June 27, 2000

COMMISSION VOTING RECORD

DECISION ITEM: SECY-00-0077
TITLE: MODIFICATIONS TO THE REACTOR SAFETY GOAL POLICY STATEMENT

The Commission (with all Commissioners agreeing in part and disagreeing in part) approved in part the subject paper as recorded in the Staff Requirements Memorandum (SRM) of June 27, 2000.

This Record contains a summary of voting on this matter together with the individual vote sheets, views and comments of the Commission.

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Annette Vietti-Cook
Secretary of the Commission

Attachments: 1. Voting Summary
2. Commissioner Vote Sheets

cc: Chairman Meserve
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield
OGC
EDO
PDR

VOTING SUMMARY - SECY-00-0077

RECORDED VOTES

	APRVD	DISAPRVD	ABSTAIN	NOT PARTICIP	COMMENTS	DATE
CHRM. MESERVE	X	X			X	6/9/00
COMR. DICUS	X	X			X	6/7/00
COMR. DIAZ	X	X			X	6/1/00
COMR. McGAFFIGAN	X	X			X	6/8/00
COMR. MERRIFIELD	X	X			X	5/25/00

COMMENT RESOLUTION

In their vote sheets, all Commissioners approved in part and disapproved in part the staff's recommendation and provided some additional comments. The Commission, with Commissioners Diaz, McGaffigan, and Merrifield agreeing, disapproved the proposed change to elevate the qualitative statement of prevention of severe core damage accidents to a qualitative safety goal. The Chairman and Commissioner Dicus agreed with the staff's recommendation to elevate the qualitative statement of prevention of severe core damage accidents to a qualitative safety goal to clearly indicate the Commission's policy regarding the prevention of core damage accidents and the need for a balance between prevention and mitigation. The Commission also disapproved the staff's recommendation to include the statement "there be no adverse impact on the environment" in this policy statement; however, the Commission supported a qualitative statement expressing its intent to protect the environment and would consider the need to minimize adverse environmental impacts in regulatory decision-making. Subsequently, the comments of the Commission were incorporated into the guidance to staff as reflected in the SRM issued on June 27, 2000.

Commissioner Comments on SECY-00-0077

Chairman Meserve

I approve in part and disapprove in part the staff's proposal to modify the Reactor Safety Goal Policy Statement (SGPS) as recommended in SECY-00-0077. The specific recommendations in Items 1 - 9 in "Discussion of Potential Changes Under Consideration" in the SECY are discussed below.

1. Changes to reflect current policy, including plant-specific usage of safety goals and definition of "how safe is safe enough."

The staff proposes incorporating the basic guidance from SRM/SECY-89-102 that the SGPS establishes a level of safety that is "safe enough." The staff further proposes incorporating the "aspirational" guidance from the same SRM that the staff should strive for a level of risk consistent with the safety goals when developing new regulations. *I approve the staff's recommendation*.

2. Subsidiary objectives, including elevation of core damage frequency as a fundamental goal.

The staff proposes elevating the qualitative "objective" in the SGPS, of "providing reasonable assurance...that a severe core damage accident will not occur at a U.S. nuclear power plant" to a qualitative "goal." At first examination, this change may appear to accomplish very little, since "goal" and "objective" are often considered to be synonymous. However, in the context of the SGPS, there is an implied hierarchy that imputes a higher status to a "goal" than to an "objective." The staff's rationale for the change is that the "safety goals" in the SGPS deal with life and health risks to individuals and society, but there is no "safety goal" that addresses the Commission's policy regarding the prevention of core damage accidents and the need for a balance between prevention and mitigation. Elevating this policy objective to a goal could also be seen as reinforcing the strategic plan performance measure of "zero reactor accidents." In a previous letter (May 1998), the ACRS had recommended elevation of core damage frequency as a fundamental goal, although that recommendation reflected use of the quantitative value of 1×10^{-4} as the goal.

The prevention of accidents is one of the NRC's "goals" as a practical matter; however, the NRC's mission and strategic goals address only protection of public health and safety and the environment, not reactor safety *per se*, which is seen as a licensee responsibility. Elevation of the "objective" to a "goal" could be inappropriately construed as shifting emphasis to the protection of property rather than public health. Nonetheless, if appropriately worded, I believe that the modified SGPS would be an appropriate reflection of the emphasis that the Commission places on accident prevention, as well as mitigation. *I therefore approve the staff's recommendation*.

