. One Headquarters Division reported that the requirement for value-impact assessments has resulted in more time being needed to initiate new regulations and Regulatory Guides.

We have no comments on the Guidelines for Conducting Value-Impact Analysis.

  
Dudley Thompson  
Executive Officer for  
Operations Support  
Office of Inspection  
and Enforcement

cc: N. C. Moseley  
H. D. Thornburg  
E. M. Howard  
J. H. Sniezek  
B. H. Grier, RI  
J. P. O'Reilly, RII  
J. G. Keppler, RIII  
K. V. Seyfrit, RIV  
R. H. Engelken, RV



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

Item # 8

MAR 8 1979

MEMORANDUM FOR: Norman M. Haller, Director  
Office of Management and Program Analysis

THRU: *[Signature]* Daniel J. Donoghue, Director  
Office of Administration

FROM: J. M. Felton, Director  
Division of Rules and Records, ADM

SUBJECT: REVIEW OF AGENCY-WIDE VALUE-IMPACT GUIDELINES

The Office of Administration has no specific comments on the "Guidelines for Conducting Value-Impact Analysis" attached to your memorandum of February 16, 1979. We do, however, offer the following general comments:

We suggest that the Federal Register notice, which will request comments on Guidelines, reference Executive Order 12044 and note that NRC is developing criteria for determining when a "regulatory analysis" will be prepared. The notice should also indicate that these criteria may be somewhat different than the criteria contained in the Guidelines for determining when a value/impact statement will be prepared.

With respect to your question concerning office-specific-guidelines, the Office of Administration does not have office-specific guidelines for conducting value-impact analyses. We have, however, developed "Guidelines for the Preparation of Report Justification Analyses" covering reporting requirements subject to the Federal Reports Act (copy enclosed). These guidelines contain much of the information contained in the value impact guidelines, but were adopted specifically to meet GAO's requirements in 4 CFR Part 10. We have no objection to making these guidelines available for public comment.

We are not aware of any instance where the preparation of value-impact analysis has resulted in the abandonment of a proposed regulation, although it may have led to the imposition of less costly alternatives. We are also not aware of any instance where the requirement for the preparation of a value/impact analysis has discouraged regulatory initiatives on necessary health and safety issues.

*[Signature]*  
J. M. Felton, Director  
Division of Rules and Records  
Office of Administration

Enclosure: As stated

GUIDELINES FOR THE PREPARATION OF REPORT JUSTIFICATION ANALYSES  
FOR THE COLLECTION OF INFORMATION SUBJECT TO GAO CLEARANCE

The following guidelines are provided to assist offices in the preparation of report justification analyses for initiating or continuing NRC requirements for the collection of information (hereinafter referred to as reporting requirements) subject to GAO clearance. The analysis should demonstrate (a) the NRC's need for the report (b) the cost to respondents and the NRC of preparing the report and utilizing the data, (c) the alternatives considered, (d) an assessment of the value/impact to respondents and the NRC, and (e) a statement of those persons consulted in the development of the requirement and the value/impact analyses data.

I. NEW REPORTING REQUIREMENTS

A. Need for the Report

It must be established that the information to be reported is necessary for the conduct of the NRC regulatory program, and not merely useful or interesting. It is also necessary to demonstrate how the information will be used to serve a regulatory need. Among the items to be discussed are:

1. The health, safety, environmental, security, legal or administrative requirements necessitating data collection.
2. How and by whom the information will be used.
3. How the information to be reported will meet the above needs.
4. What the impact would be of not obtaining the information.

B. Cost or Burden to Respondents and NRC

It is necessary to determine the costs or burden to respondents imposed as a result of the reporting requirement, and the costs to the NRC in

analyzing or otherwise utilizing the data. Such costs should be considered both in terms of dollar costs and manpower costs. In general, this may be done in terms of costs to the average respondent; however, where there is expected to be a wide range in the anticipated costs to respondents, the limits of the range should also be indicated. In determining the real costs or the burden of the reporting requirement upon respondents, GAO encourages the use of pretests or surveys. Among the items to be considered are:

1. The methodology utilized in the analysis of costs:
  - (a) How were the costs determined?
  - (b) Who determined costs?
  - (c) What assumptions were made in performing the cost analyses?
2. The cost analysis should include, where applicable, estimates of cost to:
  - (a) The licensee.
  - (b) The industry.
  - (c) Agreement States.
  - (d) The NRC.
  - (e) Other elements of Federal, State and local governments.
3. Costs to Licensee and to NRC should include:
  - (a) Cost of collection/compilation.
  - (b) Cost of analysis.
  - (c) Cost of reproduction/distribution.
  - (d) Cost of storage/retention.
4. Were respondents consulted as to estimated costs, and were pretests or surveys utilized?



5. Will the respondent incur costs in developing the information or is the information already available in the respondent's files?
6. Has the total respondent universe been identified? What is the total cost to affected respondents (average costs x respondent universe)?
7. Are the cost estimates consistent with historical data and cost trends for similar data requirements?
8. Considering that small business enterprises may have limited staff and resources, discuss the ability of respondents to develop the data and to bear the costs associated with the reporting requirements.

C. Identify and Evaluate Alternative Data Sources and Other Alternatives Considered

In recommending the proposed reporting requirement in its present form, various alternatives must have been considered. This section is to collect information concerning the alternative sources of data considered and the alternatives considered to make the reporting requirement less burdensome upon respondents.

1. Alternative Data Sources.

(a) Method of search for alternative data sources should be described. Analysis may encompass data from:

- (1) NRC
- (2) Open literature
- (3) Other government agencies (Federal, State and local).
- (4) Review of licensee files.
- (5) Industry sources

(b) Any overlap or duplication of the proposed reporting requirement with other NRC reporting requirements should be identified.

(c) The search for alternative data sources may result in one or more of the following conclusions which should be discussed:

- (1) No alternative data source exists?
- (2) Source exists for part of data required?
- (3) Source exists for complete data requirement?

(d) The rationale should be provided for rejecting alternative sources, such as:

- (1) High cost of obtaining or reconfiguring data?
- (2) Lack of timeliness of data?
- (3) Lack of quality of data.
- (4) Lack of availability of data?
- (5) Incompleteness of data?

## 2. Other Alternatives Considered

(a) Would a one-time survey be adequate for NRC's regulatory need?

(b) Would sampling and spot checking suffice for regulatory need?

(c) Was feasibility of reducing the number or types of respondents subject to reporting requirements considered?

(d) Would less detailed information be sufficient?

(e) Can the frequency of reporting be reduced?

(f) Would alternate methods of information collection meet the regulatory need with less burden on the respondents?

- (g) Could standardized reporting form or coded data element responses be used rather than narrative type responses?
- (h) Would extrapolation from known data suffice?
- (i) Describe any other alternatives considered to make the reporting requirement less burdensome upon respondents or to reduce the number or type of respondents subject to the reporting requirement.

D. Value/Impact Assessment

This section is designed to assess the value of the reporting requirement in relation to its burden upon respondents and the needs of the regulatory program.

1. Any benefit resulting from NRC receipt of this information which accrues to the following groups should be identified:
  - (a) Licensees
  - (b) Industry
  - (c) Agreement States
  - (d) NRC
  - (e) Other government agencies
  - (f) The public
2. Where possible, benefits should be quantified and a common unit of measure developed.
3. Qualitative benefits should be identified and described in detail.
4. Total value derived from imposing the reporting requirement should be determined on an annual basis.
5. Impacts, other than direct costs, should be identified, and where

possible, quantified.

6. Total impact, including cost, should be determined.
7. Total impact should be compared with total value.
8. A value/impact comparison should also be made between the proposed reporting requirement and the major alternatives considered.

E. Consultations Outside the NRC

This section should discuss consultations with other Federal, State or local agencies and with respondents to demonstrate that available sources of information have been considered and that the cost estimates are realistic.

1. Who was consulted?
2. Did consultations include a representative cross-section of agencies and respondents?
3. Discuss any unresolved problems following such consultations.
4. Discuss the extent to which comments of those consulted are reflected in the reporting requirement.
5. Did licensees have actual notice of the proposed reporting requirement or did the NRC limit notice to publication in the Federal Register.

## II. RENEWAL OF GAO CLEARANCE ON EXISTING REPORTING REQUIREMENTS

A reports justification analysis for the renewal of a prior GAO clearance which is about to expire must be prepared in accordance with the requirements for new reporting requirements as set forth in Part I. To the extent that the data is still current, information previously prepared may be incorporated by reference. Costs should be updated.

The following information also should be furnished:

- a. A statement detailing the specific use that was actually made of previously collected information.
- b. Copies of any reports or other analyses prepared as a result of the reporting requirement should be appended to or referenced in the value/impact appraisal.
- c. A statement explaining the circumstances which make continued use of the reporting requirement necessary.
- d. If a change is to be made in an existing reporting requirement, a statement should also be furnished explaining the extent of the revisions and the reasons therefor.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

Item # 9

MAR 6 1979

MEMORANDUM FOR: Norman M. Haller, Director  
Office of Management and Program Analysis

FROM: Learned W. Barry  
Controller

SUBJECT: REVIEW OF AGENCY-WIDE VALUE-IMPACT GUIDELINES

I appreciate the opportunity to review the Value-Impact Guidelines as requested in your February 16, 1979 memo. The Controller's office does not currently have any specific value-impact guidelines to be published for public comment.

It is expected that shortly OMB Circular A-76 will be issued prescribing the Government's policy for distributing work between the Government and the private sector. Cost analysis will be an integral part of this decision. As a supplement to the Circular, a Cost Comparison Handbook will be issued which explains in detail how cost comparisons are to be completed. This Handbook could be a valuable aid in completing the value-impact analysis. You may want to consider checking the value-impact analysis for compatibility with the methodology presented in the OMB Handbook. Also, the Handbook could make a useful addition to your reference list.

Enclosed are the latest drafts of the Circular and Handbook. When they are finalized, we will forward a copy.

  
Learned W. Barry  
Controller

Enclosures:  
As stated



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20565

Item # 10

MAR 20 1979

MEMORANDUM FOR: Norman M. Haller, Director  
Office of Management and Program Analysis

FROM: R. S. Brown, Jr., Assistant to  
the Director and Chief,  
Program Support Branch, NMSS

SUBJECT: REVIEW OF AGENCY-WIDE VALUE-IMPACT GUIDELINES

The Office of Nuclear Material Safety and Safeguards has reviewed your request for information concerning the agency-wide value-impact guidelines sent to us on February 16, 1979.

The NMSS staff:

1. Has reviewed and commented on the agency-wide value-impact guidelines as a prelude to publishing them in the Federal Register;
2. Has reviewed the NMSS office level guidelines to determine if they should be made available for public comment; and
3. Has been given the opportunity to provide written comments on whether the guidelines had in any way discouraged the development of new regulations.

Concerning the first item, the staff had many comments. The following highlights these comments. Attached are all comments received from divisions, branches, sections, and individual staff members as requested.

- . The term "value-impact" was conceived by the Commission and only NRC uses this terminology. All other Federal agencies use the term "cost-effectiveness" for this type of analysis. Terms are important. The explanation of the differences in the guidelines is purely semantic and is more on an academic basis than operational.
- . Nowhere in the guidelines is there any discussion of the problem formulation stage, which is the first and most important step of a cost-effectiveness analysis or a value-impact analysis.

- . At present the value-impact analysis must be completed by the time a regulatory action is made available for public comment. This does not mean that it was prepared in time for use by a "decision maker". Arguments can be made that they are prepared too late in the process, and thus their utility can be questioned.
- . The circumstances when a value-impact analysis should be prepared are too broad. Everything NRC does is a burden on some segment of society. Yet, many of our regulatory actions would be considered only a minor burden on anyone. The guidelines might specify that value-impact analysis would be undertaken only when the decision maker (e.g., Director-level of staff or the Commission) judged that the cost of error in choosing the wrong alternative is deemed to be significantly greater than the cost of the analysis. The threshold criteria would include consideration of both adverse health and safety consequences and economic impacts. The guidelines also might include some quantitative criteria as to how both the economic and health and safety criteria should be evaluated in making this determination. This decision of course would be formally documented with narrative as to why a value-impact analysis was or was not required.

In addition, it should be realized that Regulatory Guides are not substitutes for regulations and compliance with them is not required. On this basis, one can question why a value-impact analysis should be done on them in the first place.

- . The guidelines indicate that value-impact analysis should be complementary to the more inclusive pro/con discussion usually contained in staff papers. If the value-impact analysis is to assist the decision maker in identifying a preferred choice among possible alternatives, the analysis should address the pros (values) and cons (impacts) in some detail. Thus, it would seem the value-impact analysis should be more inclusive than the pro/con discussion in staff papers. The pro/con discussion should, therefore, be mostly extracted from the value-impact analysis.
- . More detailed guidance is needed on how to prepare value-impact statements and analyses and what to include. The guidance should be applicable to an office on an operational level, instead of the present theoretical or academic tone.
- . The need for a value-impact analysis on Branch Technical Positions (BTP's) is questioned. BTP's are only informal technical guidelines which serve a useful purpose in conveying the branch's technical opinion on a certain technical subject. Although they may address policy issues, they represent only branch-level viewpoints, are unenforceable, and enjoy a usefulness largely due to their ease of formulation. We do not use BTP's in lieu of Regulatory Guides and Regulations. Many BTP's eventually become Regulatory Guides. Requiring value-impact analyses on Branch Positions fully negates their utility.



