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NOTE TO EDITORS:

The Nuclear Regulatory Commission has received three reports from its independent Advisory Committee on Reactor Safeguards. The attached reports sent to the NRC's Executive Director for Operations, in the form of letters, comment on:

- 1) Proposed revisions to NRC health effects valuation.
- 2) Resolution of generic safety issue 83, "Control Room Habitability."
- 3) Proposed priority rankings of generic issues.

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Attachments:
As stated

July 20, 1995

Mr. James M. Taylor
Executive Director for Operations
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Mr. Taylor:

SUBJECT: HEALTH EFFECTS VALUATION

During the 423rd meeting of the Advisory Committee on Reactor Safeguards, July 13-14, 1995, we discussed the recent staff reconsideration of the health effects valuation. During this meeting, we had the benefit of discussions with representatives of the staff. We also had the benefit of the document referenced but it differs in some details from the presentation.

In reviewing the health effects valuation, the staff recognized the recent risk coefficients issued by the International Commission on Radiological Protection and retained the linear dose hypothesis. These were used along with the Office of Management and Budget (OMB) recommended value for a "statistical life" to arrive at an indicated increase from the present \$1000/person-rem to \$2000/person-rem. We were told that such a change is unwarranted because of the order-of-magnitude uncertainty in the regulatory analysis. Consequently, the staff is not proposing to change the value and is considering the following four options for proceeding on this issue:

- Retain the \$1000/person-rem but require discounting.
- Retain the \$1000/person-rem but require separate quantification of offsite property effects.
- Retain the \$1000/person-rem but require both discounting and separate quantification of offsite property consequences.
- Retain status quo in the near term but allow use of the \$2000/person-rem subject to discounting and/or separate quantification of offsite property consequences as part of optional sensitivity studies.

We believe that the change in the value is warranted and do not support any of the four options. In the interest of technical correctness, consistency in use across Federal agencies, and regulatory coherence, we recommend use of the new value of \$2000/person-rem, as derived from the rounded-off product of the value of a "statistical life" (\$3M) and a risk coefficient for the stochastic health effects (7.3×10^{-4} fatalities/person-rem). This

value should be used as a dollar proxy for only the health effects associated with dose and should not be used (as in the past with the previous value) as a surrogate for other consequences such as prompt fatalities and land contamination. These other consequences should be evaluated separately as suggested in the draft Federal Register Notice. The MACCS code with an updated economic model would be an appropriate tool for such an evaluation. The new value should be expressed in terms of an identified year's dollars to allow users to make their own correction for inflation. Future effects should be discounted by present worth methods.

The selection of the value of a "statistical life" is the crucial determinant of the value of the health effects conversion factor. We believe that the present most appropriate means of establishing such a value is through the willingness-to-pay approach. This, however, can give a broad range of results that leads to a basic problem of defending the selection of any value from the range. The fact that a value is a median or a mean is not an appropriate defense for its selection in this case. In the absence of knowledge of any rationale underlying the existence of such a broad range, one has little recourse but to fall back on experience and judgment. In this spirit, we propose that there are basically two sound reasons for selecting the value of \$3M for a "statistical life".

1. It is specifically cited by the OMB. This is a strong step toward consistency in use across government agencies.
2. Judgment and experience show that it is an appropriate value.

In the past, the \$1000/person-rem has been used to represent both exposure and land contamination costs. We believe an exercise should be conducted to develop a sample estimate using the updated MACCS code for the relative magnitude of land contamination costs for severe accidents. Such a comparison would provide guidance on the need for a review of those previous decisions that may have involved predictions of considerable land contamination.

Sincerely,

/s/

T. S. Kress
Chairman

Reference:

Letter dated March 6, 1995, from Bill M. Morris, Director, Office of Nuclear Regulatory Research, to T. S. Kress, Chairman, ACRS. Transmitted draft Federal Register Notice on Proposed Revision to the Health Effects Valuation. (DRAFT PREDECISIONAL)

July 20, 1995

Mr. James M. Taylor
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Mr. Taylor:

SUBJECT: RESOLUTION OF GENERIC SAFETY ISSUE 83, "CONTROL ROOM
HABITABILITY"

During the 423rd meeting of the Advisory Committee on Reactor Safeguards, July 13-14, 1995, we heard presentations from the staff concerning resolution of the subject generic safety issue (GSI). We also had the benefit of the documents referenced.

We have had a long-standing interest in a variety of issues relating to control room habitability. The proposed resolution of this GSI deals with two of these issues, meteorological models and toxic chemicals.

The staff has developed meteorological models and computer software (HABIT) that will permit the staff and licensees to make more realistic estimates of radiological doses and toxic-gas exposures of control room personnel to determine compliance with General Design Criterion 19. The improved meteorological models in HABIT are based on reactor-model wind-tunnel tests and reactor-site tracer studies and will supplant the Murphy/Campe models referenced in Standard Review Plan Section 6.4. This extensive experimental program seems to be a promising basis for resolving meteorological concerns. The computer code, EXTRAN, that treats transport from the source to the control room air intake may not be adequate to deal with the wide variety of circumstances that arise. This is a complex arena for computation and any substantive comment by us would require more review of the meteorological models. We will only pursue this if control room habitability is determined by risk analyses to be an important safety issue.