The staff does not favor use of the quantitative core damage frequency as a "fundamental goal" as previously recommended by the ACRS, citing the possibility of establishing a more restrictive goal than the quantitative health objectives (QHOs). I agree with the staff's position on this issue, though for a different reason. Despite the advances in PRA methodology over the past several years, I am mindful of the uncertainties in the absolute values of core damage frequencies generated by PRAs, and I believe that such numbers can be manipulated by subtle changes in assumptions. There may be a temptation to treat such numerical values as limits, leading to efforts to "tweak" models to gain compliance. However, the staff does recommend maintaining the 10^{-4} value as a subsidiary quantitative objective, which is, as a practical matter, the way in which the value is currently used in risk-informed regulatory decision-making. Thus, *I approve the staff's recommendation*.

3. Treatment of uncertainty.

The original SGPS discusses uncertainties in qualitative terms. The staff recommends incorporating language consistent with Regulatory Guide 1.174 (An Approach for Using Probabilistic Risk Assessment in Risk-Informing Decisions on Plant-Specific Changes to the Licensing Basis) on the consideration of uncertainties, including parameter uncertainties, model uncertainties, and completeness uncertainties, representative of the state of the art. This does not change the scope or the intent of the SGPS, but does make it consistent with current regulatory guidance and practice. *I approve the staff's recommendation*.

4. Defense-in-depth.

Defense-in-depth has been, and continues to be, one of the fundamental principles embraced by the NRC in its consideration of plant safety. Although it is not a regulatory requirement, as such, the guiding principle is reflected in many of our regulations and associated guidance documents. There has been considerable discussion, particularly between the staff and the ACRS, about how to interpret defense-in-depth in a risk-informed regulatory environment. While there is a range of opinions on this issue, I believe there is general agreement that defense-in-depth is a valuable concept. The White Paper on Risk-Informed and Performance-Based Regulation ties defense-in-depth to the uncertainties in risk assessment. The staff recommends extracting the guidance in this regard from the White Paper and incorporating it into the modified SGPS. The staff's approach provides a direct, albeit qualitative, linkage between defense-in-depth and the process of risk-informed regulation. *I therefore approve the staff's recommendation*.

5. Safety goal structure and adequate protection considerations.

The definition of adequate protection has been an ongoing issue for many years. The Congress, the GAO, the CSIS, and the ACRS have, at one time or another, all indicated that a more precise definition of adequate protection would promote a more transparent, objective regulatory process. The ACRS has gone further in proposing a possible structure of such a definition, in terms of a "three region" approach, using quantitative values of a goal and an upper limit. Risks that exceed the upper limit would be subject to immediate corrective action; risk below the goal would require no action (or conversely, actions that would result in risks not exceeding the goal could be allowed to proceed); risks between the two numerical values would be subject to review, considering the costs and benefits of reducing the risk.

The Commission has been reluctant to develop a more specific definition of adequate protection (which would presumably have a quantitative basis), arguing that existing regulations (e.g., the Backfit Rule) and regulatory guidance provide a sufficient basis for making regulatory judgments regarding adequate protection. In its **SRM on SECY-99-191**, the Commission indicated that further definition of adequate protection should be undertaken only after experience had been gained with risk-informed regulation. Accordingly, the staff recommends no change to the SGPS in this area. *While I agree with the staff's discussion in SECY-00-0077, I believe that there would be value in modifying the SGPS to acknowledge explicitly that regulatory guidance on adequate protection is included in the NRC's regulations and supporting documentation. Thus, I disapprove the staff's recommendation. The staff should develop a statement to add to the modified SGPS to address this point*.

6. General performance guideline for frequency of a large release of radioactive material.

The original SGPS directed the staff to evaluate a guideline of 1×10^{-6} per reactor year for large release of radioactive material. After several years of work on this issue, the staff finally came to the conclusion that this frequency was likely more restrictive than the QHOs, and could not be technically justified. This effort was terminated, with Commission approval, in 1993. Work to define a "large release" was similarly terminated.

