UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

January 10, 1983

Honorable Nunzio J. Palladino
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Dr. Palladino:

SUBJECT: ACRS REPORT ON SECY-82-1B: PROPOSED COMMISSION POLICY STATEMENT ON SEVERE ACCIDENTS AND RELATED VIEWS ON NUCLEAR REACTOR REGULATION

During its 273rd ACRS meeting, January 6-8, 1983, the Advisory Committee on Reactor Safeguards discussed SECY-82-1B, "Proposed Commission Policy Statement on Severe Accidents and Related Views on Nuclear Reactor Regulation," dated November 24, 1982. We also considered the memorandum of October 25, 1982, Samuel J. Chilk, SECY, to William J. Dircks, EDO, "Staff Requirements - Discussion of Severe Accidents - Policy Statement and Research Plan...." In our review, we had the benefit of a Subcommittee meeting held on December 21, 1982. The Committee has commented on earlier drafts of this SECY paper in reports dated February 8, 1982 and September 14, 1982.

As a result of the October 25, 1982 memorandum, S. J. Chilk to W. J. Dircks, the ACRS arranged a series of three Subcommittee meetings to discuss the proposed NRC research program in support of a regulatory approach for dealing with severe accidents as described in "Nuclear Plant Severe Accident Research Plan," NUREG-0900. The first of these meetings was held on December 21, 1982. You may recall that in our report of August 18, 1982 on NUREG-0900 and in our report of September 14, 1982 on SECY-82-1A, "Proposed Commission Policy Statement on Severe Accidents and Related Views on Nuclear Reactor Regulation," dated July 16, 1982, we expressed a number of concerns about what we considered to be the lack of a coherent and workable approach to dealing with severe accidents in the licensing of new plants and in the regulation of existing plants. We concluded that we could not judge the appropriateness or the adequacy of the research program without having examined one or several feasible approaches to which a research program could be related.

With these comments in mind, we requested the NRC Staff to present, during the Subcommittee meeting of December 21, 1982, whatever additional information had been developed on approaches to deal with severe accidents. We were surprised when we were informed that SECY-82-1B was, in the Staff's view, what the Commission is likely to adopt as its policy. The substance of SECY-82-1B is, so far as we can see, little different from that of SECY-82-1A.

In its statement of purpose, the policy statement is said to have been "revised to reflect Commission and ACRS comments." In our opinion, the policy statement of SECY-82-1B does not reflect the comments we have made in previous reports to the Commission.

Our comments on the various drafts of SECY-82-1 are summarized below together with some further recommendations. Additional details can be found in the attached excerpts from several previous ACRS reports.

1. As we understand the proposed policy, judgment as to whether an applicant for a license has dealt appropriately with severe accidents will depend heavily on the results of probabilistic risk assessment (PRA). Decisions will involve comparison of the results of the PRA with the numerical guidelines suggested in Revision 1 of "Safety Goals for Nuclear Power Plants," NUREG-0880. There is general agreement that large uncertainties exist in our ability to predict both the probabilities and the consequences of severe accidents. Furthermore, there is no generally agreed upon method for comparing the results of a PRA with the guidelines given in NUREG-0880.

2. For existing plants, it appears that some as yet undefined set of plant specific and generic PRAs will be used to draw generic conclusions about groups of plants. An effort will then be made to draw conclusions about specific plants. The process to be used is not yet defined, nor is it clear what methods will be used to define it. Indeed, we observe that experience gained with PRAs suggests that it may be inappropriate to use generic results in the evaluation of individual plants.

3. No specific guidance is given as to an appropriate balance between prevention and mitigation of severe accidents. Except for some rather general comments about the need to explore the behavior of containment systems, and some equally general comments about filtered vented containment systems and core retention devices, mitigation is largely ignored. It appears that in principle, under the proposed policy, only an appeal to prudent engineering practice or the use of ALARA in risk reduction could be used to generate containment specifications, for example, and requirements for other mitigation systems important to public health and safety.

4. We have in several reports expressed reservations about a strong dependence on PRA alone in decisions dealing with severe accidents. We note, however, that the Commission policy as expressed in SECY-82-1B would use PRA as a principal criterion in detecting and correcting weaknesses in design. We recommend that before issuing a policy statement on severe accidents, the Commission give consideration to the possibility of including more specific directions for systems or approaches for dealing with severe accidents. As examples we suggest:

(a) A statement that effort will be made to specify the performance of containment systems including subsystems for heat removal. It may not be feasible to do this at present, but an effort to do so can guide research that may be needed to determine if it is possible.