Many of these comments were previously provided to your office during the developmental stages of the guidelines. Since you are considering publishing the guidelines in the Federal Register, we hope you seriously consider these comments. We believe our comments are typical of what you will receive from the public.

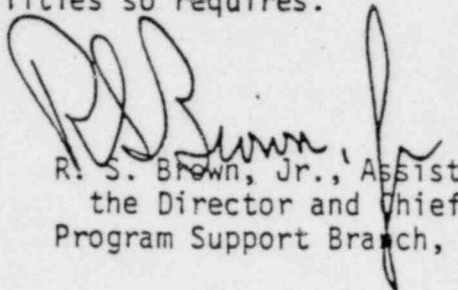
Regarding item 2, after the guidelines were approved by the Commission in the first quarter of 1978, NMSS issued a policy and procedures letter (number 1-9) implementing the guidelines as required by the MBO plan, (attachment 2). This implementation letter is based on the value-impact guidelines as approved. However, as remarked above, we have many concerns regarding the guidelines. The same concerns are manifested in the implementation documentation.

Therefore, we have serious reservations about publishing the individual offices implementation documentation with the guidelines in the Federal Register. In addition, since different offices utilized different implementation procedures for the guidelines, the potential confusion that may arise due to publishing all of the offices implementation documentation should be considered.

Concerning item 3, NMSS has provided each professional staff member the opportunity to submit written comments on whether the guidelines had in any way discouraged the development of new regulations. There has been one proposed rule that may have been affected by this requirement. The proposed Transient Shipment Rule was to be sent to the Commission for their approval on January 15, 1979. This did not occur. One possible reason for the delay was the concern of both ELD and MPA in November 1978 concerning the adequacy of the value-impact analysis. The concern centered around whether the scope of the alternatives analyzed would be judged adequate. The alternatives had been constrained as a result of previous decisions of the Commission on the subject. Regardless of that fact, both ELD and MPA believed that all significant alternative approaches to the transient shipment problem must be addressed if the value-impact analysis were to be considered adequate.

✓ The associated effect is that if any rule is important enough and the promulgation of the rule is delayed by an administrative action, this may lead to a higher use of immediately effective regulations and orders if the public health and safety, the environment, or the safeguardability of nuclear materials and facilities so requires.

In summary, it is suggested that the guidelines be modified to provide additional clarification on the issues discussed in this memorandum before they are published in the Federal Register for public comment. NMSS feels that the office's implementation documentation is only as good as the guidelines and should not be published until appropriate changes are made in the guidelines and the documentation conformed. Experience so far with the guidelines has not discouraged the initiation of new regulations but may be affecting the promulgating of new regulations and the timeliness of making new regulations effective. This may lead to a higher use of immediately effective regulations and orders if the public health and safety, the environment, or the safeguardability of nuclear materials and facilities so requires.



R. S. Brown, Jr., Assistant to  
the Director and Chief,  
Program Support Branch, NMSS

Enclosures:  
As stated



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

Item # 11

MAR 12 1979

MEMORANDUM FOR: Richard E. Cunningham, Director  
Division of Fuel Cycle and  
Material Safety, NMSS

FROM: Robert F. Burnett, Director  
Division of Safeguards, NMSS

SUBJECT: REVIEW OF AGENCY WIDE VALUE-IMPACT GUIDELINES  
AS REQUESTED IN THE HALLER MEMORANDUM OF FEBRUARY 16,  
1979

This memorandum presents the Division of Safeguards' comments on the above-cited Haller memorandum. In addition, we have included individual staff comments for your consideration (attachment 1).

A. AGENCY-WIDE VALUE-IMPACT GUIDELINES

The term "value-impact" was conceived by the Commission. Only NRC uses this terminology. All other Federal agencies use the term "cost-effectiveness" for this type of analysis. Therefore, definitions are very important. If terms are improperly used, there will be great difficulty sorting out exactly what is meant. From this point of view, it would have been preferable to have used the term "cost-effectiveness" in the guidelines since books and numerous studies using this approach would have been available to the staff. However, we realize that the Commission has possibly "institutionalized" the term "value-impact." As a result it may be very difficult, if not impossible, at this time to change guideline terms.

The guidelines should be more explicit in defining "value-impact" before it is published in the Federal Register. The definition that Professor Michael S. Baram uses for "cost-benefit" analysis,

"An analytic study designed to assist a decision-maker in identifying a preferred choice among possible alternatives."\*

\* Michael S. Baram. "Cost-Benefit Analysis in Energy Decision-Making of the Nuclear Regulatory Commission," September 7, 1978, p. 11.

is a better description of "value-impact" than is presented in the guidelines.\* In addition to defining "value-impact" in a very broad sense, this definition has the advantage of identifying the purpose for which the analysis has been undertaken.

The guidelines, as written, do not provide either an adequate definition or sufficient discussion as to its purpose or use within the Commission. The purpose should be discussed in sufficient detail so that both the staff and the public can understand what the Commission envisioned for this analytical approach. The above definition would at least indicate that the basic purpose for the analysis is to assist a decision-maker.

Once the purpose of value-impact analysis has been clarified, a number of related topics should possibly be addressed in the guidelines.

### Problem Formulation

Cost-effectiveness type analysis starts when a decision-maker has a major problem. Nowhere in the Guidelines is there any discussion of the problem formulation stage, which is the most important step of analysis. If there is no problem then it would appear that the decision-maker does not need a value-impact analysis. It is suggested that the guidelines provide a section discussing problem formulation and its potential impact if the wrong problem is addressed in the analysis.

### Completion Date for a Value-Impact Analysis

At present the value-impact analysis must be completed by the time a proposed regulatory action is made available for public comment. This does not mean that it was prepared in time for use by a "decision-maker." Executive Order 12044 on "Improving Government Regulations" was explicit as to when this type of analysis should be completed. It specified that "...the requirements for an analysis of alternative approaches [be undertaken] early in the decision-making process."

The staff as well as the public should understand the desires of the Commission on this point. If the completion date is early in the

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\* We disagree with Baram's definition of "cost-benefit" from a technical terminology sense. However, it is a definition that has been used by some Courts in their determination of adequacy for Environmental Impact Statements.

decision-making process there should be more opportunity for a "decision-maker" to make use of the analysis and the guidelines should encourage the staff to act accordingly. However, if the Commission decides to modify the guidelines to conform to Executive Order 12044 it may result in additional time being required for the development of the new regulations, etc., subject to prior completion of the value-impact analysis. Regardless, the Commission should clarify its position regarding the timely completion of value-impact analyses.

#### Circumstances When a Value-Impact Analysis Should Be Prepared

The guidelines state that,

"Value-impact analysis should be prepared for any proposed "non-routine," non-recurring regulatory action which might impose a burden on the public (where the term public is defined in its broadest sense)." [page 5]

This guidance appears to have been interpreted in such a manner that every non-routine, non-recurring regulatory action the NRC takes must have a value-impact analysis. Everything NRC does has an effect of being a burden on some segment of society. Yet many of the regulatory actions would be considered only a minor burden on anyone. For example, the Division of Safeguards anticipates preparing approximately 100 new Regulatory Guides for the Material Control and Accounting Upgrade Rule. Many of these will have only minor impact on industry or the public. Based on the guidelines, however, each of the 100 proposed MC&A Guidance Documents will require a "value-impact" analysis.

The guidelines might specify that value-impact analysis would be undertaken only when the decision-maker (e.g., Director-level of staff or the Commission) judged that the cost of error in choosing the wrong alternative is deemed by them to be significantly greater than the cost of the analysis. The criteria used would include consideration of both adverse health and safety consequences and economic impacts. The guidelines also might include some quantitative criteria as to how both the economic and health and safety criteria should be evaluated. This decision of course would be formally documented with narrative as to why or why not a value-impact analysis was required.

When a value-impact analysis was not undertaken, the Director or the Commission could reconsider the need for preparing one after all public

comments had been received on the proposed regulatory action. It would appear that this approach would significantly reduce the number of value-impact analyses associated with relatively minor guidance documents.

As an illustration, the Transient Shipment Rule discussed in Section C probably would not have been prepared using the above criteria. The problem is significant and was recognized as such by both staff and the Commission. Yet it probably would have been judged that the error of choosing the wrong alternative from those presented in the Commission paper were considerably smaller than the cost of any value-impact analysis.

### Relationship of Value-Impact Analysis to Staff Papers

The guidelines indicate that value-impact analysis should be complementary to the more inclusive pro/con discussion usually contained in staff papers. [page 4] The guidelines are confusing on this point. If value-impact is to assist the decision-maker in identifying a preferred choice among possible alternatives, the analysis should address the pros (values) and cons (impacts). This appears to lead to unnecessary duplication. On the other hand if value-impact analysis is considered as supporting back-up material to what is described in the guidelines as a more inclusive staff paper this should be addressed in more detail in the guidelines.

### B. NMSS VALUE-IMPACT GUIDELINES

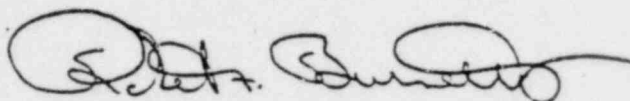
We would not oppose inclusion of the NMSS policy and procedures letter (number 1-9) implementing the agency-wide guidelines in the Federal Register notice. However, we believe since different offices utilized different implementation procedures for the guidelines, the potential confusion of publishing of all the offices' implementation documentation should be considered before such publication is authorized.

### C. DISCOURAGEMENT OF NEW REGULATIONS

There has been only one new Division of Safeguards regulation initiated since the value-impact guidelines became effective. The proposed Transient Shipment Rule was to be sent to the Commission for their

approval on January 15, 1979. This did not occur. One possible reason for the delay was the concern of both ELD and MPA in November 1978 concerning the adequacy of the value-impact analysis. The concern centered around whether the scope of the alternatives analyzed would be judged adequate. The alternatives had been constrained as a result of previous decisions of the Commission on the subject. Regardless of that fact, both ELD and MPA believed that all significant alternative approaches to the transient shipment problem must be addressed if the value-impact analysis were to be considered adequate.

In summary, it is suggested that the guidelines be modified to provide additional clarification on the issues discussed in this memorandum before it is published in the Federal Register for public comment.



Robert F. Burnett, Director  
Division of Safeguards, NMSS

Enclosures:  
As stated



MAR 01 1979

MEMORANDUM FOR: Llewellyn J. Evans, Jr., Chief  
Regulatory Improvements Branch

FROM: Eugene Perchonok, Chief  
Technical Planning & Information Branch

SUBJECT: REVIEW OF AGENCY-WIDE VALUE-IMPACT GUIDELINE

Prior to the publication of the draft paper "Guidelines For Conducting Value-Impact Analysis," by OMPA, there did not exist a government or academic definition of Value-Impact Analysis. The OMPA paper attempts to define this type of analysis but actually describes what is known as Cost-Effectiveness Analysis. Unfortunately, the OMPA paper does not clearly describe all of the elements of this type of analysis so that it is difficult to apply the OMPA Guidelines to real world problems. In addition, the examples portrayed by OMPA are so vague and general that they do not provide useful guidance to the individual performing the analysis.

I suggest that OMPA either publish guidance to the staff on the use of cost-effectiveness analysis or provide a concrete definition of value-impact analysis together with more useful examples for the benefit of the staff.

A handwritten signature in cursive script, appearing to read "Eugene P.", written in dark ink.

Eugene Perchonok, Chief  
Technical Planning and  
Information Branch





This memorandum presents my personal views on NRC's agency-wide Value-Impact Guidelines. As will become evident, only a portion of the discussion below would be appropriate as part of the response from our division or office to the Haller memorandum, dated February 16, 1979, on this subject. The comments in this memorandum are based on my professional judgment. Before the Guidelines are published in the Federal Register, I believe I have a responsibility to my management to identify my concerns with value-impact analysis.

As you know I have been troubled with what I consider lack of proper "guidance" in the Guidelines since reading it for the first time upon returning from my ten-month resident study at the Industrial College of the Armed Forces. At first I thought I knew what "value-impact" analysis was all about within NRC. It appeared from reading some of the material used in the Guidelines that "value-impact" was just NRC's new term for cost-effectiveness analysis. Unfortunately, the more I read value-impact analyses sent to the Commission, the more confused I became.

As background, a major portion of my professional career over the past sixteen years has been managing, undertaking and reviewing cost-effectiveness studies on both military and civilian problems. In this capacity I have worked for The RAND Corporation, Research Analysis Corporation, Georgetown University and the National Science Foundation before joining the Nuclear Regulatory Commission. In addition, I co-authored the "Guide For Reviewers of Studies Containing Cost-Effectiveness Analysis" which General Abrams, then the Vice Chief of Staff of the Army, requested maximum dissemination and use be made of throughout the Army.

Approximately a quarter of the authors of the books cited in the Reference Section of the Guidelines I have known personally and I have worked directly for two of them.

As will become evident in the discussion below, my professional background has not permitted me to fully understand either the purpose or use of the NRC's value-impact analysis.