In the White Paper on Risk-Informed and Performance Based Regulation, the Commission defined "large early release frequency (LERF)" as "the frequency of those accidents leading to significant, unmitigated releases from containment in a time-frame prior to effective evacuation of the close-in population such that there is a potential for early health effects." The staff and the ACRS have also concluded that a value for LERF of 1×10^{-5} would be consistent with QHO for early fatalities; this is the value used in staff guidance documents. The staff therefore recommends modifying the SGPS to remove the performance guideline and to incorporate a subsidiary objective (similar to CDF) for LERF of 1×10^{-5}. The staff's reasons for the change are: (1) it would be consistent with current regulatory practice; and (2) it eliminates the need to look at Level 3 PRA (environment dispersal) calculations, which are inherently more uncertain than evaluating containment response. *I approve the staff's proposed changes. The modifications would provide a practical, risk-informed guideline on large early release, and would reflect current regulatory practice*.

7. Societal risk.

The original SGPS addresses societal risk through a QHO that the risk of cancer fatalities as a result of nuclear power plant operations to the population near a plant should not exceed 0.1 percent of the sum of cancer fatality risks from all other causes. "Near the plant" was defined as within 10 miles of the plant site. The staff points out that there is an apparent disparity between the 10-mile value and the value of 50 miles that is used when performing regulatory analyses under the Backfit Rule. The staff therefore addresses the question of whether these the SGPS and the Regulatory Analysis Guidelines should be consistent. The staff's recommendation is to continue the current practice of using 10 miles for the QHO and 50 miles for regulatory analyses. The staff's explanation is that these two issues are fundamentally different, and that the use of two different mileage values is not inconsistent, but reflective of the different objectives. In regulatory analyses, the objective is usually to evaluate person-rem averted by a regulatory change, while the QHO in the SGPS is based on the societal risks from accidents. Moreover, the current approach is more protective of the public than moving to a common value. *I approve the staff's recommendation to retain the 10-mile zone in the SGPS and the 50-mile zone for regulatory analyses*.

8. Land contamination and societal impact.

The current SGPS does not include a goal or objective relating to environment protection at the same level as the objectives for protecting public health. The staff considers in this paper whether such a goal should be added, and ultimately concludes that a specific high-level objective in this area is not warranted. The staff's primary argument is that current analytical tools for evaluating environmental effects (i.e., land contamination) have significant weaknesses that limit predictions of these impacts (and associated health effects). The staff recommends that a qualitative statement to the effect that there should be no adverse impact on the environment should be added, consistent with the NRC's strategic plan.

I agree that Level 3 PRA analyses have significant uncertainties associated with them. However, I believe that the staff's recommended change is flawed in two ways. First, protection of the environment is a fundamental part of the NRC's mission, not just part of the strategic plan. Second, a statement that there should be "no adverse environmental impact" is inconsistent with the concepts of risk and adequate protection, since adverse impacts cannot always be completely eliminated. *Thus, I disapprove the staff's recommendation*. The staff should develop different language for this item. It is not necessary that it be stated as a "safety goal" as such, but the language should reflect environmental protection as part of the NRC's mission statement, rather than the strategic plan, and indicate the NRC will consider the need to minimize adverse environmental impacts in its regulatory decision-making, consistent with its mission to provide reasonable assurance of adequate protection of the environment.

9. Temporary changes in risk.

The current SGPS does not address temporary changes in risk, as a result of maintenance, equipment failures, etc. The staff notes that this issue is primarily one of implementation, and does not really rise to the policy level, particularly since these risks are controlled by regulations (maintenance rule), license conditions (technical specifications), and so forth. The staff recommends no changes to the SGPS in this area. *I approve the staff's recommendation*.

ACRS Letter

The recent ACRS letter on this SECY paper recommends abandoning entirely the staff's recommended approach of modifying the SGPS, and instead issuing a new policy statement on risk-informed regulation. The letter goes on to recommend a number of new initiatives, most notably, explicitly defining adequate protection using a 3-region model based on risk, as noted above in the discussion of item #5 from the SECY paper. Three ACRS members dissented from the letter, and their comments were also included.

I have considered the ACRS's recommendations and conclude that while they have merit, the NRC does not, in my view, have sufficient experience with implementation of risk-informed regulation to formulate such a policy statement at this time. Thus, consistent with the Commission's position as discussed in the SRM on SECY-99-191, the ACRS's recommendations with regard to development of a policy statement on risk-informed regulation, quantitative definition of adequate protection, and related issues should be deferred until further experience is gained with the use of risk-informed regulation.

Commissioner Dicus

I approve the staff's recommendations to modify the Commission's Safety Goal Policy Statement with the exception of the staff's recommendation to add a qualitative statement that there be no adverse impact to the environment.

