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

OFFICE OF THE
CHAIRMAN

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February 12, 1990

MEMORANDUM FOR: Kevin Connaughton
Charlie Ader
Gail Marcus
Jack Guttmann
Wayne Houston

FROM: Annette Vietti-Cook

SUBJECT: DRAFT AGENDA FOR SAFETY GOAL MEETING

Enclosed is a draft agenda for the Safety Goal Meeting to be held Thursday, February 15, 1990 at 1:00 p.m., in the 18th floor Executive Conference Room, OWFN. Please note the meeting is starting an hour earlier than was indicated in the memorandum from Andy Bates dated February 7, 1990.

The enclosed draft agenda is intended to facilitate our discussion. Please review the draft agenda and provide me any additional topics you wish to discuss prior to the meeting if possible.

cc: A. Bates, SECY
W. Parler, OGC
J. Blaha, EDO
M. Taylor, EDO
R. Fraley, ACRS
D. Houston, ACRS

DRAFT AGENDA FOR SAFETY GOAL MEETING THURSDAY, FEBRUARY 15, 1990

COMMISSION'S PURPOSE FOR SAFETY GOAL

A means to:

communicate with the public on how safe is safe enough.

assure our regulations are appropriate.

OVERVIEW OF GENERAL AREAS FOR AGREEMENT BETWEEN STAFF AND ACRS

The safety goal is a definition of how safe is safe enough, and should not be equated to adequate protection.

The safety goal should be applied to judging the adequacy of regulations and regulatory practices, and not to make specific decisions about individual plants.

A five level hierarchy to translate the policy objectives into more workable performance objectives.

The first two levels defined in the Commission's 1986 Safety Goal Policy Statement.

Level One - Qualitative Safety Goal
Level Two - Quantitative Health Objectives

DIFFERENCES BETWEEN STAFF AND ACRS ON REMAINING LEVELS

Level Three - Large Release Guideline (A General Plant Performance Objective)

ACRS and the staff agree that the probability of a large release of radioactive material to the environment from a reactor accident should be less than 1 in 1,000,000 per year of reactor operation. (This was also cited in the Commission's Safety Goal Policy Statement.) However, the ACRS and the staff differ on the definition of large release.

Staff definition of large release: a release that has a potential for causing an offsite early fatality.

ACRS believes the definition should be in terms of the release itself (e.g. curies, leak or release rate, or fraction of the core or containment inventory). ACRS believes it should be independent of the site characteristics and should provide some criteria against which the design or performance of containments can be tested. They urge the Commission to direct the staff to develop a definition that focuses on the mitigative function of containment design characteristics independent of site or population characteristics.

How is each definition different in terms of actual implementation?

Has staff considered and rejected the ACRS definition? If so, on what basis was it rejected?

What would be involved for staff to develop a definition as suggested by ACRS?

The proposed large release guideline is less stringent than what the regulations already require, if we continue to define the term "credible" as 10 -7 per reactor year, as previously used in adjudication. In order to resolve this, must the Commission adopt a more stringent safety goal, or change how 10 CFR 100.11 has been interpreted and applied, or amend 10 CFR 100.11. If so, does staff suggest we proceed by changing how 10 CFR 100.11 is interpreted and applied? Do we have to amend 10 CFR 100.11? If so, will staff proceed with these changes following Commission action on the Safety Goal implementation plan?

Level Four - Performance Objectives

ACRS and staff agree on defining core melt probability as 1 in 10,000 per year of reactor operation. However, the ACRS recommended this level also provide a definition of conditional probability of containment failure and an expression of how well the plant is operated. Staff believes there is no workable definition for the expression of how well a plant is operated (major uncertainty in PRA). Since this may not be possible, ACRS recommends a prominent caveat in the policy or implementation plan warning that PRA results do not tell the full story. Also, staff recommends defining core melt probability for advanced reactors as 1 in 100,000 per year of reactor operation. ACRS believes this is an arbitrary level of conservatism.

