



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

June 23, 2009

SECRETARY

COMMISSION VOTING RECORD

DECISION ITEM: SECY-09-0051

TITLE: EVALUATION OF RADIOLOGICAL CONSEQUENCE  
MODELS AND CODES

The Commission (with Chairman Jaczko and Commissioner Klein approving in part and disapproving in part and Commissioners Lyons and Svinicki approving) acted on the subject paper as recorded in the Staff Requirements Memorandum (SRM) of June 23, 2009.

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

A handwritten signature in cursive script, reading "Andrew L. Bates".

Andrew L. Bates  
Acting Secretary of the Commission

Attachments:

1. Voting Summary
2. Commissioner Vote Sheets

cc: Chairman Jaczko  
Commissioner Lyons  
Commissioner Klein  
Commissioner Svinicki  
OGC  
EDO  
PDR

VOTING SUMMARY - SECY-09-0051

RECORDED VOTES

|                | APRVD | DISAPRVD | ABSTAIN | NOT<br>PARTICIP | COMMENTS | DATE    |
|----------------|-------|----------|---------|-----------------|----------|---------|
| CHRM. JACZKO   | X     | X        |         |                 | X        | 6/12/09 |
| COMR. LYONS    | X     |          |         |                 | X        | 4/17/09 |
| COMR. KLEIN    | X     | X        |         |                 | X        | 5/13/09 |
| COMR. SVINICKI | X     |          |         |                 | X        | 4/9/09  |

COMMENT RESOLUTION

In their vote sheets, Chairman Jaczko and Commissioner Klein approved in part and disapproved in part and Commissioners Lyons and Svinicki approved the staff's recommendation and provided some additional comments. Subsequently, the comments of the Commission were incorporated into the guidance to staff as reflected in the SRM issued on June 23, 2009.

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary  
FROM: CHAIRMAN JACZKO  
SUBJECT: SECY-09-0051 – EVALUATION OF RADIOLOGICAL  
CONSEQUENCE MODELS AND CODES

Approved X Disapproved X Abstain \_\_\_\_\_

Not Participating \_\_\_\_\_

COMMENTS: Below \_\_\_ Attached X None \_\_\_

  
\_\_\_\_\_  
SIGNATURE

06/12/2009  
\_\_\_\_\_  
DATE

Entered on "STARS" Yes X No \_\_\_\_\_

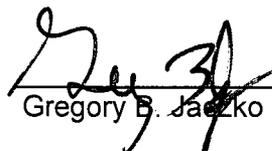
**Chairman Jaczko's Comments on SECY-09-0051  
Evaluation of Radiological Consequence Models and Codes**

I approve the staff's recommendation in SECY-09-0051 to use the radiological and economic consequence assessment model used by other Federal agencies for Radiological Dispersal Device (RDD) consequence modeling, but disapprove the staff's overall approach to the direction given to them in the September 10, 2008 Staff Requirements memo on "Economic Consequence Model."

As background, this direction to the staff followed the policy approved by the Commission from SECY-05-0233, "Plan for Developing State-of-the-Art Reactor Consequence Analyses." The Commission directed the staff to perform consequence analyses using state of the art modeling tools and to incorporate lessons learned about source term behavior, emergency preparedness, weather influence, and mitigation strategies in order to provide an update to the 1982 NUREG/CR-2239, "Technical Guidance for Siting Criteria Development." Subsequently, the Commission approved SECY-08-0029, "State-of-the Art Reactor Consequence Analysis – Reporting Offsite Health Consequences," and directed the staff, among other actions, to develop and deploy a common, accepted, well conceived methodology with respect to consequence modeling technology.

I believe that this SECY paper and recommendation should address the crucial issue of the clean-up standards that should be assumed for decontamination after explosion of an RDD. As Commission Lyons and I stated in August 2008 in COMPBL-08-002/COMGBJ-08-0003, the "staff should provide the Commission with policy papers, as necessary, on appropriate clean-up standards to use to determine economic consequences."