Presented below are specific comments on the Guidelines.

1. What is the Value of NRC's Value-Impact Analysis Approach?

Do the majority of staff Commission papers provide adequate value-impact analysis? Based on what I have seen, I seriously question their worth to either the Commission or the public. If I am correct, either the agency-wide Guidelines is inadequate or NRC staff and management have chosen to interpret the Guidelines very narrowly and have undertaken the bare minimum level of "analysis" that can not be used to assist the decision-making process.

Yet it appears from the "acceptance" by OMPA, OPE and the approval by the Commission of the recommended actions presented in these studies that value-impact analysis does meet the Commission's needs. If this is the case, then the Guidelines must be adequate and should be published in their present form in the Federal Register.

2. What is the Meaning of the Term "Value-Impact Analysis"?

One of the first notes I wrote when I arrived at NRC in 1975 was "Some Comments on 'Cost-Benefit' and 'Cost-Effectiveness' Analysis." I indicated that the term "cost-benefit" seemed to mean many things to many people within NRC; yet, the use of this term "cost-benefit" has a precise meaning to economists and policy analysts within other Federal agencies.

Definitions are very important. If terms are improperly used, there will be great difficulty sorting out exactly what is meant. The use of the new NRC term "value-impact analysis" has added to this confusion. Why create new terms such as "value-impact analysis", when all other Federal agencies use either the term "cost-benefit" or "cost-effectiveness" analysis depending upon whether the "effectiveness" will or will not be measured in the same units as costs?

If the new term is really "new" in concept and analytical approach then OMPA should indicate in detail why and how it is unique and different from cost-benefit and cost-effectiveness analysis. In

In addition, OMPA should not cite references to books on cost-benefit and cost-effectiveness analysis that may confuse the reader into thinking that value-impact analysis is really cost-effectiveness analysis if it is not.

This confusion over concepts and definitions was even present in the responses to the "Detailed Commissioner Comments on SECY-77-388 Impact-Value Guidelines", to SECY-77-388A, December 19, 1977, as illustrated below (Enclosure B, page 11-12):

Commission Comment

"The definition of benefit and cost on this page [p.3] are circular and should be deleted...."

OPA Response

"Definitions are believed to be correct although they may appear to be circular. Costs and benefits as generally estimated are mirror images of each other and it is often arbitrary whether a consequence is categorized as one or the other. For example, suppose that two "systems" or approaches to a problem were equally effective in accomplishing a particular objective. Suppose that System A (the status quo) had a one-time cost of \$100 and System B had a one-time cost of \$50. The "benefit" of selecting System B (assuming neither system entailed any non-monetary costs) is a cost savings of \$50. Alternatively the cost of remaining with Alternative A is the \$ 50 in "benefits" foregone (i.e., the alternatives which the \$50 could have effected)." [Underlined for emphasis.]

If NRC had been using the term "cost-effectiveness" any book on this subject would have provided OPA staff sufficient information for them to have agreed with the Commission comment. Using "value-impact analysis" and its vagueness must have caused the confusion.

OPA's response would be wrong in terms of either cost-effectiveness or cost-benefit analysis. Costs are not the mirror image of benefits. In the example OPA overlooked the words "equally effective." If both systems are "equally effective in accomplishing a particular objective", using the criteria for selection of least cost System B would be the preferred alternative. On the other hand, if OPA's response to the Commission is methodologically correct for its "value-impact analysis" then there is even a greater need to provide many more examples and narrative in the Guideline and caution the reader that value-impact has no relationship to cost-benefit or cost-effectiveness analysis used by other agencies.

### 3. What is the Purpose of Value-Impact Analysis?

The Guidelines, as written, do not appear to provide sufficient discussion as to its purpose. It does indicate that "a primary purpose of the analysis is to document explicitly any value judgments and assumptions made thereby allowing the Commission, the public and licensees to better understand and evaluate the basis for the recommendation or decision." (p. 4 of Guidelines).

The fuzziness of purpose has caused considerable problems. Should value-impact analysis be directed towards high-level, policy-important regulatory problems or towards lower-level "technical" alternatives?

In other Federal agencies cost-effectiveness analysis is used by high level policy-makers on only those problems where it is judged that the cost of error in choosing the wrong alternative is deemed significantly greater than the cost of the analysis. It is not merely a documentation of value judgments. Instead the purpose is to present information in such a way as to improve the basis for policy-makers to exercise their judgment. Cost-effectiveness and cost-benefit analysis seek to improve decision making. I do not know what value-impact analysis seeks to accomplish.

What high-level NRC policy issue has been addressed through the use of value-impact analysis? Was the analysis used by either senior NRC management or the Commission in arriving at their decision? Personally I know of none.

I do not believe that the Commission envisioned value-impact studies to be merely "window dressing" for the public prepared to support preconceived recommendations. Yet when there is fuzziness as to purpose, analysis usually will be relegated to only a minor supporting role.

I suggest that analysis should assist NRC management and the Commission in making better policy decisions. The best chance for this to happen is to be very specific as to the purpose of value-impact analysis in the Guidelines.

It would be useful to clarify the purpose of value-impact analysis before the Guidelines are published in the Federal Register.

#### 4. When Should A Value-Impact Analysis Be Completed?

When in the regulatory process should a value-impact analysis be completed? At present the analysis must be completed by at least the time a proposed regulatory action is made available for public comment. In a number of cases the value-impact analysis has been prepared after all decisions have been made.

Other Federal agencies in which cost-benefit or cost-effectiveness analysis is used by policy-makers, the alternatives are evaluated and preferred alternatives selected by the decision-makers after the analysis has been completed but before the implementation of a program, regulation or activity has started. This has not been the case as far as I know within NRC.

Yet Executive Order 12044 on "Improving Government Regulations" was explicit as to when this type of analysis should be completed. It specified that "...the requirements for an analysis of alternative approaches [be undertaken] early in the decision making process". The Executive Order went on to state "...analysis can contribute more to the development of more effective regulations if it is done at the time alternative approaches to designing the regulations are being considered."

#### 5. Is There A Problem in Search of Analysis?

Most cost-effectiveness type analysis starts when a policy-maker has a major problem. That is, he is dissatisfied with some aspect of the present state of affairs and wants to make a decision to alter it without being clear as to how to do this. This is the beginning stage of the analysis. There must be a problem. If there is no problem then the decision-maker does not need cost-effectiveness analysis. I would assume that value-impact analysis also would require a "problem" on which to undertake analysis -- not merely starting with "a statement of the objectives of the recommended action."

Nowhere in the Guidelines is there any discussion on problem formulation. Yet based on my experience, defining "what is the real problem" is many times one of the most important aspects of the analysis.

6. Are Guidelines Useful for Cost-Effectiveness Type Analysis?

Cost-effectiveness analysis is an art not a science. To my way of thinking, it is similiar to surgery. Physicians and even laymen can and have performed surgery with little or no training. On simple problems, the untrained "surgeon" can follow guidelines and be very successful. On complex problems it is almost a certain disaster for an untrained "surgeon" to attempt anything. The best and only way to learn complex surgery is through practice and critiques under the supervision of well qualified, experienced surgeons.

A well prepared Guideline may be of assistance on lower level cost-effectiveness type analysis but I do not believe that such Guidelines can assist the staff in performing the more complex type of analysis required within NRC on major policy problems. What usually happens is that mediocre or poor analysis will be produced and justified on the grounds that it met the Guidelines.

What is needed are qualified professionals for this type of analysis. Possibly even more important is an understanding and acceptance by management in using this analysis in the decision making process.



UNITED STATES  
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WASHINGTON, D. C. 20555

Item # 14

Thank you for providing the opportunity to comment on the proposed value-impact guidelines. I am pleased to submit, attached, those comments I consider of most immediate significance to the proposed issuance in response to your request of March 6, 1979, referenced above. The basis for those comments is discussed below.

The express intent of NMSS Policy and Procedures Letter 1-9, dated October 13, 1978 (attached to reference above), is to establish guidelines and procedures for preparing value-impact analysis and statements. This would infer that this issuance is intended as an aid to the implementation of specific or categorical policy decisions made at a higher level than NMSS, i.e., the Commission.

This issuance appears to adopt, as a basis, guidelines promulgated by an EDO memorandum dated March 31, 1978, which was not included in the documents received for review. It is requested that this reference be made available. These comments may be supplemented pending review of that basis. In the absence of evidence to the contrary, it may be assumed that the general comments herein\* are applicable to that issuance, as appropriate.

Please contact me at your convenience if I can be of any further assistance.

---

\* See Comments 1,3,4,5,6,7,9,10 and 11 in the attachment herein.

Enclosure:  
Comments

## Comments

1. Include citations or references to those specific Commission policy decisions which these guidelines and procedures are intended to implement.
  - a) In the absence of key policy decision it is assumed that implementation of these guidelines and procedures is precluded.
2. The last sentence of the fourth paragraph, page 8:

"Whatever the level of initial decision, the analysis may be subject to further scrutiny in response to an appropriate information request."

should be amended to read:

"Whatever the level of decision, both the analysis and the statement should be subject to review and amendment on a continuous basis."
3. Value impact analysis and statements are described as required to be performed for certain regulatory acts. In the sense that regulatory "non-acts" constitute acts, i.e., acts not to regulate, then a proposed regulatory action not in fact acted upon within a prescribed and reasonable time, e.g., six months, should be considered subject to a value impact analysis and statement.



It is suggested that such an analysis be performed at the instance of concerned staff.

4. It is proposed that a further example of a "...non-routine, non-recurring regulatory action..." is a routine or recurring regulatory action subject to an express differing view by the staff.

It is further proposed that a value impact analysis and statement be performed in all such instances.

5. It is suggested that the guidelines account specifically for that point in the procedure where the official value impact analysis and/or statement is issued to the public, in both proposed and final form. Such a provision is useful to the staff in notification of that point in time, in a given case, their continued expression of concern can be distributed to the PDR.
6. The guidelines should specify a procedure for appealing the non-performance of a value impact analysis or statement at the instance of concerned staff. Further, it should provide for both the official resources necessary to instance such an appeal and measures protecting the staff from inhibition or interference in implementing that procedure.

7. It is suggested that value impact analysis and statements be required to account specifically and in detail for the backfitting aspects of all regulatory acts.
8. Section C.1(b), first paragraph, page 2, defines a class of regulatory acts exempt from value impact analysis based upon "previous similar analyses..."

It is suggested that the guidelines include a provision requiring the reconsideration of performing a value impact analysis in that case where previous analyses are superseded by events.

Further, it is suggested that the guidelines require the explicit citation of each and every review on which such a decision is based.

9. It is suggested that value impact analyses and statements be considered intrinsic, i.e., not contrived to be separate and independent of, the regulatory act they address.
10. Supplementary and related to Comment 9, above, all staff should be permitted to comment on value impact statements.
  - a) Value impact statements upon which each concerned member of the NMSS staff is not permitted to comment should be identified definitively and categorically in the proposed guidelines. They should not be withheld, e.g., the staff not notified when such analyses and statements, in fact, exist.

b) Both the value impact analyses and statements should be held available to the staff on request.

11. Obscure euphemisms and terminology which need clarification/definition:

a) "...non-routine, non-recurring..." (p. 2, line 5, 22, and 31).

(suggest: "distinct" supplemented by more examples)

b) "...administrative changes..." (p.2, line 16)

(suggest: "clerical changes")

c) "...an in-depth review..." (p.2, line 26)

(suggest: "searching review")

d) "...facilities..." (p.2, last line)

(suggest: "specific licenses")



UNITED STATES  
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WASHINGTON, D. C. 20555

Item # 15

This memo is in response to your memo of February 28, 1979, subject as above. I would like to comment on the one point which has led to the question, "whether the Guidelines had in any way discouraged the development of new regulations."

The Guidelines state "It is not intended that the value-impact analysis replace the normal pro/con discussions usually contained in staff papers. Such analysis should be complementary to the more inclusive pro/con discussion which may address more subjective items . . ." This certainly indicates that a value-impact analysis is essentially different from a cost-benefit or cost-effectiveness analysis since either of the latter could include the essence of the pro/con discussion mentioned in the quoted passage. The problem is further complicated because the staff will be unable, without clear guidance and a precise definition of value-impact, to distinguish between a pro/con discussion and the value-impact analysis itself.

Due to the NRC approach to analysis, the Guidelines may in some ways discourage the development of new regulations not because of any intrinsic problem with a cost-benefit analysis where any required pro/con discussion would be part of the analysis but rather as a result of the fact that a Value-impact analysis is defined as being only complimentary to a pro/con discussion. The obvious solution is for the NRC to do cost-benefit analysis performed by cost-benefit analyst. The cost-benefit analysis would include the pro/con considerations as a part of the analysis itself if such pro/con considerations are necessary.



UNITED STATES  
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WASHINGTON, D. C. 20555

Item # 16

March 7, 1979

MEMORANDUM FOR: Edmond Tourigny  
Operations and Planning Branch, FC

FROM: Kitty Dragonette  
Low-Level Waste Branch, WM

SUBJECT: REVIEW OF AGENCY-WIDE VALUE IMPACT-GUIDELINES

Waste Management staff submitted no comments to the effect that development of new regulations has been discouraged.

