POLICY ISSUE
(NOTATION VOTE)

January 22, 2001 SECY-01-0009

FOR: The Commissioners

FROM: William D. Travers
Executive Director for Operations

SUBJECT: MODIFIED REACTOR SAFETY GOAL POLICY STATEMENT

PURPOSE:

To recommend to the Commission a modified version of the Commission's Reactor Safety Goal Policy Statement in response to the Commission's Staff Requirements Memoranda on SECY-97-208, SECY-98-101, SECY-99-191, and SECY-00-0077.

BACKGROUND:

The policy statement on reactor safety goals was initiated because of recommendations of the President's Commission on the Accident at Three Mile Island. The content of the policy statement was discussed in many forums before the Commission issued *Safety Goals for the Operations of Nuclear Power Plants; Policy Statement* in 1986.

This policy statement was not a regulation, but influenced various regulatory actions, primarily the development of the Regulatory Analysis Guidelines used in backfit analyses and the guidance developed for risk-informing reactor regulatory activities. Updating the policy statement will provide a current, high level statement of Commission intent that can guide the development of reactor rulemaking activities and changes in reactor regulatory practices. The reactor Safety Goals apply to reactor accidents and do not address environmental considerations, worker protection, routine operation, sabotage, nonreactor activities, or safeguards matters.

Subsequently, the Commission provided further direction on implementation of the Safety Goals to the staff by a memorandum dated June 15, 1990, responding to SECY-89-102.

Possible revisions to the Reactor Safety Goal Policy Statement, which would incorporate guidance from the June 15, 1990, SRM and reflect current practice, were discussed with the Commission and guidance was provided in the SRMs on SECY-98-101 and SECY-99-191.

CONTACT: Joseph A. Murphy, RES
(301) 415-5670

In SECY-00-0077, the staff proposed specific modifications to the policy statement. By SRM dated June 27, 2000, the Commission provided direction as follows:

> The Commission has approved the staff's recommendations to modify the reactor safety goal policy statement (RSGPS), as described in SECY-00-0077, except for the following items. The Commission disapproved the proposed change to elevate the qualitative statement of prevention of severe core damage accidents to a qualitative safety goal (Option 1 of Issue 2). The Commission also disapproved the staff's recommendation to include the statement "there be no adverse impact on the environment" in this policy statement (Issue 8). The Commission supports a qualitative statement expressing the Commission's intent to protect the environment. The statement should indicate that the NRC will consider the need to minimize adverse environmental impacts in its regulatory decision-making.
>
> The staff should incorporate in the RSGPS the Commission policy that safety goals are "goals" and not limits.

DISCUSSION:

We have followed the Commission direction in the referenced SRM, making the approved changes but leaving the bulk of the original statement intact. Two copies of the proposed modified Reactor Safety Goal Policy Statement are attached. Attachment 1 is a clean copy with all corrections made. In Attachment 2, the deletions in the original statement are enclosed in brackets [ ], while new material is presented in **bold.**

During our evaluation process that led to SECY-00-0077, a public workshop was held on November 9, 1999, to discuss the advantages and disadvantages associated with each change under consideration. As discussed in SECY-00-0077, while not large, attendance included representatives from NEI, Public Citizen, a utility, an architect-engineer, two State governments, consultants, national laboratories, and a foreign utility. NEI also provided written comments after the workshop. The results of this workshop and comments received were considered by the Commission in preparing the June 27, 2000 SRM. Therefore, we have not provided the proposed modified policy statement for additional public comment, since the only changes made were those already presented to the public and approved by the Commission.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection. The Office of the Chief Financial Officer has reviewed this Commission paper for resource implications and has no objections. The Office of the Chief Information Officer has reviewed the Commission Paper for information technology and information management implications and concurs in it. This paper was discussed with the ACRS at its December meeting. We have incorporated the suggestions made by the Committee at that meeting.

RESOURCES AND RECOMMENDATIONS:

The staff recommends that the revised Reactor Safety Goal Policy Statement be approved and published as a final Policy Statement in the *Federal Register*. The impact of any implementation issues should be minor since the revised policy statement reflects current practice. They will be considered through the normal Planning, Budgeting, and Performance Management process.

/RA/

William D. Travers
Executive Director
for Operations

Attachments:
1. Safety Goal Policy Statement - Clean Version
2. Safety Goal Policy Statement in Comparative Text

RESOURCES AND RECOMMENDATIONS:

The staff recommends that the revised Reactor Safety Goal Policy Statement be approved and published as a final Policy Statement in the *Federal Register*. The impact of any implementation issues should be minor since the revised policy statement reflects current practice. They will be considered through the normal Planning, Budgeting, and Performance Management process.

/RA/

William D. Travers
Executive Director
for Operations

Attachments:
1. Safety Goal Policy Statement - Clean Version
2. Safety Goal Policy Statement in Comparative Text

*See attached concurrence sheet.

DOCUMENT NAME:

OAR in ADAMS? (Y or N)____ ADAMS ACCESSION NO.: ML003779058 TEMPLATE NO. EDO-004
Publicly Available? (Y or N)___ DATE OF RELEASE TO PUBLIC _____ SENSITIVE? No

To receive a copy of this document, indicate in the box: "C" = Copy without enclosures **"E"** = Copy with enclosures **"N"** = No copy

OFC :RES		RES:TECH ED		RES:DRAA		RES:DDIR		RES:DIR	
NAME:JAMurphy:saf		ABeranek		TKing		MFederline		AThadani	
DATE:11/08/00*		12/19/00		11/ /00		11/08/00*		12/20/00	

OFC :NRR		OGC		CIO		CFO		DEDMRS	
NAME:SCollins - B. Sheron for		GMuzumo - no legal objection		SReiter - DGrimsley for		JFunches - TPullman for		CPaperiello	
DATE:11/19/00*		12/19/00		12/15/00 (e-mail)		12/14/00 (e-mail)		1/16/01	

OFC :EDO									
NAME:WTravers									
DATE:1/ 22 /00									

TO RECEIVE A COPY OF THIS DOCUMENT, INDICATE IN THE BOX "C" COPY WITHOUT ATTACHMENT; "E" COPY WITH ATTACHMENT; "N" NO COPY

OFFICIAL RECORD COPY

ATTACHMENT 1

Nuclear Regulatory Commission

10 CFR Part 50
Safety Goals for the Operation of Nuclear Power Plants; Policy Statement; Revision 1

SUMMARY:

This policy statement focuses on the risks to the public from nuclear power plant operation. Its objective is to establish goals that broadly define an acceptable level of radiological risk. In developing the policy statement, the NRC sponsored two public workshops during 1981, obtained public comments and held four public meetings during 1982, conducted a 2-year evaluation during 1983 to 1985, and received the views of its Advisory Committee on Reactor Safeguards. The modification to this policy statement was discussed in a public workshop in November 1999. This Revision 1 reflects Commission guidance given in Staff Requirements Memoranda dated June 15, 1990; June 30, 1998; October 28, 1999; and June 27, 2000, and incorporates the guidance that was provided after the original safety goal policy statement was issued. It reflects current practices that were previously approved by the Commission.