In disapproving this recommendation, I agree with the comments of both Commissioner Merrifield and Commissioner Diaz and support establishing a qualitative statement describing the Commission's mission to protect the environment.

Commissioner Diaz

Since the Reactor Safety Goal Policy Statement (RSGPS) was last published in 1986, there have been significant changes in the nuclear power industry, in NRC's regulatory framework, and in reactor risk assessment methods. Several earlier papers discussed the staff's recommendation for revising the RSGPS to bring it up-to-date and to incorporate current regulatory practices already approved by the Commission. I commend the staff for its effort in responding to the Commission's direction regarding revisions to the RSGPS. The revised RSGPS should not only be consistent with the Commission's Strategic Plan, the PRA Policy Statement, but also provide greater definition and clarity to how the Commission makes it determination of "reasonable assurance of adequate protection of the public health and safety." At the same time, the RSGPS should remain a high level document without being overly prescriptive, and yet applicable to state-of-the-art regulatory technology.

My specific comments follow:

1. Changes to reflect current policy, including plant-specific usage of safety goals and definition of "how safe is safe enough"

I approve the staff's recommendation to modify the RSGPS to clarify the Commission's intent and to reflect the current regulatory practice already approved by the Commission, specifically, to clarify Sections III.A and V of the existing policy statement. I also agree with the staff that the five principles of risk-informed integrated decisionmaking outlined in Regulatory Guide 1.174 should be broadened to be applicable to more than license amendment reviews. The staff should incorporate in the RSGPS the Commission policy that safety goals are "goals" and not limits.

2. Subsidiary objectives, including elevation of core damage frequency as a fundamental goal

I agree that we should maintain a core damage frequency (CDF) of 1.0E-4/RY as a subsidiary quantitative objective. The statement in the existing RSGPS expressing the Commission's intent to prevent a severe core damage accident is clear, is consistent with the current NRC's Strategic Plan, and applicable to a risk-informed regulatory framework. Regarding Option 1, I believe that the existing RSGPS qualitative safety goals and the quantitative health objective are structured in parallel such that they both address individual and societal risks. I do not believe that elevating the existing qualitative statement to a qualitative goal offers sufficient benefit presently in clarifying the Commission's intent and yet may add confusion to the format of the existing parallel between qualitative goals and quantitative objectives. Therefore, I disapprove Option 1 but approve Option 3.

3. Treatment of uncertainty

I approve the staff's recommendation to incorporate more general portions of Regulatory Guide 1.174, Section 2.2.5 in Section IV of the RSGPS. The intent is to bring the RSGPS up to date in the treatment of uncertainties. The additions and modifications should be at a high level and succinct.

4. Defense-in-depth

I approve the staff's recommendation to incorporate the paragraph dealing with defense-in-depth from the White Paper (SECY-98-144) into the RSGPS. This paragraph discusses a manner of risk partitioning that should be implemented gradually as we improve risk assessment methods and gain more experience in risk-informed regulation.

5. Safety goal structure and adequate protection considerations

I approve the staff's recommendation not to change the RSGPS. Although we should strive for greater clarity in defining "adequate protection" and "no undue risk", I believe this could only be realized after we have gained sufficient experience in risk-informed regulation and developed risk methodology that offers more accurate quantitative definitions.

6. General performance guideline for frequency of a large release of radioactive material

To be consistent with the current regulatory practice, I approve the staff's recommendation to delete reference to the general performance guideline and to incorporate a large early release frequency of 1.0E-5/RY as a subsidiary numerical objective.

7. Societal risk

I approve the staff's recommendation not to change the respective distances for defining population in the RSGPS and in the Regulatory Analysis Guidelines**.**

8. Land contamination and overall societal impact

I approve the staff's recommendation not to add a safety goal to address this area and to consider the development of improved regulatory tools in the Planning, Budgeting, and Performance Management process. I agree the RSGPS should acknowledge that NRC's strategic plan has as one of its goals to protect the environment. However, I disapprove the staff's recommendation to add the qualitative statement: "there be no adverse impact on the environment." Instead of establishing a potentially unbound "no adverse impact" guideline, the staff should incorporate a qualitative statement expressing the Commission's intent to protect the environment. This succinct statement on environmental protection should be consistent with the "adverse impact" defined in the footnote of the performance goal for protecting the environment in the NRC's strategic plan (Fiscal Year 1997-2002).