Two staff members commented on the need for more detailed directions and guidance on how to prepare the impact statements and on what to include.

One also noted the additional resources, difficulty, and uncertainty in applying value-impact requirements to the extensive program established to develop a new regulatory framework for licensing high-level waste repositories. See the enclosed edited copy.

Staff also questioned the need to request public comments on guidance provided to staff for preparation of in-house documents. The Guidelines can be made available to the public. Value-impact statements on specific issues would seem more appropriate to publish for comment. The NMSS procedures do not appear to be sufficiently different or specific to warrant publishing for comment.

*Kitty Dragonette*

Kitty Dragonette  
Low-Level Waste Branch  
Division of Waste Management

Enclosure:  
As stated

cc: J. Martin  
M. Bell  
J. Malaro  
R. Scarano  
J. Bunting



UNITED STATES  
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WASHINGTON, D. C. 20555

Item # 17  
APR 26 1979

MEMORANDUM FOR: Norman M. Haller, Director  
Office of Management & Program Analysis

FROM: D. F. Bunch, Director  
Program Support Staff, NRR

SUBJECT: REVIEW OF AGENCY-WIDE VALUE-IMPACT GUIDELINES

Per your memo of February 16, 1979, NRR has reviewed the subject document. In general, it appears to be a thoughtful and thorough treatise on the factors to be considered in conducting a value-impact analysis. There are a number of comments which are not fully addressed in the present draft which deserve additional discussion.

Foremost among these is the need to explicitly state that when the staff has determined that corrective measures are required to restore or achieve a perceived minimum standard of safety, interim measures can and should be instituted pending the development and review of the more thoroughgoing value-impact analysis. (See SECY-79-8 for a discussion of NRR's decision making process and the permitted role of value-impact in that process.)

A second principal comment is that the guidelines contain, in a number of areas, recommendations which could greatly increase the resources spent on value-impact. The avoidance of excessive costs associated with regulation (one of the objectives set forth in the paper) can be frustrated if the level of effort demanded in value-impact analyses is itself excessive (either by requiring too much detail or by the delays associated with overzealous implementation). We trust that the final version will, in the preface, explicitly note that the "rule-of-reason" applies.

For your information and possible use, we are also including a few specific comments that bear on the above points.

A handwritten signature in black ink, appearing to read "D. F. Bunch".

D. F. Bunch, Director  
Program Support Staff, NRR

Enclosure: As stated

1. The top of page 10 implies a policy approach which is not contained in the regulations, namely that a justification for a ratchet is that overall U. S. societal risk increases with the increasing number of reactors in operation. While this argument has been invoked from time to time (See SECY-79-8) it is arguable whether that example is the best one to use in the document.
2. On page 18 it is recommended that if the expected value or cost is high and data are available "more detailed analyses should be attempted". The discussion then goes on to invoke the RSS consequence model as a tool for this purpose.

First, extra resources should not be spent just because data are available and impacts or value may be significant. Rather, the general thrust of the guidance should be to minimize the effort spent on any staff action (or spent by applicants in response to staff's practices), within the obvious constraint that the statement must adequately inform the decision-maker about the options available.

Secondly, cost-benefit analyses performed using the RSS consequence model should be subject to all the guidelines issued by the Commission (the Policy Statement and subsequent directive to the staff should be explicitly cited). Additionally, the RSS consequence model is not a simple analytical tool to use and should be employed only in exceptional cases for value impact purposes (at least until such time as it is substantially improved and a more complete presentation of its' sensitivities are documented and made widely available).

3. There are numerous recommendations calling for discussion of marginal or insignificant factors in the decision-making process (cf. p. 19 calling for a discussion of "all" undesirable consequences associated with each of various alternatives, p. 25 which requires mentioning "insignificant" impacts just to avoid possible charges of incompleteness). These are unnecessary and should be deleted or be made optional.
4. There are numerous instances where recommendations are made to quantify impacts (cf comment 2 above, the admonition to validate or cross-check cost estimates on p.25). There is also a related recommendation to perform two or more analyses where there are disagreements on value or impacts (p.28). With regard to the latter point, there are always disagreements on value and impact; they need not be quantified to appreciate. In fact too much analyses will probably becloud the basic issues to be decided. Some more temperate or qualifying language would be helpful. Without such, it is doubtful that the conclusion on page 37 can be sustained (which is that the new procedures will involve relatively little additional staff work).



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

Item # 18

MAR 14 1979

MEMORANDUM FOR: Norman M. Haller, Director  
Office of Management and Program Analysis

FROM: Robert B. Minogue, Director  
Office of Standards Development

SUBJECT: REVIEW OF AGENCY-WIDE VALUE-IMPACT GUIDELINES

As requested in your memorandum of February 16, 1979, we have reviewed the Agency-wide value-impact guidelines. It is our view that, while the guidelines contain much useful information, the document is too long and contains too much superfluous information to effectively serve its intended function. We recommend that it be shortened considerably and resubmitted to the office directors prior to publication for public comment. In addition to our major comment and recommendation as stated above, we have provided a list of additional comments, in the enclosure, that addresses various specific details of the guidelines.

Your memorandum asked us to respond to Commissioner Bradford's question of "whether staff members feel that (value-impact analysis and statements) serve in any way to discourage regulatory initiative."

Because we were not sure what was intended by the phrase "discourage regulatory initiative," we asked John Sullivan for guidance. John checked with Commissioner Bradford's staff (Hugh Thompson) and advised us that the question could be restated as - do we ever avoid writing a regulation because value-impact analysis is too painful or too big of a job?

While some members of the SD staff have indicated that they find preparation of value-impact statements distasteful, painful, foreboding, etc. for a variety of reasons, we have not identified any instances in SD where regulatory initiative was discouraged (i.e. not undertaken).

Your memorandum also requested our views on whether SD's office-wide value-impact guidelines should be issued for public comment. We believe the SD guidelines should be published.

We will withhold our concurrence in the Agency-wide guidelines until we have had an opportunity to review a revised version of those guidelines.

*Robert B. Minogue*

Robert B. Minogue, Director  
Office of Standards Development

Enclosure: As stated

cc: John Sullivan, MPA



SD COMMENTS ON AGENCY-WIDE  
VALUE-IMPACT GUIDELINES

1. It should be made clear that, in weighing the impact of any activity on NRC resources and thus on the public, public health and safety concerns would not be compromised merely because of the impact on the NRC.
2. The NRC proposed policy statement should be expanded to indicate that value-impact analyses are to be conducted as early as possible in the development of regulatory activities and may be reconsidered at important junctures during the development.
3. While some examples of value-impact statement are included, none pertain to petitions for rulemaking. The CURE petition (PRM 20-10) value-impact statement should be considered for inclusion to provide such an example.
4. The introduction differentiates between the terms "value-impact" and "benefit-cost," but in some parts of the body of the paper the distinction becomes blurred. (For example, the terms "impact" and "cost" were used interchangeably on pages viii and 10.) The distinction is important because the term "value-impact analysis" is intended to be consistently broader in interpretation and include qualitative, quantitative, or semi-quantitative techniques. Another similar situation arises on pages 25-26 where there is a tendency to equate "impact" with "cost." Impact will in many cases include a safety impact, i.e. what would be the effect of implementing a proposed change in one safety system on the performance or reliability of other safety systems. In the case of inerting of containment for example, inerting might have the value of reducing the likelihood of fire or explosion under certain conditions. It would also have the effect of limiting access to the containment which might reduce the capability of inspecting systems and components inside containment, thereby reducing their reliability.
5. Page ii, sixth line of first full paragraph. Add the word "significantly" before revised.
6. Page ii, paragraph 2. This section should clearly explain that value-impact statements prepared in relation to generic environmental statements should make a comparative analysis of the alternatives of a generic statement, a case-by-case statement, and, in some cases, a negative declaration. It should be further clarified that the value-impact statement should be prepared as early as possible in the development of the generic environmental statement.
7. Page iii, paragraph 2. Commission papers developed in response to petitions for rulemaking often recommend denial of the petition addressed. In such a case, the recommended action, denial, has no impact relative to the status quo. However, it would not necessarily be appropriate in such cases to provide a declaration of negative findings in lieu of a value-impact statement. The staff's evaluation of the values and impacts of the petitioned rulemaking and other alternative actions should be stated and made available to the petitioner as well as to the Commission since this evaluation forms the basis for the staff's recommendation of denial.

8. Page iii, paragraph 3. The value-impact analysis should be prepared only to the depth or detail necessary to resolve those uncertainties in the values and impacts which actually bear upon the determination of the preferable course of action.
9. Pages vii and viii. The illustrative value-impact statement is confusing. It should be clarified or deleted.
10. Page 7. The suggestion that value-impact statements be developed for selected national standards should be deleted. Recent meetings indicate ANSI and its affiliated organizations will not require value-impact statements and NRC does not have the resources to pursue it independently. Because NRC prepares value-impact statements for regulatory guides that endorse or reference national standards, a value-impact analysis is, in effect, performed on the contents of those national standards.
11. Pages 9 and 10. The objective used as an example is worded ambiguously. The objective of inerting reactor containment can be interpreted to apply to an individual reactor or to a population of operating reactors. The impact is quite different. If the risk were  $10^{-6}$  at any one reactor, the risk would be  $10^{-4}$  for a population of 100 reactors. Additional costs would be necessary to reduce the risk at any one reactor to  $10^{-8}$  so that the risk would be  $10^{-6}$  for the entire population of reactors.
12. Page 12. Continue last footnote to read as follows:

"It may be desirable to specify first a set of technical alternatives, each perhaps corresponding to a progressively greater degree of safety but at a higher cost. A value-impact analysis of these technical alternatives would lead to a recommended technical alternative; whereupon a set of administrative or procedural alternatives would be specified and analyzed, leading to a recommended procedural alternative as well. Examples of this approach are given in Appendix III, Parts II and IV."
13. Page 16. Insert the following paragraph immediately before subsection 4:

"However, in the case of petitions for rulemaking which may by their nature lead to questions well beyond the actual scope of the petition, consideration should be given to limiting the alternatives to be considered so that the staff effort is responsive to the need for expeditious consideration of the petition on its own merits. In such cases, the alternatives which were specifically excluded from the analysis for this reason should be so identified."

14. Page 18. Again, the emphasis on more detailed analysis where expected value or cost is high is misplaced. Refer to previous comments with reference to page iii. The recommendation for using "Rasmussen's techniques" should be reconsidered in light of the Commission's position on WASH-1400.
15. Pages 25-30. This section in addition to equating "cost" with "impact" also implies a high degree of economic sophistication in the staff and the availability of extensive data, neither of which are correct.
16. Pages 52-57. The section on Value-Impact and Related Concepts should be deleted because it is irrelevant. Also note page 55, last paragraph. Applicants prepare environment reports, not statements.

For changes involving policy questions value-impact analyses may serve a useful purpose in communicating the rationale to upper management or in documenting the thinking behind important changes. However, even some policy issues of a minor importance are resolved at the branch level and do not merit value-impact analysis on the basis of facilitating communications or providing formal documentation.

These considerations would also seem to apply to the requirement that value-impact analyses be prepared for all Branch Technical Positions as stated in the last paragraph of page 3. Branch Technical Positions are only informal technical guidelines which serve a useful purpose in conveying the branch's technical opinion on a certain technical topic. Although they may address policy issues they represent only branch-level viewpoints, are unenforceable, and enjoy a usefulness largely due to their ease of formulation. Requiring value-impact analyses on Branch Positions fully negates their utility.

Of course it may be that value-impacts have some unseen value not recognized in these comments. In that case it is recommended that a thorough value-impact be prepared which addresses the requirements for value-impacts on all types of issues.

Item #20

As a general statement, I do not think we should get into the value-impact analysis game for that is just exactly what it will become. Our job is already difficult enough without placing this additional requirement upon us. I can see the future where questions to our economic/social impact analyses can take up more staff time and effort than the technical problems associated with a licensing action.

Further, this doc. is written for reactors. The licensing of a repository will be an extremely different task and we do not have the types of expertise required to prepare and evaluate the kinds of data needed, nor have we developed this type of expertise within our contractors up to this time.

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Item # 21

The NMSS P & P letter 1-9, Oct. 13, 1978 looks basically good to me. It has not discouraged our writing of regulations.

The only fuzzy part, it seems to me, is in part D 5 page 7, setting up the Criteria or Standards on which the evaluation and recommendations will be based.

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## VALUE-IMPACT ANALYSIS

The following guidelines and procedures are established for preparing value-impact analyses and statements.

### A. Purpose

The purpose of this Letter is to establish procedures within NMSS to ensure the timely and effective preparation of value-impact analyses and statements for any proposed regulatory actions that might impose a significant burden on the public. This Letter supplements the guidelines promulgated by EDO memorandum of March 31, 1978, which should be consulted for further guidance.

### B. Background

Value-impact analysis is a system for comparison of consequences associated with alternative courses of action, and is essentially equivalent to cost-benefit analysis or cost-effectiveness analysis. Value-impact analysis is intended to identify all of the "values" (positive or beneficial consequences, e.g., reductions in radiation doses to the public), and "impacts" (negative consequences, e.g., environmental damage, increased economic costs), associated with any proposed regulatory actions that might impose a significant burden on the public (where the term "public" is defined in its broadest sense), in order to simplify judgments required of the decisionmaker in selecting an optimal course of regulatory action.