What containment design criteria does staff plan to use to evaluate the IPE backend analyses from operating plants to determine whether a plant has sufficient mitigation features?

What containment design criteria is staff using to determine whether containment improvements are needed in the Containment Improvement Program?

Will ACRS's effort result in a containment performance objective that can be applied in licensing advanced reactors, and incorporated into the Safety Goal Implementation Plan? (The schedule for completion of this effort is April 1990.)

Given staff is recommending a general goal of containment failure probability of less than 1 in 10 for the EPRI Advanced Light Water Requirements Document for evolutionary plant designs, should the Commission adopt this goal in the Safety Goal implementation plan for at least this class of designs?

Should "enhanced safety" over the current generation of reactors be our stated goal for advanced reactors, rather than a specific number, such as the core melt probability of 1 in 100,000 per year of reactor operation?

Level Five - Regulations a Regulatory Practices

Staff and ACRS believe the Safety Goals should define how safe is safe enough, and should not be equated to adequate protection. The principal points of difference are as follows:

Staff believes that Safety Goals should be used to judge new regulations, some regulations on the books would be judged in the context of looking at new regulations, and plants would be obliged to make improvements up to the safety goal if cost benefit arguments so dictated.

ACRS believes that Safety Goals should be used to judge the adequacy of all regulations from the standpoint of whether those regulations result in classes of plants which can be and are operated in such a way as to meet the safety goals and thus provide adequate protection. Where classes of plants on average do not meet the Safety Goals, they believe the regulations should be changed with out regard to cost benefit arguments?

Currently, we view the regulations as providing adequate protection and beyond adequate protection the backfit rule would apply in which cost benefit arguments are used. How does the backfit rule fit into the ACRS's scheme of applying the Safety Goals?

How could ACRS's suggestion be implemented - by reviewing all regulations, by reviewing IPE results (only go as far as core melt frequency)?

In ACRS's letter dated October 11, 1989, they suggest we undertake a systematic review of the whole body of regulations and regulatory practices to assess consistency with the safety goal; however, they state that they are not suggesting a massive, resource intensive effort. How could this be done without being a massive effort?

Hal Lewis recommended a review of the body of regulations against the safety goal be performed by an independent group.

STAFF'S SPECIFIC RECOMMENDATIONS IN SECY-89-102

In SECY-89-102, staff specifically requested the Commission to:

1) extend the Safety Goal Policy guidelines to the staff for regulatory implementation,

2) approve use of their proposed structure, definitions, and quantitative objectives for implementation of the Safety Goal Policy,

3) direct staff to prepare a conforming amendment to the Safety Goal Policy Statement to incorporate these additional guidelines,

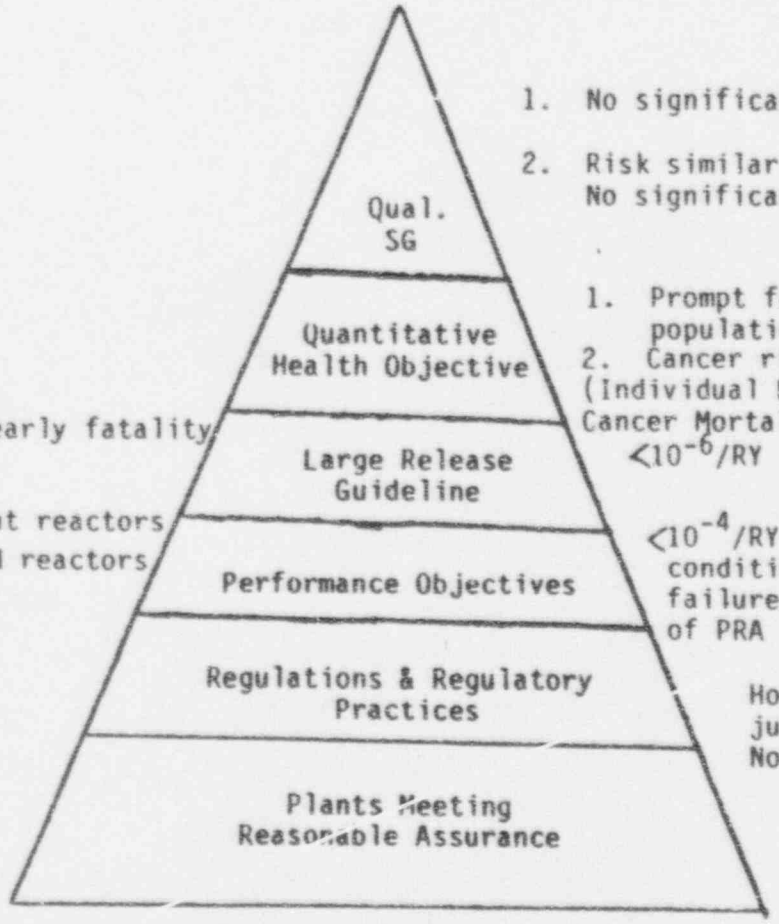
4) approve incorporation of averted onsite costs as an offset of other licensee costs in staff cost-benefit analyses, and