The Commission has established two qualitative safety goals which are supported by two quantitative objectives. These two supporting objectives are based on the principle that nuclear risks should not be a significant addition to other societal risks. The Commission wants to make clear that no death attributable to nuclear power plant operation will ever be "acceptable" in the sense that the Commission would regard it as a routine or permissible event. The Commission is discussing acceptable risks, not acceptable deaths. The safety goals are not limits, but goals. The Commission believes the staff should strive for a risk level consistent with the safety goals in developing or revising regulations. In developing and applying such new requirements to existing plants, the Backfit Rule should apply. Where new regulations are optional, the Backfit Rule does not apply since licensee actions are voluntary.

The qualitative safety goals are as follows:

- Individual members of the public should be provided a level of protection from the consequences of nuclear power plant operation such that individuals bear no significant additional risk to life and health.

- Societal risks to life and health from nuclear power plant operation should be comparable to or less than the risks of generating electricity by viable competing technologies and should not be a significant addition to other societal risks.

The following quantitative objectives are to be used in determining achievement of the above safety goals:

- The risk to an average individual in the vicinity of a nuclear power plant of prompt fatalities that might result from reactor accidents should not exceed one-tenth of

one percent (0.1 percent) of the sum of prompt fatality risks resulting from other accidents to which members of the U.S. population are generally exposed.

- The risk to the population in the area near a nuclear power plant of cancer fatalities that might result from nuclear power plant operation should not exceed one-tenth of one percent (0.1 percent) of the sum of cancer fatality risks resulting from all other causes.

EFFECTIVE DATE: **XXXX XX, XXXX**.

FOR FURTHER INFORMATION CONTACT:
Ashok Thadani, Director, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Telephone (301/415-6641).

SUPPLEMENTARY INFORMATION:

The following presents Revision 1 to the Commission's Policy Statement on Safety Goals for the Operation of Nuclear Power Plants:

I. Introduction

A. Purpose and Scope

In its response to the recommendations of the President's Commission on the Accident at Three Mile Island, the Nuclear Regulatory Commission (NRC) stated that it was "prepared to move forward with an explicit policy statement on safety philosophy and the role of safety-cost tradeoffs in the NRC safety decisions." This policy statement is the result.

Current regulatory practices are believed to ensure that the basic statutory requirement, adequate protection of the public, is met. Nevertheless, current practices could be improved to provide a better means for testing the adequacy of and need for current and proposed regulatory requirements. The Commission believes that such improvement could lead to a more coherent and consistent regulation of nuclear power plants, a more predictable regulatory process, a public understanding of the regulatory criteria that the NRC applies, and public confidence in the safety of operating plants. This statement of NRC safety policy expresses the Commission's views on the level of risks to public health and safety that the industry should strive for in its nuclear power plants. The safety goals are not limits, but goals. The Commission believes the staff should strive for a risk level consistent with the safety goals in developing or revising regulations. In developing and applying such new requirements to existing plants, the Backfit Rule should apply. Thus, the safety goals provide guidance on how far to go when proposing safety enhancements. Where new regulations are optional, the Backfit Rule does not apply since licensee actions are voluntary.

This policy statement focuses on the risks to the public from nuclear power plant operation. These are the risks from release of radioactive materials from the reactor to the environment from normal operations as well as from accidents. The Commission will refer to these risks as the risks of nuclear power plant operation. The risks from the nuclear fuel cycle are not included in the safety goals.

These fuel cycle risks have been considered in their own right and determined to be quite small. They will continue to receive careful consideration, The possible effects of sabotage or diversion of nuclear material are also not presently included in the safety goals. At present there is no basis on which to provide a measure of risk on these matters. It is the Commission's intention that everything that is needed will be done to keep these types of risks at their present very low level; and it is the Commission's expectation that efforts on this point will continue to be successful. With these exceptions, it is the Commission's intent that the risks from all the various initiating mechanisms be taken into account to the best of the capability of current evaluation techniques.

In the evaluation of nuclear power plant operation, the staff considers several types of releases. Current NRC practice addresses the risks to the public resulting from operating nuclear power plants. Before a nuclear power plant is licensed to operate, NRC prepares an environmental impact assessment which includes an evaluation of the radiological impacts of routine operation of the plant and accidents on the population in the region around the plant site. The assessment undergoes public comment and may be extensively probed in adjudicatory hearings. For all plants licensed to operate, NRC has found that there will be no measurable radiological impact on any member of the public from routine operation of the plant. (Reference: NRC staff calculations of radiological impact on humans contained in Final Environmental Statements for specific nuclear power plants: e.g., NUREG-0779, NUREG-0812, and NUREG-0854.) These environmental impact assessments evaluate the overall environmental impact. The NRC will continue to consider the need to minimize adverse environmental impacts in its regulatory decision-making.

The objective of the Commission's policy statement is to establish goals that broadly define an acceptable level of radiological risk that might be imposed on the public as a result of nuclear power plant operation. While this policy statement includes the risks of normal operation. as well as accidents, the Commission believes that because of compliance with Federal Radiation Council (FRC) guidance, (40 CFR Part 190), and NRC's regulations (10 CFR Part 20 and Appendix I to Part 50), the risks from routine emissions are small compared to the safety goals. Therefore, the Commission believes that these risks need not be routinely analyzed on a case-by~case basis in order to demonstrate conformance with the safety goals.

B. Development of the Policy Statement on Safety Goals

In developing the policy statement, the Commission solicited and benefitted from the information and suggestions provided by workshop discussions. NRC-sponsored workshops were held in Palo Alto, California, on April 1-3, 1981 and in Harpers Ferry, West Virginia, on July 23-24, 1981. The first workshop addressed general issues involved in developing safety goals. The second workshop focused on a discussion paper which presented proposed safety goals. Both workshops featured discussions among knowledgeable persons drawn from industry, public interest groups, universities, and elsewhere, who represented a broad range of perspectives and disciplines.