The overall guidelines promulgated by the EDO memorandum of March 31, 1978, (distributed to all branches by R. S. Brown memo of April 5, 1978), contain extensive discussion and illustrations of value-impact analyses and statements (hereinafter referred to as "EDO guidelines"). This Letter supplements those guidelines, which should be followed in preparing analyses and statements within NMSS.

C. In what circumstances should a value-impact analysis be conducted?

1. General Requirements

The purpose of the analysis is to provide the decisionmaker with an assessment of the value to be derived from taking a particular non-routine, non-recurring regulatory action and the associated impact of that action on the public.

a. Regulatory action

A "regulatory action" is one which will cause or require an applicant, licensee, or any person, to act or refrain from acting in a specified way, and is primarily associated with the issuance of licenses to receive, manufacture, produce, transfer, own, acquire, possess, or use nuclear mater. Such actions include changes in conditions which prospective licensees must meet and changes in conditions under which existing licensees must operate.

Actions associated with administrative changes are considered non-regulatory. Examples of non-regulatory actions are: reorganization of a program office; development of program plans; responding to congressional inquiries; and reviewing studies conducted by other agencies.

b. "Non-routine, non-recurring"

Certain routine or recurring regulatory actions need not be accompanied by a value-impact analysis. For example, the decision to license a particular commercial facility is preceded by an in-depth review of consequences and alternatives. Such reviews are based upon experience gained from many previous similar analyses, and include the considerations which would otherwise be covered by a separate value-impact analysis.

Rather, it is non-routine, non-recurring regulatory actions which are to be subjected to value-impact analysis. These may be broadly categorized as actions whose impact reaches beyond a specific licensing action, e.g., affecting all facilities of a type or class.



2. GEIS: A special case

Generic environmental impact statements present a special case. The analysis performed under GEIS guidelines contains all elements of a value-impact analysis, although not in the same format (see, e.g., the Final GESMO report). As long as the standard GEIS format is adhered to, no separate value-impact analysis is required. What is required, however, is a value-impact statement contained in a separate section in the transmittal letter to the Commission, briefly summarizing the value-impact elements contained in the GEIS analysis.

Illustrative value-impact analyses and value-impact statements are contained in the EDO guidelines.

3. Threshold of Significance for Impacts

Value-impact analyses are intended to support significant changes in regulatory requirements. While the identification of impacts requiring analysis should be liberally construed, there will be some impacts from changes in regulatory requirements which are of such small magnitude that no analysis or statement would be useful. If the preliminary value-impact analysis and sensitivity analysis of variables indicate negligible impact, a statement to that effect may be included and no further analysis or statement need be provided.

4. What types of papers may require value-impact analysis?

a. General

Proposed actions to which these instructions apply include the issuance of new and substantive staff positions (e.g., Branch Technical Positions and other documents issued for guidance in conducting safety and environmental reviews), new and amended regulations, and Commission papers involving a potential change in regulatory requirements or policy.

In general, if a proposed action:

- (1) is a regulatory action; and
- (2) is non-routine or non-recurring (e.g., its effect has a broader reach than a specific licensing action for a particular facility),

then both a value-impact analysis and a value-impact statement are required. If the paper does not meet both requirements, no value-impact analysis or statement is required. However, in that event the paper must include an explanation of why the value-impact statement is not required.

Additionally, if a generic environmental impact statement has been prepared, only a separate value-impact statement is required. Figure 1 shows a suggested determination path chart for identifying papers requiring value-impact analysis.

While all non-routine, non-recurring regulatory actions must be subjected to value-impact analysis, only a value-impact statement, summarizing the elements of the value-impact analysis, is to be included in the Commission paper.

b. Commission Paper

A primary occasion for value-impact analysis will be recommendations to the Commission in the form of staff papers. Regulatory and other matters are forwarded by the staff to the Commission in one of the following four categories of staff papers:

- (1) Policy. A paper which involves a major policy issue intended for discussion with the Commission.
- (2) Consent. A paper which describes a noncontroversial, minor policy issue which it is believed will be approved unanimously, and thus can be resolved without discussion. If unanimous approval is not obtained, the paper becomes a policy item.

- (3) Commission Action. A paper which circulates a draft for Commissioner comment or guidance.
- (4) Information Paper. A paper used for forwarding informational items requiring no action.

By definition, items in the fourth category would not pertain to regulatory actions, hence no value-impact analysis would be required.

The first three categories all require Commission action, i.e., decision, approval, or guidance. They are further divided into the following three categories depending on whether they involve (1) a non-routine, non-recurring regulatory action (e.g., generic licensing actions), (2) a routine or recurring regulatory action (e.g., a specific facility license), or (3) a non-regulatory action (e.g., response to a congressional inquiry).

All Commission papers classified as either "Commission Action Items", "Policy Session Items", or "Consent Calendar Items" should be accompanied by either a value-impact statement or an explanation of the reasons for not including a statement. Such reasons might be that the action is non-regulatory (e.g., paper recommends that the Chairman sign a letter to a Congressman) or that the regulatory action recommended is "routine" or recurring in nature (e.g., approval of a license for a specific facility). Based on an analysis of past Commission papers, it may be expected that the majority of future Commission papers will be of such nature that a value-impact analysis will not be required.

In instances in which it has been concluded that the public would not be significantly affected, a declaration of negative findings is appropriate, i.e., "Analysis indicates inconsequential impact associated with recommendation." A brief statement of the elements evaluated should accompany a negative declaration. In some instances the following statement may be appropriate: "Alternatives to the staff recommendation have been precluded (or limited) by statute (or previous Commission action)."

As a general rule, the depth or extensiveness of a value-impact analysis which supports the value-impact statement should depend on the magnitude of the expected costs and benefits associated with the proposed action, except where anticipated public interest alone would dictate a more complete statement. In any event, though there may be extensive background or supporting analysis, the value-impact statement should be kept as brief as possible.

c. No Analysis for Routine Activities

A value-impact analysis will not be required for our routine activities. Examples of such routine activities are:

Fuel Cycle

Specific safety reviews and their associated environmental reviews/statements for facilities, major and minor package designs, radioisotopes, high level and transuranic waste repositories, and low level waste disposal sites, as well as specific environmental surveys, license amendments, and the like.

Safeguards

NUREG Reports; reports on physical security reviews, material control and accountability reviews, and design guidance; and specific facility and material licensing actions.

However, licensing reviews, Safeguards adequacy inspections and other reviews may identify the need for increased requirements or a reinterpretation of rules, guides, or review criteria. Such increased requirements may have substantial impact and this impact must be evaluated against the intended gain in safety. Therefore, all significant deviations or departures from previous regulatory requirements or review standards should be subjected to value-impact analysis just as though they were proposed new rules, notwithstanding the fact that they may be applied on a specific case basis.

The EDO guidelines contain criteria for determining when a value-impact analysis is required. They are not intended to preclude the preparation of value-impact analyses or statements for specific actions or activities for which an analysis is not required by the guidelines but is deemed advisable by the staff.

D. Elements of Value-Impact Analysis

A value-impact analysis should contain the following elements:

1. Objective: A statement of what the recommended policy action is expected to accomplish.
2. Setting and Background: A description of the problem and analytical approach, including analytical assumptions and a specification of the logical relationship between alternatives and the objective.
3. Alternatives: Identification of different approaches with identical or similar outcomes (or identical or similar costs, if cost is being held constant). Alternatives should include the "base case" or status quo (e.g., a description of the current system).
4. Value and impact estimates: Estimates of the incremental (or marginal, or differential) values (benefits, or levels of effectiveness), and associated impacts (costs, including side effects) of the various alternatives as compared to the base case or status quo.
5. Specification of Criteria: Standards by which the alternatives will be judged and upon which the recommendations will be based.
6. Conclusions and recommendations.

A value-impact analysis sets forth the reasoning to support a decision to change the regulatory base. The analysis should document sequentially the logic utilized in developing a proposed action, in such a manner that a reviewer following the same steps would arrive at the same results and conclusions. All alternatives which were considered should be noted. Any alternatives which were rejected should be set forth with reasons for their rejection.

CAVEAT: Staff preference for a particular result should not be permitted to drive the analysis. An approach which merely justifies a staff preference instead of presenting an objective logical analysis of alternatives is unacceptable. It is not intended that justification of staff preference be ruled out, but rather that it be identified and submitted along with an analysis of other alternatives.

The analyst must develop standards by which the alternatives can be judged and upon which recommendations to the Commission can be based. It is not intended that the criteria be used to arrive at an optimal course of action but rather that they be used to simplify the judgments required by the decision maker.

The value-impact analysis forms part of the basis for the decision on a regulatory action. It may support a decision to be made by the Commission or may simply become part of the file for a decision made at the branch level. Whatever the level of initial decision, the analysis may be subject to further scrutiny in response to an appropriate information request.

In estimating costs, the analyst should consider all undesirable consequences associated with various alternatives, including side effects such as the effect on other systems or components. The source of cost estimates should be included (e.g., if provided by the licensee, have they been validated by the analyst?). The inclusion of other factors such as inflation, discounting, intangibles, or particularly uncertain variables, should be pointed out. Values and impacts should be evaluated for the same base and the same time. Sensitivity analysis of variables should be performed when appropriate.

Many of the most important values and impacts may not be readily expressed in monetary terms, or given a figure of merit. Nevertheless, if the objective of the analysis is clearly defined, if the relationships between the alternatives and the objective are clearly stated, and the limitations of the analysis are recognized, the analyst can still provide a better framework for logical decisionmaking than can be produced by unaided intuition.

E. Other factors separately stated for planning and analysis

While the analysis should not focus exclusively on economic factors, it must separately state the expected costs to the licensee in manpower and dollars.

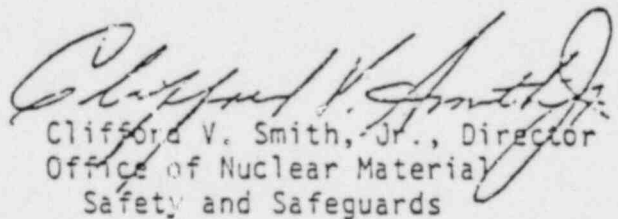
Additionally, for management planning purposes, each Commission paper proposing regulatory action or the assumption of regulatory responsibility must include, separately stated, the "EDO's personal assessment" of the associated costs and resource requirements (in manpower and dollars) to the Commission, or a statement that "the proposed action will not require any additional Commission resources."

In this regard, the cover letter to the EDO must indicate how NMSS would absorb the costs of each new program initiative being proposed if additional resources were not made available, including suggestions as to which currently approved programs and projects would be delayed or dropped in order to implement the new initiative.

F. Staff Responsibilities

1. The branch having primary cognizance over the area of proposed regulatory action is responsible for determining whether or not an analysis is required and for preparing the value-impact analysis and value-impact statement or negative declaration.
2. Inquiries concerning the preparation of value-impact analyses or statements should be directed to the appropriate coordinating branch - the Operations and Planning Branch for Fuel Cycle matters and the Requirements Analysis Branch for Safeguards matters.

3. In the case of Commission papers categorized as "Commission Action Items" and "Policy Session Items" which deal with non-routine, non-recurring regulatory actions, MPA will review the value-impact analysis content in draft before it is sent to the EDO. This review and consultation will be most helpful if it is conducted at the earliest practicable stage. To ensure such timely review, a copy of the first draft of the value-impact analysis for such Commission papers is to be provided immediately to the appropriate coordinating branch for forwarding to MPA. Value-impact analyses should be prepared for "Consent Calendar Items", although these need not be sent to MPA.
  
4. Early consultation with the appropriate coordinating branch can facilitate a determination of whether or not a value-impact analysis or value-impact statement is required in a particular case before a significant amount of staff work is performed.

  
Clifford V. Smith, Jr., Director  
Office of Nuclear Material  
Safety and Safeguards





APR 13 1977

MEMORANDUM FOR: SD Staff

FROM: Robert B. Minogue, Director  
Office of Standards Development

SUBJECT: VALUE/IMPACT GUIDELINES

The attached guidelines are to be used by SD staff in preparing value/impact statements.

The guidelines were developed by an SD Task Force consisting of Jim Mackin (Task Leader), Don Milliken, Abe Eiss, Steve Skjei and Jim Costello. Earlier drafts of the guidelines were tested by SD staff members in preparation of preliminary value/impact statements. Their feedback to the Task Force was useful, and led to a number of modifications to the guidelines as they were developed.

In its use of these guidelines SD staff should be conscious of the need to evaluate their experience and feed back comments and suggestions to the Task Force Leader on how the guidelines can be improved.

Revised guidelines will be issued at appropriate intervals as needs for substantial changes are identified.