5) provide direction on whether to incorporate in an amended Safety Goal Policy Statement a clear relationship between the policy and the statutory standard of adequate protection.

The staff proposes that a cost/benefit analysis be done to determine what improvements should be made at a plant to meet the Safety Goals. In preparing the cost/benefit analysis, they propose that averted on site costs, that is the value of the licensees plant and equipment, be included as an offset against other licensee costs in order to calculate net cost. The Commission has consistently opposed inclusion of averted on site costs in cost/benefit analysis in the past. Recognizing the agency's responsibilities for protection of public health and safety, that is offsite persons and property, what is the staff's rationale for inclusion of averted on site cost as a benefit in staff cost-benefit analysis?

In terms of providing a clear relationship between the Safety Goal and the statutory standard of adequate protection, could we simply state that where we change regulations to raise the level of safety to meet the Safety Goal, using cost benefit, that we are enhancing the margin of safety, without changing the level of adequate protection?

Commission
Safety
Goal
Policy



1. No significant additional risk

2. Risk similar to other generating sources -
No significant additional risk

1. Prompt fatality risk $\leq$.1% of risk
population is generally exposed to
2. Cancer risk .1% of cancer risk in vicinity
(Individual Early Mortality Risk $\leq 5 \times 10^{-7}$/R-Y;
Cancer Mortality Risk $\leq 2 \times 10^{-6}$/R-Y)
$\leq 10^{-6}$/RY -- any major release unacceptable

$\leq 10^{-4}$/RY core melt prob. for all reactors +
conditional probability of containment
failure + how well operated or identify limits
of PRA

How safe is safe enough~~/adequate protection~~
judge regulations/classes of plants
No cost benefit

$\leq 10^{-6}$/RY + potential for offsite early fatality

$\leq 10^{-4}$/RY core damage prob. for current reactors
$\leq 10^{-5}$/RY core melt prob. for advanced reactors

How safe is safe enough + judge new
regulations

Use cost benefit

Staff

SAFETY GOAL IMPLEMENTATION POLICY
HIERARCHY

ACRS

Safety Goal
Bk 3 # 4313

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

NOV 16 1990

MEMORANDUM FOR: Carlyle Michelson, Chairman
Advisory Committee on Reactor Safeguards

FROM: James M. Taylor
Executive Director
for Operations

SUBJECT: UPDATE ON STAFF ACTIVITIES FOR SAFETY GOAL IMPLEMENTATION

Your September 11, 1990 letter to Chairman Carr on implementation of the Safety Goal Policy indicated that ACRS looked forward to future interactions as the policy implementation develops. The purpose of this memorandum is to update the Committee regarding ongoing staff efforts directed towards implementation of the Safety Goal Policy, specifically, the activities resulting from the Staff Requirements Memorandum (SRM) dated June 15, 1990. Also discussed are staff plans for interaction with the Committee on these implementation plans. The June 15, 1990 SRM contained four action items for the staff to address. These items and their current status are described below:

1. Large Release Definition (Wits 9000136)--The staff plans to propose, in a pending commission paper, a response to the Commission's request for a large release definition which focuses on accidental releases from the plant and eliminates site characteristics as suggested by ACRS. The guideline, as stated in the Safety Goal Policy, calls for the overall mean frequency of a large release of radioactive materials to the environment from a reactor accident to be less than 1 in 1,000,000 per year of reactor operation. The staff believes that the large release definition should have a close connection to a release that could result in one or more offsite early fatalities (i.e. first person at any point offsite so affected) so as to remain reasonably consistent with the 0.1% prompt fatality risk established in the Safety Goal Policy. The staff is exploring alternative definitions and approaches to that proposed in SECY-89-102 that will not require plant specific site characteristics or a Level III PRA to implement. The alternative large release definition is expected to take the form of release of curies or fraction of the core inventory to the environment based upon a generically defined site consistent with the staff's

proposal to decouple siting from plant design. When an approach to an alternate definition is approved by the Commission, the staff plans to interact with and solicit ACRS comment on the detailed plans and actions for its implementation.

2. Consideration of the safety goals in the regulations and in regulatory practices (Wits 9000137)--The staff is developing a set of formal procedural steps to facilitate documentation to ensure that future regulatory initiatives are evaluated for conformity with the safety goal (i.e. included in guidance documents for performing regulatory analyses). The staff plans to discuss this topic with the ACRS after further development. To this end, the CRGR (at my request), in reviewing proposed generic requirements, has begun to review whether or not the safety goals have been adequately considered by the staff. Enclosed (enclosure 1) is the recent direction from CRGR in this regard. In addition, it is planned that an update of the CRGR Charter will include this practice.

3. Plan for assessing the consistency of regulations with safety goals (Wits 9000138)--The staff currently has a program underway to assess a set of previously identified regulations to ascertain those of marginal safety significance for which a recommendation for elimination or change can be proposed. The staff, in carrying out this program, is planning to examine the potential for using this effort to also assess a means of measuring the regulations against the safety goal. If this assessment proves feasible, it will provide the basis for reviewing and identifying regulations which are either unnecessary or require strengthening. The ACRS will be updated as this work progresses.

4. Meaning of the term "credible" (Wits 9000139)--Part 100 site evaluations currently depend on dose consequences from postulated accidents. While TID-14844 is referenced in the regulation as "guidance" for the source term, the regulation does not specify the postulated accident. Rather, the accident specified is one whose consequences are not exceeded by any accident considered "credible." It was fairly common to have issues raised in licensing proceedings concerning whether particular sequences should be considered as "maximum credible accidents," especially with the advent of PRA. The staff plans to evaluate the use of the term "credible" and will address it more fully in the context of pursuing the decoupling of siting from design as discussed in SECY-90-341, dated October 4, 1990. Interaction with

ACRS is planned as part of our decoupling effort, as described in that document. In addition to this effort, the Commission has recently directed (enclosure 2) the staff to incorporate the necessary and appropriate NEPA review of potential severe accident mitigation design alternatives in the design certification review for future reactor designs. We see the safety goals as a useful point of reference for this effort.

James M. Taylor
Executive Director
for Operations

Enclosures:
1. September 6, 1990 memorandum from E. Jordan
2. October 29, 1990 memorandum from S. Chilk

cc. R. Fraley, ACRS
Chairman Carr
Commissioner Rogers
Commissioner Curtiss
Commissioner Remick
SECY

Enclosure 1

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

September 6, 1990

MEMORANDUM FOR: Thomas E. Murley, Director, NRR
Eric S. Beckjord, Director, RES
Robert M. Bernero, Director, NMSS

FROM: Edward L. Jordan, Chairman
Committee to Review Generic Requirements

SUBJECT: IMPLEMENTATION OF SAFETY GOALS

This is to inform you that, in future CRGR meetings, the CRGR will review whether or not the safety goals have been adequately considered by the staff. To assist in this review, you are requested to describe the staff's consideration of the safety goals in future CRGR review packages.