The NRC Office of Policy Evaluation submitted to the Commission for its consideration a Discussion Paper on Safety Goals for Nuclear Power Plants in November 1981 and a revised safety goal report in July 1982. The Commission also took into consideration the comments

and suggestions received from the public in response to the proposed Policy Statement on "Safety Goals for Nuclear Power Plants." published on February 17, 1982 (47 FR 7023). Following public comment, a revised Policy Statement was issued on March 14, 1983 (48 FR 10772) and a 2-year evaluation period began.

The Commission used the staff report and its recommendations that resulted from the 2-year evaluation of safety goals in developing this [final] Policy Statement. Additionally, the Commission had benefit of further comments from its Advisory Committee on Reactor Safeguards (ACRS) and by senior NRC management. Based on the results of this information, the Commission determined that the qualitative safety goals would remain unchanged from its March 1983 revised policy statement, and the Commission adopted these as its safety goals for the operation of nuclear power plants.

As the use of risk information in regulatory activities has expanded, the Commission has provided additional guidance on its use and on the interpretation of the safety goals. The Commission decided to revise the safety goal policy statement to incorporate this later guidance. The modification to this policy statement was discussed in a public workshop in November 1999. This revision reflects Commission guidance given in Staff Requirement Memoranda dated June 15, 1990; June 30, 1998; October 28, 1999; and June 27, 2000.

II. Qualitative Safety Goals

The Commission has decided to adopt qualitative safety goals that are supported by quantitative health effects objectives for use in the regulatory decision-making process. The Commission's first qualitative safety goal is that the risk from nuclear power plant operation should not be a significant contributor to a person's risk of accidental death or injury. The intent is to require such a level of safety that individuals living or working near nuclear power plants should be able to go about their daily lives without special concern by virtue of their proximity to these plants. Thus, the Commission's first safety goal is--

> *Individual members of the public should be provided a level of protection from the consequences of nuclear power plant operation such that individuals bear no significant additional risk to life and health.*

Even though protection of individual members of the public inherently provides substantial societal protection, the Commission also decided that a limit should be placed on the societal risks posed by nuclear power plant operation. The Commission also believes that the risks of nuclear power plant operation should be comparable to or less than the risks from other viable means of generating the same quantity of electrical energy. Thus, the Commission's second safety goal is--

> *Societal risks to life and health from nuclear power plant operation should be comparable to or less than the risks of generating electricity by viable competing technologies and should not be a significant addition to other societal risks.*

The Commission has established the quantitative health effects objectives in such a way that nuclear risks are not a significant addition to other societal risks.

Severe core damage accidents can lead to more serious accidents with the potential for life-threatening offsite release of radiation, for evacuation of members of the public. and for contamination of public property. Apart from their health and safety consequences, severe core damage accidents can erode public confidence in the safety of nuclear power and can lead to further instability and unpredictability for the industry. In order to avoid these adverse consequences, the Commission intends to continue to pursue a regulatory program that has as its objective providing reasonable assurance, while giving appropriate consideration to the uncertainties involved, that a severe core-damage accident will not occur at a U.S. nuclear power plant.

III. Quantitative Objectives Used To Gauge Achievement of The Safety Goals

A. General Considerations

The quantitative health effects objectives establish NRC guidance for public protection which nuclear plant designers and operators should strive to achieve. A key element in formulating a qualitative safety goal whose achievement is measured by quantitative health effects objectives is to understand both the strengths and limitations of the techniques by which one judges whether the qualitative safety goal has been met.

A major step forward in the development and refinement-of accident risk quantification was taken in the Reactor Safety Study (WASH-1400) completed in 1975. The objective of the Study was "to try to reach some meaningful conclusions about the risk of nuclear accidents." The Study did not directly address the question of what level of risk from nuclear accidents was acceptable.

Since the completion of the Reactor Safety Study, further progress in developing probabilistic risk assessment and in accumulating relevant data has led to a recognition that it is feasible to use quantitative safety objectives. However, because of the sizeable uncertainties still present in the methods and the gaps in the database-essential elements needed to gauge whether the objectives have been achieved-the quantitative objectives should be viewed as aiming points or numerical benchmarks of performance. In particular, because of the present limitations in the state of the art of quantitatively estimating risks, the quantitative health effects objectives are not a substitute for existing regulations.

The Commission recognizes the importance of mitigating the consequences of a core-melt accident and continues to emphasize features such as containment, siting in less populated areas, and emergency planning as integral parts of the defense-in-depth concept associated with its accident prevention and mitigation philosophy.

B. Quantitative Risk Objectives

The Commission wants to make clear at the beginning of this section that no death attributable to nuclear power plant operation will ever be "acceptable" in the sense that the Commission would regard it as a routine or permissible event. We are discussing acceptable risks, not acceptable deaths. In any fatal accident, a course of conduct posing an acceptable risk at one moment results in an unacceptable death moments later. This is true whether one speaks of driving, swimming, flying or generating electricity from coal. Each of these activities poses a

calculable risk to society and to individuals. Some of those who accept the risk (or are part of a society that accepts risk) do not survive it. We intend that no such accidents will occur, but the possibility cannot be entirely eliminated. Furthermore, individual and societal risks from nuclear power plants are generally estimated to be considerably less than the risk that society is now exposed to from each of the other activities mentioned above.

C. Health Effects--Prompt and Latent Cancer Mortality Risks

The Commission has decided to adopt the following two health effects as the quantitative objectives concerning mortality risks to be used in determining achievement of the qualitative safety goals--

- The risk to an average individual in the vicinity of a nuclear power plant of prompt fatalities that might result from reactor accidents should not exceed one-tenth of one percent (0.1 percent) of the sum of prompt fatality risks resulting from other accidents to which members of the U.S. population are generally exposed.

- The risk to the population in the area near a nuclear power plant of cancer fatalities that might result from nuclear power plant operation should not exceed one-tenth of one percent (0.1 percent) of the sum of cancer fatality risks resulting from all other causes.

The Commission believes that this ratio of 0.1 percent appropriately reflects both of the qualitative goals--to provide that individuals and society bear no significant additional risk. However, this does not necessarily mean that an additional risk that exceeds 0.1 percent would by itself constitute a significant additional risk. The 0.1 percent ratio to other risks is low enough to support an expectation that people living or working near nuclear power plants would have no special concern due to the plant's proximity.