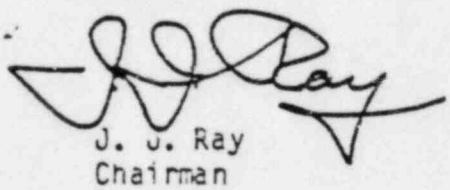
(b) Specifying improved performance for decay heat removal systems.

(c) Giving direction to a licensee that a plant design must include specific consideration of features to decrease the probability of damage from sabotage.

It appears to us that because of the close relationship that must exist among a safety goal, a policy on severe accidents, and a siting policy, a much more integrated approach is needed.

We recognize the considerable effort that has gone into the various drafts of SECY-82-1 and associated documents. We understand that the task is difficult. We nevertheless consider SECY-82-1B to be seriously flawed.

Sincerely,



J. J. Ray
Chairman

Attachment:
List of Relevant Comments from Previous ACRS Reports

References:

1. SECY-82-1B from W. J. Dircks, Executive Director for Operations, to NRC Commissioners, Subject: Proposed Commission Policy Statement on Severe Accidents and Related Views on Nuclear Reactor Regulation, dated November 24, 1982.
2. SECY-82-203A, from W. J. Dircks, Executive Director for Operations, to NRC Commissioners, Subject: Revisions to Nuclear Plant Severe Accident Research Plan, NUREG-0900 (Draft), dated August 30, 1982.

Attachment to January 10, 1983 ACRS Report on SECY-82-1B - List of Relevant Comments from Previous ACRS Reports

- "We believe that, before embarking on the course proposed for future CPs in SECY 82-1A, a concerted effort should be made by the NRC Staff and the ACRS to develop policy guidance on as many of the relevant safety issues as are tractable, and to propose an alternate approach to the Commission in which such policy guidance is provided to applicants for future standard plant designs." (Ref. 5, p. 2)

- "With regard to existing plants, we believe it would be productive for the NRC Staff to draft alternate positions on the most significant safety issues and to establish what would be needed in order to evaluate the alternatives." (Ref. 5, p. 3)

- "Neither the original nor the revised version of NUREG-0900 contains a delineation of an approach for dealing with severe accidents. This is needed to judge the appropriateness of the proposed research program. We continue to urge that the work necessary to provide one or more approaches be carried out. We look for requirements that might be placed on components or systems required to deal with severe accidents, description of what is now known about these, specifications of what, if any, information is required to describe system performance with the necessary accuracy, some indication of whether the information can be obtained from research in the time and with the resources available, and what research is planned to obtain the needed information." (Ref. 3, p. 1)

  "As an example, we note that, in the draft Implementation Plan for Safety Goals (July 16, 1982) provided to us, the NRC Staff concludes that it is not now feasible to specify the performance of containment systems. The NRC Staff further expressed an opinion that the information and approach needed for such a specification should be developed. We, therefore, looked at NUREG-0900 for a description of what new information is needed to specify performance of the various kinds of containments and containment systems now in use or proposed. Although there are elements of the program that could certainly contribute to more accurate specification of containment performance, we find no systematic descriptions of what information is needed or what part of the proposed program is designed to provide the information." (Ref. 3, p. 2)

- "We recommend that alternate containment performance criteria be developed and evaluated for existing nuclear power plants as part of the trial implementation program. A separate set of alternate trial containment performance criteria should be developed and evaluated during the trial period for plants yet to be designed." (Ref. 4, p. 2)

- "With regard to future plants, we believe that the NRC should examine and evaluate the safety-related changes now proposed or underway for LWRs in countries like France, the Federal Republic of Germany, Japan, Sweden, and the United Kingdom before arriving at its own judgment on what is appropriate for the U.S. For existing nuclear power plants, it is premature to assume that the available PRAs provide a generic basis for decision-making. On the contrary, despite their uncertainties the PRAs indicate the existence of important plant-specific differences which need to be factored into the formulation of policy. Again, the specific backfitting approaches currently underway or contemplated for LWRs in other countries should be examined and evaluated for their relevance to U.S. policy." (Ref. 5, p. 3)

- "In our recent reports specific attention was called to the need for organizing the research under this Decision Unit to answer questions likely to arise in connection with the Commission's stated intention to modify the licensing process to take specific account of accidents more serious than those generally identified as Design Basis Accidents." (Ref. 2, p. 9)

  "However, there is still a lack of definition of even one approach to deal with the severe accident issue. Considering the difficulty of the problem, effort should probably be made to define several alternatives." (Ref. 2, p. 9)

- "We find that the NRC program, as proposed, is not responsive to [previous] recommendations [that funding be reallocated to provide the information needed for the severe accident rulemaking]. The programs ... should be restructured so that the primary priority is to provide the information needed for decision-making concerning features to mitigate the consequences of accidents involving severe core damage or core melt, for reactors in operation and under construction and for reactors yet to be designed. This would allow the elimination of a substantial portion of the longer-term experimental and code development work." (Ref. 1, p. 9)