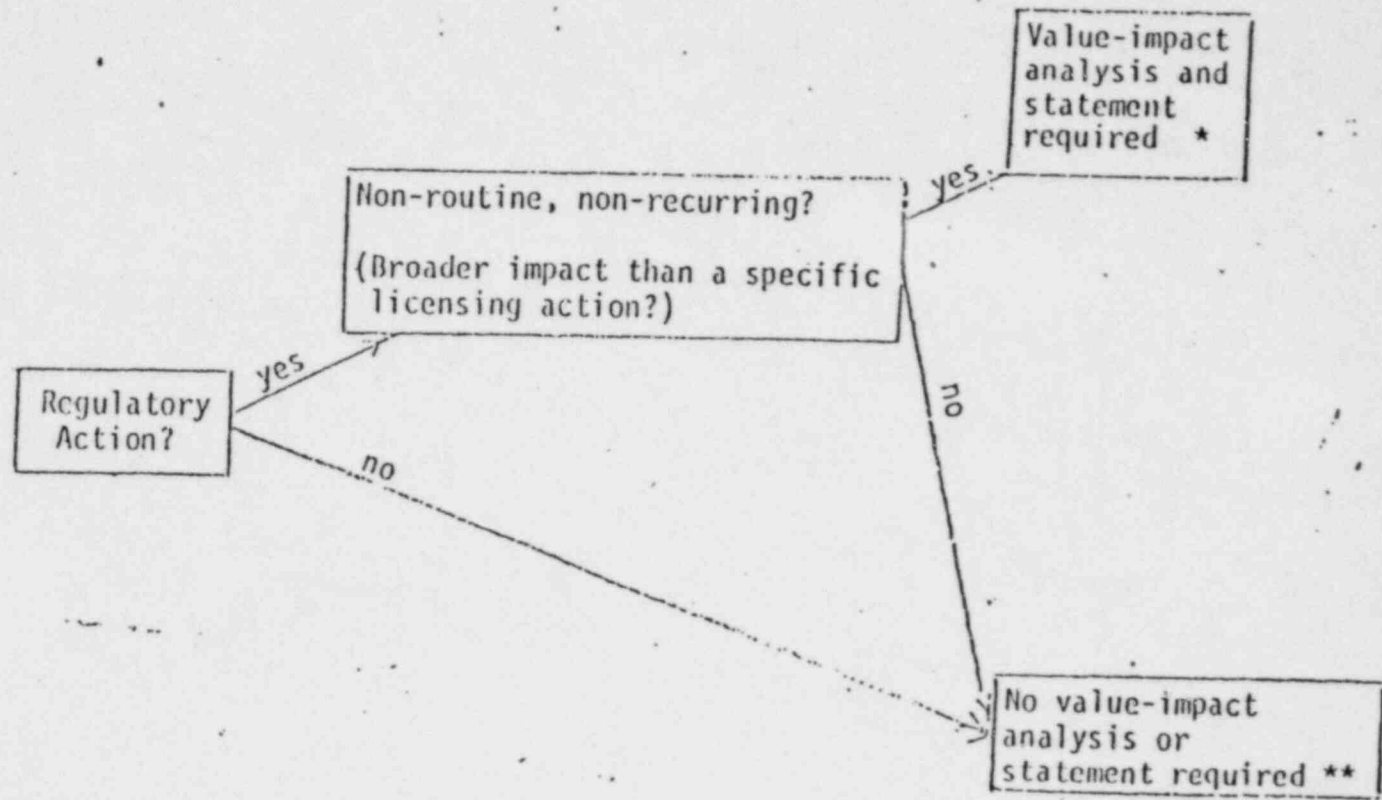
*Robert B. Minogue*  
Robert B. Minogue, Director  
Office of Standards Development

cc w/enc1:  
SD technical personnel  
B. Riordan, PLA

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Figure 1.



\*Special case: if GEIS prepared only value-impact statement is required.

\*\*Statement explaining why no value-impact analysis or value-impact statement is required must be included

Introduction

SD value/impact statements are required at the task initiation stage and accompany the Task Initiation Form (TIF). These guidelines have been directed to this first, or preliminary value/impact statement. Coincident with the initial draft of the working paper on the action, a final value/impact statement is prepared which mainly describes any substantive changes in any important aspect of the proposed action. Copies of the preliminary statement and records of subsequent changes should then accompany the action through to completion. In effect, the complete value/impact record then consists of the original preliminary statement supplemented by summaries of any significant revisions and the basis for the revisions.

The staff guidance is in four parts as follows:

1. General guidance concerning major aspects of the approach to preparing SD value/impact statements,
2. An outline of the structure of the statements,
3. Specific guidance to each section of the statement, and
4. An example statement prepared for a proposed action to provide guidance on normal water level and discharge at nuclear power plants.

SD STAFF GUIDANCE FOR  
PREPARATION OF VALUE/IMPACT STATEMENTS

April 11, 1977

Prepared by: SD Task Force

J. Mackin, Task Leader

D. Milliken

A. Eiss

S. Skjei

J. Costello

section is determined to be inappropriate or not applicable to the proposed action then this should be stated.

2. In these guidelines, impacts are negative, i.e., effects on, or outlays by, somebody or something such as risk, radiation dose, environmental damage, money, time, or some other measure. Conversely, values are positive or beneficial.

3. It is neither sufficient nor acceptable to declare "no impact" from a proposed action because industry has accepted the position (e.g., a national standard is endorsed). Such endorsement does not alter the fact that values and impacts will result. On the other hand, industry acceptance, comments of other government agencies, expert opinion, or other considerations may be important factors in estimating values and impacts of a proposed action, and in weighing several alternatives.

4. No particular analytical technique or formal decision methodology is recommended at this time for comparing the values and impacts of alternatives. In most cases, particularly for preliminary statements, the balancing will be done on the basis of professional judgment. When it is possible, meaningful and appropriate, however, values and/or impacts may be translated into such measures as exposure dose, monetary units, time, risk, etc. In some cases, formal decision methodologies may be applied to choices of alternatives. Methods that can be useful include sequential elimination, threshold levels, matrix methods, cost-benefit analysis, and

## General Guidance

The guidelines are arranged in the form of three separate but related decisions. The first considers the alternatives for accomplishing the proposed action and leads to a go/no-go decision on the action itself (not the procedural method for promulgating the proposed action). The "no action" alternative is part of the first decision. The second decision is on the technical approach and available technical alternatives, particularly concerning trade-offs and their safety implications. The procedural method for accomplishing the action is the third decision, and consists of an analysis of various alternative procedural methods that lead to SD products such as regulations, guides, etc.

Using the above sequential approach a proposed action, for example, would not be to "issue a regulatory guide for the use of respirators to reduce inhalation exposures." Rather, the proposed action would be to "provide guidance for reducing inhalation exposures." Respirators might be the favored technical approach (compared, for example to filters, rotation of personnel, etc.) determined as the second decision. A regulatory guide might be the third decision as the preferred procedural method over a regulation, ANSI Standard endorsed by a regulatory guide, or other procedures for promulgation.

A number of additional considerations should be kept in mind as follows:

1. Each section of the outline should be addressed to the extent necessary to reveal the basis for a given conclusion. If a particular

utility methods. Brief descriptions of these approaches can be found in a recent Battelle Northwest report.\* The report also includes background information for use in refining the value/impact assessment process.

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\* P. L. Hendrickson, et al., "Review of Decision Methodologies for Evaluating Regulatory Actions Affecting Public Health and Safety," BNWL-2158, December 1976.

## SD VALUE/IMPACT STATEMENT OUTLINE

- I. The Proposed Action
    - A. Description
    - B. Need for the Proposed Action
    - C. Value/Impact of the Proposed Action
      - 1. NRC Operations
      - 2. Other Government Agencies
      - 3. Industry
      - 4. Workers
      - 5. Public
    - D. Decision on the Proposed Action
  
  - II. Technical Approach
    - A. Technical Alternatives
    - B. Discussion and Comparison of Technical Alternatives
    - C. Decision on Technical Approach
  
  - III. Procedural Approach
    - A. Procedural Alternatives
    - B. Value/Impact of Procedural Alternatives
    - C. Decision on Procedural Approach
  
  - IV. Statutory Considerations
    - A. NRC Authority
    - B. Need for NEPA Assessment
  
  - V. Relationship to Other Existing or Proposed Regulations or Policies
  
  - VI. Summary and Conclusions
- References



Specific Guidance

I. The Proposed Action

- A. Description - Describe the essential facts of the proposed action. Use general terms rather than referring to a specific product such as a regulation, regulatory guide, branch position, etc., (these are procedural approaches and are described in III below). In most cases, the proposed action will be to provide some type of guidance to applicants or licensees on matters of health, safety, environment, safeguards, siting, etc.
  
- B. Need for the Proposed Action - Describe the factors that have led to the proposed action such as safety concerns, environmental impact mitigation, inspection and enforcement problems, changes in policy, or other factors. The description should establish the baseline, or current situation, that underlies the need for the proposed action.
  
- C. Value/Impact of the Proposed Action
  - 1. NRC Operations - Describe the expected value to NRC regulatory functions and the expected impacts in terms of NRC time and resources required for implementation,

licensing review, inspection, enforcement and other functions. Impacts may include funding requirements for needed technical assistance or research, such as contracts with other government agencies or consultants.

2. Other Government Agencies - Indicate whether assistance will be expected from federal, state or local agencies and the extent of such assistance. Describe the values and impacts of the action, if any, to the same agencies.
3. Industry\* - Estimate the values and impacts (e.g., time and costs) for (1) any expected participation by industry in preparation and review of documents and (2) the future value and impact of implementation, practice, and in some cases reporting requirements for applicants and licensees. These latter requirements may have significant value to the staff and public but will also result in impacts to the applicant or licensee.
4. Workers - Describe the values and impacts to affected workers, particularly those who are occupationally exposed to radiation and/or radioactive materials, in a manner intended to assist in the evaluation of the alternatives considered as well as the final decision on the proposed action. Estimate the individual

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\* Industry should be interpreted in a broad sense to include parties other than the general public that may be affected directly or indirectly by SD regulatory actions. Thus, the definition will include parties dealing with, or potentially affected by, radiation sources in radiopharmaceutical firms, hospitals, fuel cycle facilities including fuel and waste storage facilities, transportation activities and commercial products.

and collective (man-rem) dose and associated risk that will be caused, or saved, due to implementation of each alternative. If the regulatory action is intended to minimize or prevent exposures of members of the public, compare the public collective dose and risk that would be prevented with the occupational collective dose and risk that would be caused. Provide information regarding the probability that public exposure will occur if the regulatory action is not taken.

5. Public - Describe values and impacts to all, or segments of, the public.

- D. Decision on the Proposed Action - State whether the proposed action should or should not be undertaken.

## II. Technical Approach

- A. Technical Alternatives - List alternative technical methods for accomplishing the proposed action. The number of technical alternatives will not usually be numerous, but should be enumerated if they can reasonably achieve the objective of the proposed action.
- B. Discussion and Comparison of Technical Alternatives - For each alternative discuss the technical factors that are involved with respect to the proposed action. Particular attention should be given to the tradeoffs that may be involved. For example, stiffening a reactor core to reduce internal vibration may lead to increased susceptibility to ground movement; lower limits on effluents offsite may result in increased occupational doses onsite; the installation of straps to prevent pipe failure due to vibration may actually induce a higher risk of failure by constraining thermal expansion and contraction during heatup and cooldown. These examples are not necessarily inclusive or typical. However, they illustrate the important point that any given remedial action must necessarily

result in some type of reaction, and the extent and probability of the reaction needs to be identified and balanced against the expected value of the proposed action. In addition, tradeoffs are involved not only in hardware related actions but also include such actions as the processing and analysis of data, proposals for conducting practice public emergency evacuation, and similar measures.

- C. Decision on Technical Approach - State whether the proposed action should or should not be undertaken, and the technical approach that is proposed to accomplish the action.

### III. Procedural Approach

- A. Procedural Alternatives - List alternative procedural or administrative approaches that can be utilized to accomplish the proposed action. The SD alternatives will usually be limited to:

- Regulation
- Preparation or Revision of a Regulatory Guide
- ANSI Standard, endorsed by a Regulatory Guide
- NUREG Report
- Branch Position

B. Value/Impact of Procedural Alternatives - Discuss the arguments for and against a particular alternative and other possible and reasonable alternatives. For many actions the choice of procedural method will usually be straightforward. In some cases, however, the choice may be difficult and require a more extended discussion of values and impacts as they relate to NRC, other government agencies, industry and the public.

C. Decision on Procedural Approach - Identify the procedural method selected and whether it should be developed and implemented.

#### IV. Statutory Considerations

A. NRC Authority - In essentially all cases regulatory actions originating in or issuing from SD will derive their basic statutory authorities from the Atomic Energy Act (the Act), the Energy Reorganization Act, or the National Environmental Policy Act (NEPA). From these statutes flow regulatory authorities or requirements that are promulgated as regulations in the several parts of 10 CFR. To implement these regulations NRC has promulgated a series of Regulatory Guides. To contrast these regulatory tools, note that a regulation flows directly from statutory authority whereas a guide flows from the requirements of a regulation. This means that regulations have a full

force of law and guides do not. In practice, however, guides have been applied by licensing review staff and been considered by industry to have nearly the same force as regulations. This occurs principally because of the timeliness of accepting the solution or position presented in a guide when compared to the task of developing and defending an alternative solution. In any event, it is important to understand and describe the relationship of the proposed action to the authority that provides the basis for promulgation.