The average individual in the vicinity of the plant is defined as the average individual biologically (in terms of age and other risk factors) and locationally who resides within a mile from the plant site boundary. This means that the average individual is found by accumulating the estimated individual risks and dividing by the number of individuals residing in the vicinity of the plant. In applying the objective for individual risk of prompt fatality, the Commission has defined the vicinity as the area within 1 mile of the nuclear power plant site boundary, since calculations of the consequences of major reactor accidents suggest that individuals within a mile of the plant site boundary would generally be subject to the greatest risk of prompt death attributable to radiological causes. If there are no individuals residing within a mile of the plant boundary, an individual should, for evaluation purposes, be assumed to reside 1 mile from the site boundary. In applying the objective for cancer fatalities as a population guideline for individuals in the area near the plant, the Commission has defined the population generally considered subject to significant risk as the population within 10 miles of the plant site. The bulk of significant exposures of the population to radiation would be concentrated within this distance, and thus this is the appropriate population for comparison with cancer fatality risks from all other causes. This objective would ensure that the estimated increase in the risk of delayed cancer fatalities from all potential radiation releases at a typical plant would be no more than a small fraction of the year-to-year normal variation in the expected cancer deaths from nonnuclear causes. Moreover, the prompt fatality objective for protecting individuals generally provides even greater protection to the population as a whole. That is, if the quantitative objective for prompt fatality is

met for individuals in the immediate vicinity of the plant, the estimated risk of delayed cancer fatality to persons within 10 miles of the plant and beyond would generally be much lower than the quantitative objective for cancer fatality. Thus, compliance with the prompt fatality objective applied to individuals close to the plant would generally mean that the aggregate estimated societal risk would be a number of times lower than it would be if compliance with just the objective applied to the population as a whole were involved. The distance for averaging the cancer fatality risk was taken as 50 miles in the 1983 policy statement. The change to 10 miles could be viewed to provide additional protection to individuals in the vicinity of the plant, although analyses indicate that this objective for cancer fatality will not be the controlling one. It also provides more representative societal protection, since the risk to the people beyond 10 miles will be less than the risk to the people within 10 miles.

D. Useful Surrogate Subsidiary Objectives

Because of the complexity of performing risk analyses in which public health risks (early and latent fatalities) are evaluated, and the uncertainties associated with such evaluations, the Commission observes that implementation of the safety goals using subsidiary objectives that achieve the same intent as the quantitative health objectives, but do not involve as much complexity, can be useful in making regulatory decisions. These subsidiary objectives anchor, or provide guidance, on an appropriate defense-in-depth philosophy that balances accident prevention and mitigation. In this light, a core damage frequency of less than 1 in 10,000 per year of reactor operation is a very useful subsidiary benchmark in making judgments about that portion of our regulations that are directed to accident prevention. Similarly, a large early release frequency of less than 1 in 100,000 years is a useful subsidiary benchmark to help ensure a proper balance between prevention and mitigation.

IV. Treatment of Uncertainties

The Commission is aware that uncertainties are not caused by use of quantitative methodology in decision-making but are merely highlighted through use of the quantification process. Confidence in the use of probabilistic and risk assessment techniques has steadily improved since the time these were used in the Reactor Safety Study. Since quantitative methods provide a means for evaluating the significance of uncertainties**,** important uncertainties have been and continue to be brought into better focus and may even be reduced compared to those that would remain with sole reliance on deterministic decision-making. To the extent practicable, the Commission intends to ensure that the quantitative techniques used for regulatory decision-making take into account the potential uncertainties that exist so that an estimate can be made on the confidence level to be ascribed to the quantitative results. There are facets to uncertainty that, because of their nature, must be treated differently when creating models of complex systems. Because they are generally characterized and treated differently, it is useful to identify three classes of uncertainty that are addressed in and impact the results of PRAs: parameter uncertainty, model uncertainty, and completeness uncertainty. Parameter uncertainties are those associated with the values of the fundamental parameters of the PRA model, such as equipment failure rates, initiating event frequencies, and human error probabilities that are used in the quantification of the accident sequence frequencies. The development of the PRA model is supported by the use of models for specific events or phenomena. In many cases, the industry's state of knowledge is incomplete or the model may be simplified to facilitate use, and there may be different opinions on how the models should be

formulated. Examples include approaches to modeling human performance, common cause failures, and reactor coolant pump seal behavior upon loss of seal cooling. This gives rise to model uncertainty. Completeness uncertainty is an aspect of model uncertainty, but because of its importance it is referenced here. Completeness is a reflection of scope limitations. These facets of uncertainty result in an uncertainty about where the true risk lies. All types of uncertainty should be considered.

The Commission has adopted the use of mean estimates for purposes of implementing the quantitative objectives of this safety goal policy (i.e., the mortality risk objectives). Use of the mean estimates comports with the customary practices for cost-benefit analyses and it is the correct usage for purposes of the mortality risk comparisons. Use of mean estimates requires the quantification (to the extent reasonable) and understanding of those important uncertainties involved in the reactor accident risk predictions. A number of uncertainties (e.g., thermal-hydraulic assumptions and the phenomenology of core-melt progression, fission product release and transport, and containment loads and performance) arise because of a direct lack of severe accident experience or knowledge of accident phenomenology along with data related to probability distributions.

In such a situation, it is necessary that proper attention be given not only to the range and distribution of uncertainty surrounding probabilistic estimates, but also to the phenomenology that most influences the uncertainties. For this reason, sensitivity studies should be performed to determine those uncertainties most important to the probabilistic estimates. The results of sensitivity of studies should be displayed showing, for example, the range of variation together with the underlying science or engineering assumptions that dominate this variation. Depending on the decision needs, the probabilistic results should also be reasonably balanced and supported through use of deterministic arguments**,** defense-in-depth considerations, maintenance of safety margins, and performance measurement strategies. In this way, judgements can be made by the decision maker about the degree of confidence to be given to these estimates and assumptions. This is a key part of the process of determining the degree of regulatory conservatism that may be warranted for particular decisions. This defense-in-depth approach is expected to continue to ensure the protection of public health and safety.

V. Guidelines For Regulatory Implementation

The Commission approves use of the qualitative safety goals, including use of the quantitative health effects objectives in the regulatory decisionmaking process on both plant-specific and generic bases. The Commission recognizes that the safety goal can provide a useful tool by which the adequacy of regulations or regulatory decisions regarding changes to the regulations can be judged. Likewise, the safety goals could be of benefit in the task of assessing whether existing plants, designed, constructed and operated to comply with past and current regulations, conform adequately with the intent of the safety goal policy.