9. Temporary changes in risk

I approve the staff's recommendation not to revise the RSGPS with regard to temporary changes in risk.

Commissioner McGaffigan

I join with Commissioners Diaz and Merrifield in commending the staff on their efforts to initiate a modest update of the 1986 Safety Goal Policy Statement. As I wrote in my vote on SECY-99-191, I was originally concerned that the staff had in mind something far more ambitious, namely developing in the Policy Statement a clear, concise definition of adequate protection. I said then that I thought such an effort would prove controversial, resource-intensive and premature, and would divert agency and stakeholder resources from more important activities. If that was ever the staff's purpose, the staff has correctly decided now to expend modest resources to update the Policy Statement simply to make it consistent with current regulatory practices. As described in the paper, the November 8, 1999, public workshop produced little or no support from either the industry or the public for more fundamental changes(1).

A majority of the Advisory Committee on Reactor Safeguards (ACRS) in an April 17, 2000, letter have urged the Commission to reject the staff approach and to develop "an entirely new policy statement on risk-informed regulation," which, inter alia, would state quantitative risk limits in a three-region approach with the unacceptable region defined by values of "about" 10^{-3}/yr for core damage frequency and 10^{-4}/yr for large early release frequency. I obviously agree with the three ACRS members who filed minority views to the effect that such a risk-informed policy statement is premature and would divert significant staff and industry resources from areas where they could be more productively used, such an implementation of the revised reactor oversight process and the revised maintenance rule and the development of PRA standards. I commend Mr. Shack, Mr. Barton and Mr. Bonaca for providing their separate views to the Commission.

With regard to the details of the modest revision to the Safety Goal Policy Statement, I concur in the views of Commissioners Diaz and Merrifield, namely approval of the staff recommendations except those relating to elevation of severe core damage to a qualitative safety goal (Option 1 of issue 2) and the addition of a qualitative statement that there be "no adverse impact on the environment" (issue 8). As Commissioner Diaz points out, this latter qualitative statement is absolutist and potentially unbounded. At most there should be a simple cross-reference to the Commission's intent to protect the environment as expressed in the Strategic Plan.

Commissioner Merrifield

I commend the staff for their efforts associated with SECY-00-0077, and for developing preliminary proposals for updating the Reactor Safety Goal Policy Statement to make it consistent with current practice and policy guidance. The Safety Goal Policy Statement has served the Commission well by providing a foundation for risk-informed regulatory activities.

I **approve** the overall staff recommendation to proceed with modification of the Reactor Safety Goal Policy Statement and its intent to seek public comments. I also approve the staff's recommendations outlined throughout SECY-00-0077 with the following two exceptions:

> First, with regard to core damage frequency, I **approve** the staff's Option 3 to maintain a core damage frequency of 10^{-4} per reactor-year as a subsidiary quantitative objective. However, while I agree with the staff that it is important to emphasize a balance between prevention and mitigation, I **disapprove** the proposed change to elevate the qualitative statement regarding severe core damage accident to a qualitative safety goal. The existing qualitative safety goals and two quantitative objectives provide adequate foundation for maintaining subsidiary objectives for core damage frequency and for large early release frequency.

Second, I **approve** the staff's recommendation to not develop additional safety goals related to the societal risk and land contamination. However, I **disapprove** the staff's recommendation to include statements related to the environmental protection in this Policy Statement at this time. As the staff has noted, current calculational tools to perform Level 3 PRAs have significant weaknesses that limit the utility of predictions of land contamination and collective doses at significant distances from the plant. Therefore, the development of any safety goal or subsidiary objectives must await improvement in the state-of-the-art.

Finally, I fully concur with the staff that it only consider defining "reasonable assurance of adequate protection" quantitatively after experience is gained with the various risk-informed approaches now being implemented. In my vote on SECY-99-191, I agreed with Commissioner Diaz, and stated that developing a precise definition of adequate protection is beyond our present capabilities. Clearly, the situation has not changed much, as we are still in the initial phase of implementation of various risk-informed activities.

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1. I should note that I am somewhat perplexed by NEI's April 11, 2000 comments on NRC's Strategic Plan. Those comments, which are inconsistent with all other NEI comments on revisions of the Safety Goal Policy Statement, urge NRC to develop a clear, concise definition of adequate protection.