B. Need for NEPA Statement - A preliminary evaluation should be made as to whether the proposed action is a major action that may significantly affect the quality of the human environment and thus require preparation of an environmental impact statement. For guidance on this question see 10 CFR 51 and particularly 10 CFR 51.5(a)(10), 10 CFR 51.5(b)(6), and 10 CFR 51.5(d)(3).

V. Relationship to Other Existing or Proposed Regulations or Policies - Determine and describe any potential conflicts or overlaps with other agencies, e.g., EPA, CE, FPC, FEA, DOT, that may have parallel or opposing requirements to the proposed action. If known, also include State and local agencies. In addition, include an estimate of back-fitting implications that may fall within the review procedures of RRRC.

VI. Summary and Conclusions - Summarize the proposed action, and the selected procedural approach.

References - List the references used in preparing the value/impact statement.



PRELIMINARY VALUE/IMPACT ASSESSMENT ON  
NORMAL WATER LEVEL AND DISCHARGE AT NUCLEAR POWER PLANTS

I. The Proposed Action

A. Description

Some structures at most nuclear power plants are subject to continual loading from ambient ground water levels, from flows and water levels in streams, or from water levels in lakes, reservoirs or oceans. In considering the effects of design basis natural and accidental events, such as earthquakes, tornadoes, hurricanes, plane crashes, transportation accidents, explosions, fires, or LOCA, it is necessary to include the loading from the water level (or discharge) in the design calculations, as well as the loads on the structure caused by the design basis event. The proposed action will provide guidance on acceptable methodology and data sources for determining these "normal" water levels and discharges.

B. Need for the Proposed Action

No definition of the normal water levels and discharges to be used coincidentally with design basis events has been published by NRC, nor has the practice of applicants or the staff in this respect been uniform. Delays in acceptance of structures have occurred because of this lack of uniformity. A definite need for criteria covering this parameter exists.

C. Value/Impact of the Proposed Action

1. NRC

The normal water level or flow proposed by the applicant will be determined by the same methodology as that used by the staff. In most cases, determination of the values is fairly precise and is not highly dependent on interpretation or engineering judgment. Therefore, there should be a minimum of cases where the applicant and the staff disagree radically on the value. It is estimated that use of the methodology to be proposed will not average more or less staff time than for the various methods previously used.

2. Other Government Agencies

Not applicable, unless the government agency is an applicant, as TVA.

3. Industry

The value/impact on applicants will be the same as for the NRC staff. Determination of the proposed normal levels

or discharges is estimated to require from one to five man-days on the average. It is believed that this compares favorably with the time required for previous approaches. Some economic savings (possibly up to several thousand dollars) would accrue to applicants in those cases which could have been disputed by the staff, using the existing procedures.

#### 4. Public

No impact on the public can be foreseen. The only identifiable values are a minor decrease in cost of nuclear power plants and a slight acceleration in the review process.

#### D. Decision on the Proposed Action

Guidance should be furnished on normal water levels and discharges.

### II. Technical Approach

#### A. Technical Alternatives

The proposed action requires specification of three primary parameters each of which can be expressed in alternative terms. The primary parameters are:

- Frequency of occurrence of normal
- Length of record to be used
- Seasonality of events

Alternative approaches to specifying these parameters are described in the following section.

## B. Discussion and Comparison of Technical Alternatives

### 1. Frequency of occurrence of normal

Because the design basis events are of low probability of occurrence, the simultaneous occurrence of the normal water level (or discharge) should logically be of high probability. Two alternatives were considered as definitions of the normal, the mean and the median.

The mean and the median will be essentially the same for most water bodies, including ground water, oceans, lakes and reservoirs. This is because such bodies do not have rapid changes from low to high and the range between the extremes is relatively small. For streams and estuaries, however, the mean is almost invariably higher than the median, because of the greater effect of floods on the mean.

As a simplified example, the annual mean for a year of stream flow record with only one flash flood could be higher than the flow on all days except the day of the flood. The median, of course, by definition is the point at which the flow on half the days is higher and half lower.

2. Length of record to be used

Thirty to fifty years of record has traditionally been considered to be a minimum sample to produce meaningful hydrologic characteristics. Another approach would be to leave the period of record unspecified but to require that it be long enough to cover major cycles in the data, such as wet and dry periods for streamflow, or the 19-year (plus) cycle in lunar tides.

3. Seasonality of events

Some design basis events (earthquakes, plane crashes, transportation accidents, explosions, fires, and LOCA) may occur at any time of year. Other events (floods, tornadoes, and hurricanes) may be seasonal. Two alternatives were considered, i.e., to consider the seasonality of the design events, or to ignore it.

An example of a seasonal event is a hurricane. They are more numerous during September and October. Coincidentally, this is the season of high flow in southern Florida, but the season of low flow in Texas. Thus, if the median were based on the entire year, it would be too low in Florida, but too high in Texas.

C. Decision on Technical Approach

1. While the mean would be more conservative for streams and estuaries, the median is considered of sufficient conservatism.
2. While 50 years of data is desirable, in some cases records of that length are not available. Therefore, it was decided to recommend 50 years but to accept a shorter record (not less than 12 years) if it could be demonstrated that major wet and dry periods were included. A 20-year period should be used for oceans and for estuaries that are strongly influenced by tide.
3. The normal should be determined on the basis of data for that part of the year in which the design basis event is likely to occur.

### III. Procedural Approach

#### A. Procedural Alternatives

Potential SD procedures that may be used to promulgate the proposed action and technical approach include the following:

- Regulation
- Regulatory Guide
- ANSI Standard, endorsed by a Regulatory Guide
- Branch Position
- NUREG

#### B. Value/Impact of Procedural Alternatives

A NUREG is not a viable alternative because the guidance will contain positions. No ANSI standard on the subject is under preparation. Because of the time (2 to 3 years) for preparation of an ANSI standard, this alternative was eliminated.

The matter is not of sufficient importance to justify issuance of a regulation. Only a Regulatory Guide or a Branch Position are viable alternatives.

Branch Positions are sometimes prepared for guidance of this sort. Because of the limited distribution of Branch Positions, however, they should be followed by a Regulatory Guide. In this case, no Branch Position has been prepared or is anticipated.

C. Decision on Procedural Approach

A Regulatory Guide should be prepared.

IV. Statutory Considerations

A. NRC Authority

This guide would fall under the authority and safety requirements of the Atomic Energy Act. In particular under General Design Criterion 2, Appendix A, 10 CFR 50, which requires, in part, that structures, systems and components important to safety be designed to withstand natural phenomena.

B. Need for NEPA Assessment

The proposed action is not a major action, as defined by 10 CFR 51.5(a)(10), and does not require an environmental impact statement.

V. Relationship to Other Existing or Proposed Regulations or Policies

When Regulatory Guide 1.70 (Standard Format and Content) is revised, mention of the necessity to evaluate normal levels and flows should be added. It will not be necessary to include, in Regulatory



Guide 1.70, all of the material on methodology and data sources which is contained in the proposed guide.

As the normal level and discharge is usually a relatively minor contributor to structure loading when design basis events are considered, it is probable that backfitting will not be necessary. The criteria have most likely been approximated with sufficient accuracy that no structure designs will have to be changed.

#### VI. Summary and Conclusions

A Regulatory Guide on normal water levels and discharges should be prepared. Suggested methods for determining the normal water level (or discharge) should be given for ground water, streams, estuaries, lakes, reservoirs, and oceans. Seasonality and duration of the design basis events should be considered as appropriate, and sources of data given.

#### References

None.

Donald L. Milliken  
3/18/77



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

Item # 24

January 31, 1978


MEMORANDUM FOR: Roger S. Boyd, Director, DPM  
Harold Denton, Director, DSE  
Roger J. Mattson, Director, DSS  
Victor Stello, Jr., Director, DOR

FROM: Edson G. Case, Acting Director  
Office of Nuclear Reactor Regulation

SUBJECT: INSTRUCTIONS FOR THE PREPARATION OF VALUE-IMPACT ANALYSES  
NRR OFFICE LETTER NO. 16

In accordance with the value-impact guidelines given in SECY-77-388 and the guidance given in the August 5, 1977 memorandum from S. J. Chilk to L. V. Gossick, the attached instructions have been developed for use in NRR for the preparation of value-impact analyses in support of significant changes in regulatory requirements. Effective immediately, all NRR divisions will use these instructions in the development of value-impact analyses to assure that all significant alternatives and other considerations have been identified and weighed prior to NRR management approval, including RRRC consideration, and staff implementation of significant changes in regulatory requirements. After a period of one year the instructions will be reviewed and changed as necessary to reflect experience in their utilization.

The August 5, 1977 memorandum identifies other issues, not accounted for in the attached instructions, that should be addressed in implementing the value-impact guidelines. These include allocation of resources (staffing, training, outside contracts, etc.), assignment of points of contact, and the development of manuals. No special guidelines are presently established with regard to these issues. They will be developed in the future to supplement the present policy, if the need is identified.

  
Edson G. Case, Acting Director  
Office of Nuclear Reactor Regulation

Enclosures:

1. Instructions for Preparing Value-Impact Analyses
2. Memo from Chilk to Gossick  
dtd 8/5/77

OFFICE OF NUCLEAR REACTOR REGULATION

"Instructions for the Preparation  
Of Value-Impact Analyses"

Introduction

Value-impact analyses shall be performed for each significant change in regulatory requirements to demonstrate that all significant alternatives and considerations were identified and weighed. The alternatives and considerations to be weighed include all the values to be gained, such as contribution to public health and safety and reduction in environmental damage, and all the impacts that result, such as increased risk to plant operators, increased environmental damage and increased costs. A value-impact analysis should not be construed to mean that cost considerations take precedence over considerations of health, safety, or national security. These factors remain paramount. Cost, however, is an important factor in many regulatory matters and must be a prime consideration when there are alternative means of achieving desired levels of health, safety and national security.

Value-impact analysis as interpreted by the staff is essentially a technique equivalent to benefit and cost analysis, or cost and effectiveness analysis. The term value-impact was introduced at NRC to dispel certain connotations associated with the other terms. Benefit-cost analysis, in particular, is often misconceived as a process of reducing all factors to a common dollar form. This, the staff felt, was too restrictive, and therefore the terms value and impact were recommended and designed to include noncommensurables, and variables that are nonquantifiable or nonmeasurable. Thus, it was believed that the new terms would allow for analysis to incorporate very

important but nonquantifiable judgments of the staff and other expert parties. It should be noted, however, that cost-benefit and cost-effectiveness analyses, properly conducted, have just as broad a scope as that envisioned by the staff for value-impact analysis.

Proposed actions to which these instructions apply include the issuance of new and substantive staff positions (Regulatory Guides, Branch Technical Positions, and other positions given in the Standard Review Plans for both safety and environmental reviews), new and amended Regulations, and Commission papers involving a potential change in regulatory requirements or policy. Generic and specific environmental impact statements are excluded because they customarily contain both an analysis of alternatives and a cost/benefit analysis. These instructions also will not apply to the case-by-case licensing activities by NRR Divisions on construction permit and operating license applications and amendments or operating reactor orders and amendments. Decisions in these cases flow from the existing regulatory base (regulations, guides, and review procedures) and involve technical judgment to assure that an acceptable level of safety results in each case. In the main, these routine licensing activities do not involve changes to the basic framework for the licensing and regulation of nuclear power plants and therefore do not warrant a value impact analysis of the scope discussed in this document. However, licensing reviews for CPs and Ols have, in the past, exhibited a tendency for escalating regulatory requirements through reinterpretation of rules, guides and review procedures. Such escalations sometimes have a considerable impact with little perceptible gain in plant safety. To control this tendency, all significant deviations or departures should be subjected to value-impact analysis just as though they were proposed new guides or branch positions. The fact that they are applied on case reviews is not cause for exemption.

In general, a value-impact analysis should document sequentially the logic utilized in developing a proposed action, with each step in the logic sequence accompanied by a value-impact analysis pertinent to the step, as appropriate. The outline of a value-impact analysis is shown in Table 1.

For the case of Commission papers, only a few of which are expected to require a value-impact analysis, the value-impact analysis would be provided in addition to the discussion of alternatives identifying pros and cons normally included in Commission papers. These are generally more subjective in nature than the value-impact analysis addressing administrative, procedural and budgetary areas appropriate for Commission-level consideration. Only the summary and conclusions of the value-impact analysis need be appended. For the case of other proposed actions, the value-impact analysis will serve as the primary vehicle for justifying the proposed action. As such it should be appended in its entirety to the documentation containing the proposed action as it traverses the review and approval process through NRR management, including RRRRC or ACRS.

✓ The first major element of the value-impact analysis involves establishing the need for a change in the regulatory base. The guidelines require consideration of both the values and the impacts in establishing that there is need for a change. The second major element is consideration of the available technical alternatives involved in developing the selected approach including trade-offs of the various technical factors and their safety, environmental, or safeguards implications. The third factor involves an assessment of the safety or environmental significance of the proposed action with regard to the associated plan for implementation on nuclear power plants in various stages of design, construction and operation. The final factor is consideration of the procedural method for implementing the action. It consists of an identification of the rationale for selection of the procedural method, such as a regulation, a regulatory guide, a branch technical position, or a Commission policy statement.