To provide adequate protection of the public health and safety, current NRC regulations require conservatism in design, construction, testing, operation and maintenance of nuclear power plants. A defense-in-depth approach has been mandated in order to prevent accidents from happening and to mitigate their consequences. Siting in less populated areas is emphasized. Furthermore, emergency response capabilities are mandated to provide additional

defense-in-depth protection to the surrounding population. Risk insights can make the elements of defense-in-depth more clear by quantifying them to the extent practicable. Although the uncertainties associated with the importance of some elements of defense may be substantial, the fact that these elements and uncertainties have been quantified can aid in determining how much defense makes regulatory sense. Decisions on the adequacy of or the necessity for elements of defense should reflect risk insights gained through identification of the individual performance of each defense system in relation to overall performance.

Application of the safety goals requires an integrated approach to regulation. In addition to consideration of the qualitative and quantitative goals, all safety impacts must be considered as part of the overall risk management approach to maintaining or reducing risk. Supporting analyses should be based on the as-built and as-operated and -maintained plant, and they should reflect operating experience and be subjected to quality controls. Uncertainties must be considered explicitly in both the supporting analyses and in the interpretation of the results. Defense in depth is mandated, as stated above, and safety margins must be sufficient to account for parameter, modeling, and completeness uncertainties. Data, methods, and assessment criteria used to support regulatory decision-making must be well documented and available for public review. If safety goal considerations are used to develop regulatory changes that could lead to an increase in core damage or large early release frequencies, such increases should be small. Such a limitation would avoid the potential for approving regulatory changes that, upon implementation, could be rescinded by the NRC on the basis that rescinding the change would constitute a “substantial increase” in protection to public health and safety under the Backfit Rule.

These safety goals and these implementation guidelines are not meant as a substitute for NRC's regulations and do not relieve nuclear power plant permittees and licensees from complying with regulations. Nor are the safety goals and these implementation guidelines in and of themselves meant to serve as a sole basis for licensing decisions. However, if pursuant to these guidelines, information is developed that is applicable to a particular licensing decision, it may be considered as one factor in the licensing decision.

Dated at Washington, DC, this ___ of _____, 2001.
For the Nuclear Regulatory Commission.

Richard A. Meserve, Chairman.

ATTACHMENT 2

Proposed Changes
Deletions in brackets [ ], new material in **bold.**

Proposed Changes
Deletions in brackets [ ], new material in **bold.**

Nuclear Regulatory Commission

10 CFR Part 50

Safety Goals for the Operation of Nuclear Power Plants; Policy Statement; Modification and Re-publication

SUMMARY:

This policy statement focuses on the risks to the public from nuclear power plant operation. Its objective is to establish goals that broadly define an acceptable level of radiological risk. In developing the policy statement, the NRC sponsored two public workshops during 1981, obtained public comments and held four public meetings during 1982, conducted a 2-year evaluation during 1983 to 1985, and received the views of its Advisory Committee on Reactor Safeguards. **The modification to this policy statement was discussed in a public workshop in November 1999. This Revision 1 reflects Commission guidance given in Staff Requirements Memoranda dated June 15, 1990; June 30, 1998; October 28, 1999; and June 27, 2000, and incorporates the guidance that was provided after the original safety goal policy statement was issued. It reflects current practices that were previously approved by the Commission**.

The Commission has established two qualitative safety goals which are supported by two quantitative objectives. These two supporting objectives are based on the principle that nuclear risks should not be a significant addition to other societal risks. The Commission wants to make clear that no death attributable to nuclear power plant operation will ever be "acceptable" in the sense that the Commission would regard it as a routine or permissible event. The Commission is discussing acceptable risks, not acceptable deaths. **The safety goals are not limits, but goals. The Commission believes the staff should strive for a risk level consistent with the safety goals in developing or revising regulations. In developing and applying such new requirements to existing plants, the Backfit Rule should apply**.[1] **Where new regulations are optional, the Backfit Rule does not apply since licensee actions are voluntary.**

The qualitative safety goals are as follows:

- Individual members of the public should be provided a level of protection from the consequences of nuclear power plant operation such that individuals bear no significant additional risk to life and health.

- Societal risks to life and health from nuclear power plant operation should be comparable to or less than the risks of generating electricity by viable competing technologies and should not be a significant addition to other societal risks.

The following quantitative objectives are to be used in determining achievement of the above safety goals:

- The risk to an average individual in the vicinity of a nuclear power plant of prompt fatalities that might result from reactor accidents should not exceed one-tenth of one percent (0.1 percent) of the sum of prompt fatality risks resulting from other accidents to which members of the U.S. population are generally exposed.

- The risk to the population in the area near a nuclear power plant of cancer fatalities that might result from nuclear power plant operation should not exceed one-tenth of one percent (0.1 percent) of the sum of cancer fatality risks resulting from all other causes.

EFFECTIVE DATE: **XXXX XX, XXXX**.

FOR FURTHER INFORMATION CONTACT:
Ashok Thadani, Director, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Telephone (301/415-6641).

SUPPLEMENTARY INFORMATION:

The following presents **Revision 1 to** the Commission's **[**Final**]** Policy Statement on Safety Goals for the Operation of Nuclear Power Plants:

I. Introduction

A. Purpose and Scope

In its response to the recommendations of the President's Commission on the Accident at Three Mile Island, the Nuclear Regulatory Commission (NRC) stated that it was "prepared to move forward with an explicit policy statement on safety philosophy and the role of safety-cost tradeoffs in the NRC safety decisions." This policy statement is the result.

Current regulatory practices are believed to ensure that the basic statutory requirement, adequate protection of the public, is met. Nevertheless, current practices could be improved to provide a better means for testing the adequacy of and need for current and proposed regulatory requirements. The Commission believes that such improvement could lead to a more coherent and consistent regulation of nuclear power plants, a more predictable regulatory process, a public understanding of the regulatory criteria that the NRC applies, and public confidence in the safety of operating plants. This statement of NRC safety policy expresses the Commission's views on the level of risks to public health and safety that the industry should strive for in its nuclear power plants. **The safety goals are not limits, but goals. The Commission believes the staff should strive for a risk level consistent with the safety goals in developing or revising regulations. In developing and applying such new**

requirements to existing plants, the Backfit Rule should apply. Thus, the safety goals provide guidance on how far to go when proposing safety enhancements.[2] **Where new regulations are optional, the Backfit Rule does not apply since licensee actions are voluntary.**

This policy statement focuses on the risks to the public from nuclear power plant operation. These are the risks from release of radioactive materials from the reactor to the environment from normal operations as well as from accidents. The Commission will refer to these risks as the risks of nuclear power plant operation. The risks from the nuclear fuel cycle are not included in the safety goals.