- "A focused priority effort is needed with respect to risk contributors such as seismic events, design errors, operator errors of commission, sabotage, and systems interactions to provide a methodology suitable for incorporation into PRAs on a trial basis or to identify and evaluate sources of uncertainty which make this impractical and to suggest regulatory approaches in light of these uncertainties." (Ref. 2, pp. 8-9)

- "Insofar as feasible, all accident initiators and risk contributors (other than sabotage) should be included in PRAs and in benefit/cost analysis. If the uncertainties are such as to make a meaningful

quantification for some initiator or contributor impossible, this should be documented in sufficient detail and an allocation of risk to this contributor justified." (Ref. 4, p. 3)

- "We believe that, in view of the continuing uncertainties to be expected in the art of PRA and a continuing inability to satisfactorily treat all initiators and other contributors to core melt frequency, and in view of the potentially very large differences in release magnitudes among different core melt accidents, containment performance design objectives are needed and should be developed expeditiously." (Ref. 6, p. 5)

Related ACRS Reports:

1. "Review and Evaluation of the Nuclear Regulatory Commisson, Safety Research Program for Fiscal Year 1983," NUREG-0864, dated February 1982
2. "Comments on the NRC Safety Research Program Budget for Fiscal Years 1984 and 1985," NUREG-0875, dated July 1982
3. "ACRS Comments on Nuclear Plant Severe Accident Research Plan," NUREG-0900 (Draft), dated August 18, 1982
4. "ACRS Report on the Draft Action Plan for Implementing the Commission's Proposed Safety Goals for Nuclear Power Plants," dated September 15, 1982
5. "ACRS Report on SECY 82-1A: Proposed Commission Policy Statement on Severe Accidents and Related Views on Nuclear Reactor Regulation," dated September 14, 1982
6. "ACRS Comments on the NRC Staff Questions to the Commission Concerning the Policy Statement on Safety Goals for Nuclear Power Plants," dated September 15, 1982

No. 83 1444 Logging Date 2/7/83

NRC SECRETARIAT

TO:
- ☐ Commissioner _____ Date _____
- ☒ Exec. Dir./Oper.
- ☐ Cong. Liaison
- ☐ Public Affairs
- ☐ _____
- ☐ Gen. Counsel
- ☐ Solicitor
- ☐ Secretary
- ☐ Inspector & Auditor
- ☐ Policy Evaluation

Incoming: Cordell Reed
From: Commonwealth Edison

To: Palladino Date 2/1/83
Subject: express support for and urge the Comm to adopt adopt the Policy Statement on Severe Accidents pro under SECY Memorandum 82-1B

☐ Prepare reply for signature of:
- ☐ Chairman
- ☐ Commissioner _____
- ☐ EDO, GC, CL, SOL, PA, SECY, IA, PE
- ☐ Signature block omitted
- ☐ _____
- ☐ Return original of incoming with response

☐ For direct reply*
☒ For appropriate action
☐ For information

Rec'd Off. EDO
Date 2/8/83
Time 8:00 AM

Xxxx Cpys to: SECY, RF

Remarks: _____

For the Commission: bac

*Send three (3) copies of reply to Secy Correspondence and Records Branch

NRC FORM 62A (3-82) ACTION SLIP

NRC FORM 232 (3-80)

EXECUTIVE DIRECTOR FOR OPERATIONS
PRINCIPAL CORRESPONDENCE CONTROL

FROM: Cordell Reed
Commonwealth Edison

TO: Chairman Palladino

DESCRIPTION: ☒ LETTER ☐ MEMO ☐ REPORT ☐ OTHER

On behalf of IDCOR Program expresses support for & urge Commission to adopt the Policy Statement on Severe Accidents proposed under SECY-82-1B

SPECIAL INSTRUCTIONS OR REMARKS

ASSIGNED TO	DATE	INFORMATION ROUTING
Denton, NRR for APPROP. ACTION	2/3/83	4. Vollmer
Hattson	2/8/83	5. Thompson
		Roe
		6. Grace
		Rehm
		Hinoque 7. Snyder
		Stello
		Cunningham
		Case/Denton
		1. PPAS
		2. Eisenhut
		3. Spits

SECY-83-1444

ACTION CONTROL
COMPL. DEADLINE 3/1/83
INTERIM REPLY
FINAL REPLY (5) 3/1/83
FILE LOCATION

DATES
DATE OF DOCUMENT 2/1/83
PREPARE FOR SIGNATURE OF:
☐ CHAIRMAN
☐ EXECUTIVE DIRECTOR
OTHER _____

CONTROL NO. 1274