In 1986 the Commission published its safety goal policy statement (Attachment 1). On June 15, 1990, the Commission directed the staff to routinely consider the safety goals in reviewing regulations and regulatory practices and to establish a formal mechanism for ensuring that this is done (Attachment 2, Item 3). On July 10, 1990 the EDO directed that, although the lead for establishing the mechanisms has been assigned to RES with assistance from NRR, the CRGR should incorporate into its normal deliberations whether or not the safety goals have been adequately considered by the staff for those matters which come before the CRGR (Attachment 3). Accordingly, the CRGR plans to consider this question for all matters that come before the Committee and document its conclusions/recommendations in the minutes of future meetings. Offices are requested to describe the staff's consideration of the safety goals in future CRGR review packages.

The degree to which issues can be related to the safety goals will vary. As stated in Attachment 2 and Attachment 3, "Recognizing that the state of knowledge is such that the degree to which regulatory issues can be related to the safety goals will vary considerably, the staff's consideration of the safety goals could range anywhere from quantitative risk comparisons involving the safety goals themselves to a deterministic judgment that, in light of the safety goals and available knowledge (or lack thereof), a given issue does or does not warrant a change to the regulations or regulatory practices." For the present, Attachment 3 provides the best detailed guidance related to addressing the safety goals. As experience is gained in considering the safety goals and as the formal mechanisms are developed by RES and NRR and the other staff actions described in Enclosure 3 are completed, it is anticipated that more detailed guidance will become available.

The EDO also directed that, if the CRGR Charter needs to be revised to accomplish these reviews, the necessary actions should be taken. A Charter revision is not strictly necessary for the CRGR to begin considering the safety goals; however, the Charter is otherwise in need of revision for clarification, updating, and emphasizing the consideration of the cumulative impacts of proposed requirements. Accordingly, a CRGR Charter revision will be proposed in September 1990 and it will include consideration of the safety goals. It is anticipated that this initial Charter guidance on addressing

safety goals will be general in nature and thus, it will not require revision as experience is gained and as formal mechanisms are developed. In a similar manner, the initial Charter emphasis on consideration of cumulative impacts is expected to be general and should not require revision as the staff finalizes its response to concerns expressed in the regulatory impact survey and gains experience in emphasizing this issue.

Edward L. Jordan, Chairman
Committee to Review Generic
Requirements

Attachments:
As stated

cc: J. Taylor
M. Taylor

Enclosure 2

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

OFFICE OF THE
SECRETARY

October 29, 1990

MEMORANDUM FOR: James M. Taylor
Executive Director for Operations

William C. Parler
General Counsel

FROM: Samuel J. Chilk, Secretary

SUBJECT: COMKC-90-18 - NEPA REVIEWS FOR DESIGN CERTIFICATION

The Commission (with all Commissioners agreeing) has approved the Chairman's proposal to identify the appropriate scope of severe accident reviews for NEPA purposes for a design certification. The staff should assure that, as part of their ongoing efforts for design certification, they incorporate the necessary and appropriate NEPA review of potential severe accident mitigation design alternatives for the design to be certified. In this connection, staff should explore potential concepts for defining "remote and speculative."

~~(EDO)~~ - (NRR/RES) (SECY Suspense: 5/1/91) 9000227

In addition, the staff and OGC should define and propose resolutions of other potential issues affecting the certification process, such as what specific procedures will be employed in the certification rulemaking, and whether an FDA or a design certification can contain open confirmatory issues. Such issues should be considered and resolved as soon as possible, or at least on a schedule which will not unnecessarily delay the review and certification of standard designs.

~~(EDO/OGC)~~ (OGC/NRR/RES) (SECY Suspense: 5/1/91)

cc: Chairman Carr
Commissioner Rogers
Commissioner Curtiss
Commissioner Remick

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Safety Grad
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