These fuel cycle risks have been considered in their own right and determined to be quite small. They will continue to receive careful consideration, The possible effects of sabotage or diversion of nuclear material are also not presently included in the safety goals. At present there is no basis on which to provide a measure of risk on these matters. It is the Commission's intention that everything that is needed will be done to keep these types of risks at their present very low level; and it is the Commission's expectation that efforts on this point will continue to be successful. With these exceptions, it is the Commission's intent that the risks from all the various initiating mechanisms be taken into account to the best of the capability of current evaluation techniques.

In the evaluation of nuclear power plant operation, the staff considers several types of releases. Current NRC practice addresses the risks to the public resulting from operating nuclear power plants. Before a nuclear power plant is licensed to operate, NRC prepares an environmental impact assessment which includes an evaluation of the radiological impacts of routine operation of the plant and accidents on the population in the region around the plant site. The assessment undergoes public comment and may be extensively probed in adjudicatory hearings. For all plants licensed to operate, NRC has found that there will be no measurable radiological impact on any member of the public from routine operation of the plant. (Reference: NRC staff calculations of radiological impact on humans contained in Final Environmental Statements for specific nuclear power plants: e.g., NUREG-0779, NUREG-0812, and NUREG-0854.) **These environmental impact assessments evaluate the overall environmental impact. The NRC will continue to consider the need to minimize adverse environmental impacts in its regulatory decision-making**.[3]

The objective of the Commission's policy statement is to establish goals that broadly define an acceptable level of radiological risk that might be imposed on the public as a result of nuclear power plant operation. While this policy statement includes the risks of normal operation. as well as accidents, the Commission believes that because of compliance with Federal Radiation Council (FRC) guidance, (40 CFR Part 190), and NRC's regulations (10 CFR Part 20 and Appendix I to Part 50), the risks from routine emissions are small compared to the safety goals. Therefore, the Commission believes that these risks need not be routinely analyzed on a case-by~case basis in order to demonstrate conformance with the safety goals.

B. Development of this Statement of Safety Policy

In developing the policy statement, the Commission solicited and benefitted from the information and suggestions provided by workshop discussions. NRC-sponsored workshops

were held in Palo Alto, California, on April 1-3, 1981 and in Harpers Ferry, West Virginia, on July 23-24, 1981. The first workshop addressed general issues involved in developing safety goals. The second workshop focused on a discussion paper which presented proposed safety goals. Both workshops featured discussions among knowledgeable persons drawn from industry, public interest groups, universities, and elsewhere, who represented a broad range of perspectives and disciplines.

The NRC Office of Policy Evaluation submitted to the Commission for its consideration a Discussion Paper on Safety Goals for Nuclear Power Plants in November 1981 and a revised safety goal report in July 1982
.
The Commission also took into consideration the comments and suggestions received from the public in response to the proposed Policy Statement on "Safety Goals for Nuclear Power Plants." published on February 17, 1982 (47 FR 7023). Following public comment, a revised Policy Statement was issued on March 14, 1983 (48 FR 10772) and a 2-year evaluation period began.

The Commission used the staff report and its recommendations that resulted from the 2-year evaluation of safety goals in developing this [final] Policy Statement. Additionally, the Commission had benefit of further comments from its Advisory Committee on Reactor Safeguards (ACRS) and by senior NRC management.

Based on the results of this information, the Commission determined that the qualitative safety goals **would [**will**]** remain unchanged from its March 1983 revised policy statement, and the Commission adopt**ed** these as its safety goals for the operation of nuclear power plants.

As the use of risk information in regulatory activities has expanded, the Commission has provided additional guidance on its use and on the interpretation of the safety goals. The Commission decided to revise the safety goal policy statement to incorporate this later guidance. The modification to this policy statement was discussed in a public workshop in November 1999. This revision reflects Commission guidance given in Staff Requirement Memoranda dated June 15, 1990; June 30, 1998; October 28, 1999; and June 27, 2000.

II. Qualitative Safety Goals

The Commission has decided to adopt qualitative safety goals that are supported by quantitative health effects objectives for use in the regulatory decisionmaking process. The Commission's first qualitative safety goal is that the risk from nuclear power plant operation should not be a significant contributor to a person's risk of accidental death or injury. The intent is to require such a level of safety that individuals living or working near nuclear power plants should be able to go about their daily lives without special concern by virtue of their proximity to these plants. Thus, the Commission's first safety goal is--

> *Individual members of the public should be provided a level of protection from the consequences of nuclear power plant operation such that individuals bear no significant additional risk to life and health.*

Even though protection of individual members of the public inherently provides substantial societal protection, the Commission also decided that a limit should be placed on the societal risks posed by nuclear power plant operation. The Commission also believes that the risks of nuclear power plant operation should be comparable to or less than the risks from other viable means of generating the same quantity of electrical energy. Thus, the Commission's second safety goal is--

> *Societal risks to life and health from nuclear power plant operation should be comparable to or less than the risks of generating electricity by viable competing technologies and should not be a significant addition to other societal risks.*

[The broad spectrum of expert opinion on the risks posed by electrical generation by coal and the absence of authoritative data make it impractical to calibrate nuclear safety goals by comparing them with coal risks based on what we know today. However, t**] T**he Commission has established the quantitative health effects objectives in such a way that nuclear risks are not a significant addition to other societal risks.

Severe core damage accidents can lead to more serious accidents with the potential for life-threatening offsite release of radiation, for evacuation of members of the public. and for contamination of public property. Apart from their health and safety consequences, severe core damage accidents can erode public confidence in the safety of nuclear power and can lead to further instability and unpredictability for the industry. In order to avoid these adverse consequences, the Commission intends to continue to pursue a regulatory program that has as its objective providing reasonable assurance, while giving appropriate consideration to the uncertainties involved, that a severe core-damage accident will not occur at a U.S. nuclear power plant.

III. Quantitative Objectives Used To Gauge Achievement of The Safety Goals

A. General Considerations

The quantitative health effects objectives establish NRC guidance for public protection which nuclear plant designers and operators should strive to achieve. A key element in formulating a qualitative safety goal whose achievement is measured by quantitative health effects objectives is to understand both the strengths and limitations of the techniques by which one judges whether the qualitative safety goal has been met.

A major step forward in the development and refinement-of accident risk quantification was taken in the Reactor Safety Study (WASH-1400) completed in 1975. The objective of the Study was "to try to reach some meaningful conclusions about the risk of nuclear accidents." The Study did not directly address the question of what level of risk from nuclear accidents was acceptable.