The proposed resolution of GSI-83 is an example of the difficulty that arises in trying to apply design-basis concepts to resolve what is basically a risk issue. The staff appears to be refining the original "conservative" design-basis accident (DBA) approach by taking some of the conservatisms out of the calculational models. The intent of making these new calculations would be to obtain results that meet the DBA acceptance criteria. The problem with this approach is that the level of conservatism in the original DBA calculation has not been determined, nor has an acceptable level of conservatism been defined. We believe that the appropriate resolution of this GSI would be to determine the acceptable risk.

This requires a probabilistic treatment and quantified uncertainty using acceptable calculational tools.

The staff is also revising Regulatory Guide 1.78, "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release," to incorporate revised limits on toxic chemicals. We find the revised limits difficult to justify. The revisions have greatly increased limits found in Regulatory Guide 1.78. In most cases, the revised values are above the concentration limits considered "immediately dangerous to life and health." The limits have been chosen to assure that operators will have time to don breathing apparatus. Of more interest would be toxic chemical concentration limits that assure that any degradation of operator performance would not produce an unacceptable increase in risk. In evaluating degradation of operator performance, consideration should be given to the effects protective actions (wearing breathing apparatus, isolating the control room, etc.) will have on operator performance.

Finally, we discussed the 1988 survey of control room habitability systems at twelve nuclear power plants (NUREG/CR-4960). This program, which was initiated in response to concerns raised by the Committee, showed that there were many "compliance issues" with these systems. The staff told us that it had under consideration special plant inspections to deal with this situation. We wish to be kept informed of this activity.

Sincerely,

/s/

T. S. Kress
Chairman

References:

1. Memorandum dated June 6, 1995, from M. Wayne Hodges, Director, Division of Systems Technology, RES, to John T. Larkins, Executive Director, ACRS, Subject: Resolution of Generic Safety Issue 83, "Control Room Habitability"
2. NUREG/CR-6210 dated March 10, 1995, Computer Codes for Evaluation of Control Room Habitability (HABIT)
3. NUREG/CR-4960 dated October 1988, Control Room Habitability Survey of Licensed Commercial Nuclear Power Generating Stations
4. NUREG/CR-5669 dated July 1991, Evaluation of Exposure Limits to Toxic Gases for Nuclear Reactor Control Room Operators

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July 20, 1995

Mr. James M. Taylor
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Mr. Taylor:

SUBJECT: PROPOSED PRIORITY RANKINGS OF GENERIC ISSUES: NINTH GROUP

During the 422nd meeting of the Advisory Committee on Reactor Safeguards, June 8-10, 1995, we reviewed the priority rankings proposed by the NRC staff for the generic issues listed in the attached Table A. During this meeting, we had the benefit of discussions with representatives of the NRC staff. We also discussed this matter during our 423rd meeting on July 13-14, 1995.

Our comments on various generic issues considered during this meeting are contained in the following attachments:

Attachment 1 lists those generic issues for which we agree with the proposed priority rankings.

Attachment 2 identifies the issues for which we agree with the proposed priority rankings, but have comments.

Attachment 3 identifies the issue for which we disagree with the proposed priority ranking.

In addition to our comments on the priority rankings of those issues considered at this time, we are concerned that the prioritization process is not timely for some generic safety issues. Currently, three identified issues still await assignment of priority. One was first identified for prioritization in February 1991. However, we note that for the issues scheduled for resolution, the timeliness of resolution appears to be improving.

We note that often the title of a generic issue is much broader than the scope of the issue actually being addressed in the determination of priority. Examples are GSI-149, "Adequacy of Fire Barriers," and GSI-160, "Spurious Actuations of Instrumentation Upon Restoration of Power." Although we may agree with the priority assigned to the narrow issue defined by the scope, we do

James M. Taylor

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not wish to imply that we would agree that such a priority is necessarily appropriate for the larger issue denoted by the title.