As an example, applying the above sequential approach for value-impact analyses to the case of guidance for fire protection for nuclear power plants, the first decision is whether additional requirements or guidance for fire protection are warranted, and includes consideration of the alternative of taking no action at all. The second decision is whether the favored technical approach should be separation, barriers, detection equipment, extinguishing equipment or some combination. The third decision involves an assessment of the safety significance of the fire protection guidance with regard to the plan for implementation of the guidance, in whole or in part, for the spectrum of nuclear plants, ranging from new applications to operating plants. The fourth decision is issuance of the guidance or requirements in regulation, regulatory guide, branch technical position, or other form.

In the interest of efficiency and reduced paperwork, the guidelines are structured so that only preferred actions are examined in detail to establish the best method of implementation. Experience shows that significant costs can be associated with the method of implementation. Therefore, it is important that the interrelationship between technical and procedural alternatives be well understood and explained in the analyses so as not to overlook cost-effective methods of achieving necessary changes in the regulatory base.

In preparing value-impact analyses, the following general guidance should be utilized:

1. Each section of the outline should be addressed to the extent necessary to reveal the basis for a given conclusion. If a particular section is determined to be inappropriate or not applicable to the proposed action, this should be so stated.

2. In these guidelines, impacts are negative, i.e., effects on, or outlays by, somebody or something such as risk, radiation dose, environmental damage, money, time, or other measure. Conversely, values are positive or beneficial, i.e., contribution to public health and safety, reduction in radiation dose, reduction in environmental damage, etc.
3. It is neither sufficient nor acceptable to declare "no impact" from a proposed action because industry has accepted the position (e.g., a national standard is endorsed). Such endorsement does not alter the fact that values and impacts will result. On the other hand, industry acceptance, comments of other government agencies, expert opinion, or other considerations may be important factors in characterizing the weight of particular values and impacts of a proposed action, and in weighing several alternatives.
4. No particular analytical technique or formal decision methodology is recommended at this time for comparing the values and impacts of alternatives. In most cases, particularly for preliminary statements, the balancing will be done on the basis of professional judgment. When it is possible, meaningful and appropriate, however, values and impacts should be translated into such measures as exposure dose, monetary units, time, risk, etc.

Table 1

VALUE-IMPACT ANALYSIS

I. The Proposed Action

- A. Description
- B. Need for the Proposed Action
- C. Value-Impact of the Proposed Action
  - 1. NRC Operations
  - 2. Other Government Agencies
  - 3. Industry
  - 4. Public
- D. Decision on the Proposed Action

II. Technical Approach

- A. Technical Alternatives
- B. Discussion and Comparison of Technical Alternatives
- C. Decision on Technical Approach

III. Plan for Implementation

- A. Safety or Environmental Significance of the Proposed Action
- B. Decision on the Plan for Implementation

IV. Procedural Approach

- A. Procedural Alternatives
- B. Value-Impact of Procedural Alternatives
- C. Decision on Procedural Approach

V. Statutory Considerations

- A. NRC Authority
- B. Need for NEPA Statement

VI. Summary and Conclusions

References



VALUE-IMPACT ANALYSIS

I. The Proposed Action

- A. Description - This section should provide a description of the proposed action. In most cases, the proposed action will be to provide some type of guidance, either new guidance or a revision to existing guidance, to applicants or licensees on matters of health, safety, environment, siting, or national security.
  
- B. Need for the Proposed Action - Describe the current situation that underlies the need for the proposed action. Discuss the reasons for proposing a change such as safety concerns, environmental impact mitigation, changes in policy, or other factors, including consideration of "no action" at all. In short, where are we now with regard to the area of concern, and why do we want to change.
  
- C. Value-Impact of the Proposed Action - Describe the values and impacts associated with the proposed action for each affected group.
  - 1. NRC Operations - Describe the expected values to the NRC regulatory function and the expected impacts in terms of resources required for implementation, licensing review and other functions. Impacts may include funding requirements for needed technical assistance or research, such as contracts with other Federal agencies or consultants.

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2. Other Government Agencies - Describe the values and impacts of the proposed action to other government agencies including Federal, state, or local agencies. Indicate whether assistance will be expected from any of these agencies and the extent of such assistance.

Determine and describe any potential conflicts or overlaps with other agencies, e.g., EPA, CEQ, DOE, DOT, that may have parallel or opposing requirements to the proposed action. If known, also include State and local agencies.

3. Industry\* - Estimate the values and impacts for (a) any expected participation by industry including the preparation and review of documents, and (b) any subsequent implementation by industry including reporting requirements, if any, for applicants and licensees. Reporting requirements may have significant value to the staff and public but will also impact the applicant or licensee. Identification of significant comments received from industry groups through discussions or other communications should be included, as appropriate.
4. Public - Describe values and impacts expected to the public or segments of the public. Identification of significant comments received from the public should be included as appropriate.

\*Industry should be interpreted in a broad sense to include all parties other than the general public that may be affected directly or indirectly by NRC regulatory actions. Thus, the definition will include workers involved with nuclear power plant facilities (including both nuclear suppliers and the utilities).

- D. Decision on the Proposed Action - Provide a summary statement as to why the proposed action should be undertaken.

## II. Technical Approach

- A. Technical Alternatives - List alternative technical methods for accomplishing the proposed action. The number of technical alternatives will not usually be numerous, but any that can reasonably achieve the objective of the proposed action should be included.
  
- B. Discussion and Comparison of Technical Alternatives - For each alternative discuss the technical factors, as values and impacts, that are involved with respect to the proposed action. Particular attention should be given to the trade-offs that may be involved. As examples, stiffening a reactor core to reduce internal vibration may lead to increased susceptibility to effects from ground movement; lower limits on effluents offsite may result in increased occupational doses onsite; the installation of straps to prevent pipe failure due to vibration may increase risk of failure by constraining thermal expansion and contraction during normal heatup and cooldown. These examples are not necessarily inclusive or typical. However, they illustrate the important point that any given change usually induces a reaction, and the extent and probability of the reactions affecting safety need to be identified and balanced against the expected value of the proposed action. In addition, trade-offs are involved not only in hardware-related actions but also include such software-oriented actions as the processing and analysis of data, proposals for conducting practice public emergency evacuation, and similar measures.

- C. Decision on Technical Approach - In the light of the technical approaches considered, re-evaluate whether the proposed action should or should not be undertaken, and state the technical approach that is selected to accomplish the action.

### III. Plan for Implementation

- A. Safety or Environmental Significance of the Proposed Action - Make a determination of the significance to safety or the environment of the proposed action, and present the rationale used in making the determination. This should result in the classification of the proposed action into one of the following categories:

- (1) Small improvement to safety or protection of the environment that warrants implementation on new plants only.
- (2) Greater improvement to safety or protection of the environment that warrants a review of plants that are licensed or operational for possible implementation on a case-by-case basis in addition to implementation in new plants.
- (3) Significant improvement to safety or protection of the environment that warrants implementation on all plants regardless of design, construction, or operational status.

The determination should include a description of the expected value to the public health and safety or for protection of the environment to be achieved in implementing the proposed action

on the plants associated with the selected category of significance. It should also include a description of the expected impact for the selected implementation plan. Consider pertinent comments from the public and industry as appropriate. Provide a staff response to these comments.

- B. Decision on the Plan for Implementation - State the conclusion reached on the selected plan for implementation of the proposed action.

#### IV. Procedural Approach

- A. Procedural Alternatives - List alternative procedural or administrative approaches that can be utilized to accomplish the proposed action. The alternatives will usually be limited to:
- o Regulation
  - o Preparation or revision of input for a regulatory guide
  - o NUREG Report
  - o Branch Technical Position
  - o Commission Paper
- B. Value-Impact of Procedural Alternatives - Discuss the arguments for and against a particular alternative and other possible and reasonable alternatives. For many actions the choice of procedural method will usually be straightforward. In some cases, however, the choice may be difficult and require a more extended discussion of pros and cons as they relate to NRC, other government agencies, industry and the public.

- C. Decision on Procedural Approach - Identify the procedural method selected for development and implementation.

V. Statutory Considerations

- A. NRC Authority - In essentially all cases regulatory actions originating in or issuing from NRC will derive from basic statutory authorities, namely, the Atomic Energy Act (the Act), the Energy Reorganization Act, or the National Environmental Policy Act (NEPA). From these statutes flow regulatory procedures, authorities, or requirements that are promulgated as regulations in the several parts of 10 CFR. To implement these regulations NRC has promulgated a series of Regulatory Guides. To contrast these regulatory tools, note that a regulation flows directly from statutory authority, whereas a guide flows from the requirements of a regulation. This means that regulations have full force of law, and guides do not. In practice, however, guides have been applied by licensing review staff and been considered by industry to have nearly the same force as regulations. This occurs principally because of the timeliness of accepting the solution or position presented in a guide when compared to the task of developing and defending an alternative solution. In any event, it is important to understand and describe the relationship of the proposed action to the authority that provides the basis for its promulgation.
- B. Need for NEPA Statement - A preliminary evaluation should be made as to whether the proposed action is a major action that may significantly affect the quality of the human environment

and thus require preparation of an environmental impact statement. For guidance on this question see 10 CFR 51 and particularly 10 CFR 51.5(a)(10), 10 CFR 51.5(b)(6), and 10 CFR 51.5(d)(3).

VI. Summary and Conclusions

Summarize the value-impact analysis for the proposed action including:

- (1) A description of the proposed action,
- (2) The technical alternatives considered and the alternative selected,
- (3) The plan for implementation,
- (4) The procedural approach selected, and
- (5) Other significant considerations.

References - List the references used in preparing the value-impact statement.

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

August 5, 1977

MEMORANDUM FOR: Lee V. Gossick, Executive Director  
for Operations.

FROM: Samuel J. Chilk, Secretary

SUBJECT: COMMISSIONER COMMENTS ON IMPACT-VAJ  
(SECY-77-388) AND MBO VI, PART A

The Commissioners have reviewed the proposed impact-value assessment guidelines contained in SECY-77-388 and Commissioner Kennedy has been briefed on MBO VI, Part A. Detailed comments on the draft guidelines are attached to this memorandum.

Because the success of impact-value depends heavily on how it is actually carried out, each of the staff offices should develop specific plans for implementing the guidelines in their particular circumstances of operation. These action plans should address such issues as:

- o Establishment of office policy, criteria, and examples for deciding when or when not to issue an impact-value assessment, including (1) the types of appropriate uses and (2) the threshold of significance for impacts.
- o Allocation of resources for implementation, management and quality control (including staff, training, and perhaps contracts on methodology development).
- o Assignment of responsibilities and points of contact within each office for the preparation, review, distribution and utilization of impact-value assessments.
- o Desirability of developing manuals providing detailed assistance and examples of relevance to the particular tasks of each office, consistent with the general guidance in SECY-77-388.
- o As each office develops its action plans, the Commissioners should be kept informed with regard to the range of available alternatives.

Enclosure 2



August 5, 1977

Agency-wide Objectives VI, Part A should be expanded beyond roman numeral three to include an overview section which tracks the development and implementation of these action plans. The Commission should review and approve the amended MBO. The proposed guidelines contained in SECY-77-388 reaffirm the Commission's dedication to the use of impact-value assessments as a matter of policy. Once the full Commission is on board, further briefings on impact-value assessment will probably be necessary before final Commission action on the guidelines is taken. Because of the importance of this matter, representatives of the various line offices should plan on attending when the Commission considers IVA again.

Enclosure:

As stated

cc: Commissioner Gilinsky  
Commissioner Kennedy  
Jim Hard, OCM  
James Kelley  
Ken Pedersen



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

Item # 25

FEB 16 1979

MEMORANDUM FOR: All Office Directors

FROM: Norman M. Haller, Director  
Office of Management and Program Analysis

SUBJECT: REVIEW OF AGENCY-WIDE VALUE-IMPACT GUIDELINES

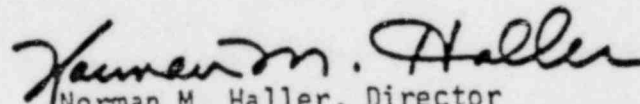
The Commission has requested that:

1. The staff review the agency-wide Value-Impact Guidelines as a prelude to publishing them in the Federal Register for comment. (See Attachments 1 and 2.)
2. The staff also review any office level guidelines to determine if they should be made available for public comment.

I would appreciate your review of the attached agency Value-Impact Guidelines; please provide us any suggested modifications. Also, please let me know if you think your office-specific value-impact guidelines should be published for public comment.

When the Commission approved the agency-wide guidelines in January, 1978 Commissioner Bradford asked that after one year the staff be surveyed to determine whether the guidelines had in any way discouraged the development of new regulations. (See Attachment 3.) In order to be fully responsive to the Commissioner's concern, I ask that you provide each member of your staff the opportunity to submit written comments on this matter. Please forward your office responses to my office.

I would appreciate your sending me the requested information by March 5. We will use your responses to prepare the Federal Register notice.

  
Norman M. Haller, Director  
Office of Management & Program Analysis

Attachments:

1. Memo dtd 1/18/79 from S.J.  
Chilk to L.V.Gossick
2. Guidelines for Conducting Value-Impact Analysis
3. Memo dtd 1/23/78 from S.J.  
Chilk to L. V. Gossick

Contact: John A. Sullivan  
492-7721