Since the completion of the Reactor Safety Study, further progress in developing probabilistic risk assessment and in accumulating relevant data has led to a recognition that it is feasible to **[**begin to**]** use quantitative safety objectives**[** for limited purposes**]**. However, because of the sizeable uncertainties still present in the methods and the gaps in the database-essential elements needed to gauge whether the objectives have been achieved-the quantitative

objectives should be viewed as aiming points or numerical benchmarks of performance. In particular, because of the present limitations in the state of the art of quantitatively estimating risks, the quantitative health effects objectives are not a substitute for existing regulations.

The Commission recognizes the importance of mitigating the consequences of a core-melt accident and continues to emphasize features such as containment, siting in less populated areas, and emergency planning as integral parts of the defense-in-depth concept associated with its accident prevention and mitigation philosophy.

B. Quantitative Risk Objectives

The Commission wants to make clear at the beginning of this section that no death attributable to nuclear power plant operation will ever be "acceptable" in the sense that the Commission would regard it as a routine or permissible event. We are discussing acceptable risks, not acceptable deaths. In any fatal accident, a course of conduct posing an acceptable risk at one moment results in an unacceptable death moments later. This is true whether one speaks of driving, swimming, flying or generating electricity from coal. Each of these activities poses a calculable risk to society and to individuals. Some of those who accept the risk (or are part of a society that accepts risk) do not survive it. We intend that no such accidents will occur, but the possibility cannot be entirely eliminated. Furthermore, individual and societal risks from nuclear power plants are generally estimated to be considerably less than the risk that society is now exposed to from each of the other activities mentioned above.

C. Health Effects--Prompt and Latent Cancer Mortality Risks

The Commission has decided to adopt the following two health effects as the quantitative objectives concerning mortality risks to be used in determining achievement of the qualitative safety goals--

- The risk to an average individual in the vicinity of a nuclear power plant of prompt fatalities that might result from reactor accidents should not exceed one-tenth of one percent (0.1 percent) of the sum of prompt fatality risks resulting from other accidents to which members of the U.S. population are generally exposed.

- The risk to the population in the area near a nuclear power plant of cancer fatalities that might result from nuclear power plant operation should not exceed one-tenth of one percent (0.1 percent) of the sum of cancer fatality risks resulting from all other causes.

The Commission believes that this ratio of 0.1 percent appropriately reflects both of the qualitative goals--to provide that individuals and society bear no significant additional risk. However, this does not necessarily mean that an additional risk that exceeds 0.1 percent would by itself constitute a significant additional risk. The 0.1 percent ratio to other risks is low enough to support an expectation that people living or working near nuclear power plants would have no special concern due to the plant's proximity.

The average individual in the vicinity of the plant is defined as the average individual biologically (in terms of age and other risk factors) and locationally who resides within a mile from the plant

site boundary. This means that the average individual is found by accumulating the estimated individual risks and dividing by the number of individuals residing in the vicinity of the plant. In applying the objective for individual risk of prompt fatality, the Commission has defined the vicinity as the area within 1 mile of the nuclear power plant site boundary, since calculations of the consequences of major reactor accidents suggest that individuals within a mile of the plant site boundary would generally be subject to the greatest risk of prompt death attributable to radiological causes. If there are no individuals residing within a mile of the plant boundary, an individual should, for evaluation purposes, be assumed to reside 1 mile from the site boundary. In applying the objective for cancer fatalities as a population guideline for individuals in the area near the plant, the Commission has defined the population generally considered subject to significant risk as the population within 10 miles of the plant site. The bulk of significant exposures of the population to radiation would be concentrated within this distance, and thus this is the appropriate population for comparison with cancer fatality risks from all other causes. This objective would ensure that the estimated increase in the risk of delayed cancer fatalities from all potential radiation releases at a typical plant would be no more than a small fraction of the year-to-year normal variation in the expected cancer deaths from nonnuclear causes. Moreover, the prompt fatality objective for protecting individuals generally provides even greater protection to the population as a whole. That is, if the quantitative objective for prompt fatality is met for individuals in the immediate vicinity of the plant, the estimated risk of delayed cancer fatality to persons within 10 miles of the plant and beyond would generally be much lower than the quantitative objective for cancer fatality. Thus, compliance with the prompt fatality objective applied to individuals close to the plant would generally mean that the aggregate estimated societal risk would be a number of times lower than it would be if compliance with just the objective applied to the population as a whole were involved. The distance for averaging the cancer fatality risk was taken as 50 miles in the 1983 policy statement. The change to 10 miles could be viewed to provide additional protection to individuals in the vicinity of the plant, although analyses indicate that this objective for cancer fatality will not be the controlling one. It also provides more representative societal protection, since the risk to the people beyond 10 miles will be less than the risk to the people within 10 miles.

D. Useful Surrogate Subsidiary Objectives

Because of the complexity of performing risk analyses in which public health risks (early and latent fatalities) are evaluated, and the uncertainties associated with such evaluations, the Commission observes that implementation of the safety goals using subsidiary objectives that achieve the same intent as the quantitative health objectives, but do not involve as much complexity, can be useful in making regulatory decisions. These subsidiary objectives anchor, or provide guidance, on an appropriate defense-in-depth philosophy that balances accident prevention and mitigation. In this light, a core damage frequency of less than 1 in 10,000 per year of reactor operation is a very useful subsidiary benchmark in making judgments about that portion of our regulations that are directed to accident prevention. Similarly, a large early release frequency of less than 1 in 100,000 years is a useful subsidiary benchmark to help ensure a proper balance between prevention and mitigation. [4]

IV. Treatment of Uncertainties

The Commission is aware that uncertainties are not caused by use of quantitative methodology in decisionmaking but are merely highlighted through use of the quantification process. Confidence in the use of probabilistic and risk assessment techniques has steadily improved since the time these were used in the Reactor Safety Study. **Since quantitative methods provide a means for evaluating the significance of uncertainties, [**In fact, through use of quantitative techniques**]**, important uncertainties have been and continue to be brought into better focus and may even be reduced compared to those that would remain with sole reliance on deterministic decisionmaking. To the extent practicable, the Commission intends to ensure that the quantitative techniques used for regulatory decisionmaking take into account the potential uncertainties that exist so that an estimate can be made on the confidence level to be ascribed to the quantitative results. **There are facets to uncertainty that, because of their natures, must be treated differently when creating models of complex systems. Because they are generally characterized and treated differently, it is useful to identify three classes of uncertainty that are addressed in and impact the results of PRAs: parameter uncertainty, model uncertainty, and completeness uncertainty. Parameter uncertainties are those associated with the values of the fundamental parameters of the PRA model, such as equipment failure rates, initiating event frequencies, and human error probabilities that are used in the quantification of the accident sequence frequencies. The development of the PRA model is supported by the use of models for specific events or phenomena. In many cases, the industry's state of knowledge is incomplete or the model may be simplified to facilitate use, and there may be different opinions on how the models should be formulated. Examples include approaches to modeling human performance, common cause failures, and reactor coolant pump seal behavior upon loss of seal cooling. This gives rise to model uncertainty. [5] Completeness uncertainty is an aspect of model uncertainty, but because of its importance it is referenced here. Completeness is a reflection of scope limitations. These facets of uncertainty result in an uncertainty about where the true risk lies. [6] All types of uncertainty should considered.**