Sincerely,

/s/

T. S. Kress
Chairman

Attachments:
As noted above

TABLE A

GENERIC ISSUES REVIEWED BY THE ACRS
DURING THE 422ND MEETING, JUNE 8-10, 1995

Generic Issue Number	Title	Priority Ranking Proposed by the NRC Staff	Reference Document
149	Adequacy of Fire Barriers	LOW	Memorandum from E. Beckjord to W. Minners, Oct 19, 1992
158	Performance of Safety-Related Power-Operated Valves Under Design-Basis Conditions	MEDIUM	Memorandum from E. Beckjord to J. Murphy, Jan 26, 1994
159	Qualification of Safety-Related Pumps While Running on Minimum Flow	DROP	Memorandum from E. Beckjord to W. Minners, Sep 22, 1993
160	Spurious Actuations of Instrumentation Upon Restoration of Power	DROP	Memorandum from E. Beckjord to W. Minners, Sep 30, 1993
161	Use of Non-Safety-Related Power Supplies in Safety-Related Circuits (previously called "Associated Circuits")	DROP	Memorandum from E. Beckjord to T. Murley, Mar 12, 1993
162	Inadequate Technical Specifications for Shared Systems at Multiplant Sites When One Unit is Shut Down	DROP	Memorandum from E. Beckjord to W. Minners, Jul 29, 1993
164	Neutron Fluence in Reactor Vessel	DROP (Ongoing RES efforts adequately address this issue.)	Memorandum from E. Beckjord to T. Murley, Nov 30, 1992
165	Spring-Actuated Safety and Relief Valve Reliability	HIGH	Memorandum from E. Beckjord to W. Minners, Nov 26, 1993

Generic Issue Number	Title	Priority Ranking Proposed by the NRC Staff	Reference Document
166	Adequacy of Fatigue Life of Metal Components	NEARLY RESOLVED	Memorandum from E. Beckjord and T. Murley to J. Sniezek, Apr 1, 1993
167	Hydrogen Storage Facility Separation	LOW	Memorandum from E. Beckjord to J. Murphy, Sep 29, 1994
168	Environmental Qualification of Electrical Equipment	NEARLY RESOLVED	Memorandum from E. Beckjord and T. Murley to J. Sniezek, Apr 1, 1993

ATTACHMENT 1

LIST OF GENERIC ISSUES FOR WHICH
THE ACRS AGREES WITH THE
PRIORITY RANKINGS PROPOSED BY THE NRC STAFF

<u>Generic Issue No.</u>	<u>Title</u>
158	Performance of Safety-Related Power-Operated Valves Under Design-Basis Conditions
159	Qualification of Safety-Related Pumps While Running on Minimum Flow
161	Use of Non-Safety-Related Power Supplies in Safety-Related Circuits
164	Neutron Fluence in Reactor Vessel
165	Spring-Actuated Safety and Relief Valve Reliability
166	Adequacy of Fatigue Life of Metal Components
167	Hydrogen Storage Facility Separation
168	Environmental Qualification of Electrical Equipment

ATTACHMENT 2

GENERIC ISSUES FOR WHICH THE ACRS AGREES WITH THE
PRIORITY RANKINGS PROPOSED BY THE NRC STAFF
BUT WITH COMMENTS

Generic
Issue No.:

160

Title:

Spurious Actuations of Instrumentation Upon Restoration
of Power

Proposed

Priority Ranking:

DROP

ACRS Comment:

The scope of the prioritization analysis appears limited to the risk associated with (1) inadvertent actuation of low-temperature overpressure-protection relief valve and (2) inter-system LOCA due to inadvertent opening of a low-pressure safety-injection (LPSI) discharge valve, combined with check valve failure, resulting in over-pressurization of the LPSI system from reactor coolant system pressure. This scope seems overly narrow, particularly in view of the continuing digitization of instrumentation and control (I&C) systems in operating nuclear power plants. The digitization of I&C systems warrants careful reconsideration of issues which originated with analog-based I&C systems, but which may become more risk significant due to the nature of digital technology. It may be appropriate to address this issue in the revision to the NRC Standard Review Plan.

Generic
Issue No.:

162

Title:

Inadequate Technical Specifications for Shared Systems
at Multiplant Sites When One Unit is Shut Down

Proposed

Priority Ranking:

DROP

ACRS Comment:

We note that the prioritization analysis did not encompass the Susquehanna spent fuel pool issue, which partly involved shared cooling systems at a multiplant site and upon which we commented in our letter of December 19, 1994. We believe that reconsideration of the scope of systems included in the prioritization analysis may be needed.

ATTACHMENT 3

GENERIC ISSUE FOR WHICH THE ACRS DISAGREES WITH THE
PRIORITY RANKING PROPOSED BY THE NRC STAFF

Generic
Issue No.:

149

Title:

Adequacy of Fire Barriers

Proposed

Priority Ranking:

LOW

ACRS

Recommendation:

MEDIUM

Basis:

The focus of this GSI is on overpressurization of fire barrier seals in room penetrations. Nuclear plant fire barrier qualification is usually based on meeting the ASTM-119 or NFPA-251/252 Standards. As noted in NUREG-0933, testing to these Standards does not always simulate realistic nuclear plant fire conditions. Accounting for the difference between these Standards and realistic conditions is a necessary first step to be taken before assessing the safety significance of specific issues such as this one. Accordingly, we believe that additional work needs to be done on this generic issue. Alternatively, such penetration seal issues as overpressurization could be included in the scope of NRR's current task action plan on fire protection requirements.