The Commission has adopted the use of mean estimates for purposes of implementing the quantitative objectives of this safety goal policy (i.e., the mortality risk objectives). Use of the mean estimates comports with the customary practices for cost-benefit analyses and it is the correct usage for purposes of the mortality risk comparisons. Use of mean estimates **[**does not however resolve**] requires** the **[**need to**] quantif[**y**]ication** (to the extent reasonable) and understand**ing of** those important uncertainties involved in the reactor accident risk predictions. A number of uncertainties (e.g., thermal-hydraulic assumptions and the phenomenology of core-melt progression, fission product release and transport, and containment loads and performance) arise because of a direct lack of severe accident experience or knowledge of accident phenomenology along with data related to probability distributions.

In such a situation, it is necessary that proper attention be given not only to the range **and distribution** of uncertainty surrounding probabilistic estimates, but also to the phenomenology that most influences the uncertainties. For this reason, sensitivity studies should be performed to determine those uncertainties most important to the probabilistic estimates. The results of sensitivity of studies should be displayed showing, for example, the range of variation together

with the underlying science or engineering assumptions that dominate this variation. Depending on the decision needs, the probabilistic results should also be reasonably balanced and supported through use of deterministic arguments**, defense-in-depth considerations, maintenance of safety margins, and performance measurement strategies**. In this way, judgements can be made by the decision maker about the degree of confidence to be given to these estimates and assumptions. This is a key part of the process of determining the degree of regulatory conservatism that may be warranted for particular decisions. This defense-in-depth approach is expected to continue to ensure the protection of public health and safety.

V. Guidelines For Regulatory Implementation

The Commission approves use of the qualitative safety goals, including use of the quantitative health effects objectives in the regulatory decisionmaking process **on both plant-specific and generic bases**. The Commission recognizes that the safety goal can provide a useful tool by which the adequacy of regulations or regulatory decisions regarding changes to the regulations can be judged. Likewise, the safety goals could be of benefit in the **[**much more difficult**]** task of assessing whether existing plants, designed, constructed and operated to comply with past and current regulations, conform adequately with the intent of the safety goal policy.

Delete text in brackets below:

[However, in order to do this, the staff will require specific guidelines to use as a basis for determining whether a level of safety ascribed to a plant is consistent with the safety goal policy. As a separate matter, the Commission Intends to review and approve guidance to the staff regarding such determinations. It is currently envisioned that this guidance would address matters such as plant performance guidelines, indicators for operational performance, and guidelines for conduct of cost-benefit analyses. This guidance would be derived from additional studies conducted by the staff and resulting in recommendations to the Commission. The guidance would be based on the following general performance guideline which is proposed by the Commission for further staff examination--

> *Consistent with the traditional defense-in-depth approach and the accident mitigation philosophy requiring reliable performance of containment systems, the overall mean frequency of a large release of radioactive materials to the environment from a reactor accident should be less than 1 in 1,000,000 per year of reactor operation.* **]** [7]

To provide adequate protection of the public health and safety, current NRC regulations require conservatism in design, construction, testing, operation and maintenance of nuclear power plants. A defense-in-depth approach has been mandated in order to prevent accidents from happening and to mitigate their consequences. Siting in less populated areas is emphasized. Furthermore, emergency response capabilities are mandated to provide additional defense-in-depth protection to the surrounding population. **Risk insights can make the elements of defense-in-depth more clear by quantifying them to the extent practicable. Although the uncertainties associated with the importance of some elements of defense may be substantial, the fact that these elements and uncertainties have been quantified can aid in determining how much defense makes regulatory sense. Decisions on the adequacy of or the necessity for elements of defense should reflect risk insights gained through identification of the individual performance of each defense system in relation to overall performance.** [8]

Application of the safety goals requires an integrated approach to regulation. In addition to consideration of the qualitative and quantitative goals, all safety impacts must be considered as part of the overall risk management approach to maintaining or reducing risk. Supporting analyses should be based on the as-built and as-operated and -maintained plant, and they should reflect operating experience and be subjected to quality controls. Uncertainties must be considered explicitly in both the supporting analyses and in the interpretation of the results. Defense in depth is mandated, as stated above, and safety margins must be sufficient to account for parameter, modeling, and completeness uncertainties. Data, methods, and assessment criteria used to support regulatory decision-making must be well documented and available for public review. If safety goal considerations are used to develop regulatory changes that could lead to an increase in core damage or large early release frequencies, such increases should be small. Such a limitation would avoid the potential for approving regulatory changes that, upon implementation, could be rescinded by the NRC on the basis that rescinding the change would constitute a "substantial increase" under the Backfit Rule. [9]

These safety goals and these implementation guidelines are not meant as a substitute for NRC's regulations and do not relieve nuclear power plant permittees and licensees from complying with regulations. Nor are the safety goals and these implementation guidelines in and of themselves meant to serve as a sole basis for licensing decisions. However, if pursuant to these guidelines, information is developed that is applicable to a particular licensing decision, it may be considered as one factor in the licensing decision.

Dated at Washington, DC, this ___ **of** _____**, 2001.**
For the Nuclear Regulatory Commission.

Richard A. Meserve, Chairman.

1. Incorporates Commission guidance from June 15, 1990, SRM, item 6, p. 4.

2. June 15, 1990, SRM, item 11.

3. Statement on minimizing environmental impact taken from SRM dated June 27, 2000.

4. Material excerpted from SRM dated June 15, 1990, p. 3, and SECY-00-0077.

5. Discussion drawn from Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis".

6. Discussion excerpted from Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis".

7. Deletion consistent with SECY-00-0077 and accompanying SRM.

8. Discussion taken from Commission's White Paper on Risk-Informed and Performance-Based Regulation, March 1999.

9. Material developed from the five principles of risk-informed regulatory decision-making in Regulatory Guide 1.174.