I agree with Commissioner Klein's comments in his vote on this SECY paper: the staff has not answered the question as to how guidance from the U.S. Environmental Protection Agency's Manual of Protection Action Guides (PAG) can be incorporated into an integrated evaluation and decision-making process. Clearly, the clean-up standard applied can greatly affect the economic consequences; for example, decontamination to a 100 mrem/yr standard would likely be less costly than decontamination to 25 mrem/yr standard. It may be perfectly appropriate to determine that a range of clean-up levels should be considered; however, SECY-09-0051 does not address this issue at all except by referring to the optimization approach used in the PAG and saying that optimization is "extremely difficult to incorporate into a computer code." Therefore, this SECY paper does not close out the tasking given to the staff regarding the policy issue of the use of clean-up standards in a consequence analysis. Staff should provide such a paper to the Commission within one year.

  
06/12/2009  
Gregory B. Jaczko

**NOTATION VOTE**

**RESPONSE SHEET**

TO: Annette Vietti-Cook, Secretary  
FROM: COMMISSIONER LYONS  
SUBJECT: SECY-09-0051 – EVALUATION OF RADIOLOGICAL  
CONSEQUENCE MODELS AND CODES

Approved  X  Disapproved   Abstain

Not Participating

COMMENTS: Below   Attached  X  None



Peter B. Lyons  
SIGNATURE

4/ 17 /09  
DATE

Entered on "STARS" Yes  X  No

**Commissioner Lyons' Comments on SECY-09-0051**

I approve the staff's recommended Option 1 to use the radiological assessment model developed by NNSA and supported by other Federal agencies for radiological dispersal device (RDD) consequence modeling. The staff has provided a strong rationale for their determination that an interagency model is preferable to MACCS2 for estimating the radiological consequences of RDDs while using upgrades to MACCS2 to better support its intended uses, i.e., to support offsite consequence estimates for Level 3 probabilistic risk assessments of severe accidents at light water reactors.

The NNSA report suggests that additional studies should be done to improve the accuracy of the methodology and the modeling. Staff should continue to engage the Federal agencies that have developed this methodology and modeling, and encourage these additional studies. Staff should also encourage broader acceptance of the methodology and modeling tools by other Federal and State agencies. Because States will play a major role in an RDD event, States' acceptance of the methodology and modeling tools is necessary, and staff should encourage engagement of States with the other Federal Agencies. Staff should use the methodology and modeling tools as part of a future RDD exercise to test its utility for decision making.

  
Peter B. Lyons      4/17/09  
Date

**NOTATION VOTE**

**RESPONSE SHEET**

**TO:** Annette Vietti-Cook, Secretary  
**FROM:** CHAIRMAN KLEIN  
**SUBJECT:** SECY-09-0051 – EVALUATION OF RADIOLOGICAL  
CONSEQUENCE MODELS AND CODES

Approved  X  Disapproved  X  Abstain

Not Participating

**COMMENTS:** Below   Attached  X  None

  
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5/13/09   
\_\_\_\_\_  
DATE

Entered on "STARS" Yes  No

## Chairman Klein's Comments on SECY-09-0051

One of the intended objectives of this paper was to enable the NRC to fully support a comprehensive, integrated, and consistent Federal response to a significant radiological event. While there are elements of this paper which are very insightful and which I support, one of the stated purposes of the paper, how the PAG Manual might be incorporated into an improved economic consequence model, remains unresolved.

SECY-09-0051 provides the results of staff's comparison of the MACCS2 computer code with other computer codes to determine the code that could best be employed by NRC to assess the radiological consequences of an RDD. The staff concluded that the MACCS2 code was inadequate for RDD consequence assessment and that upgrading the MACCS2 code for the purpose of RDD assessment is not a viable option. The staff recommends instead that NRC use a radiological and economic consequence assessment model already developed and supported by the Federal family for RDD consequence modeling. This model is referred to in SECY-09-0051 as the Department of Energy (DOE)/National Nuclear Security Administration (NNSA) consequence model, which combines the Explosive Release Atmospheric Dispersion model with the Automated Consequence Report for Insidious Dispersal model to calculate the radiological consequences of RDDs. I approve staff's recommendation.

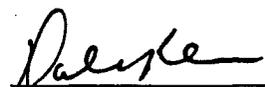
Nevertheless, the staff recommends that the MACCS2 code be enhanced, as appropriate, by incorporating insights that may be learned from the above referenced DOE/NNSA model. I approve the staff's recommendation with the understanding that the enhancements will target the intended uses of MACCS2.

It is critically important that the NRC be prepared to support an integrated Federal response to a radiological event, be it accidental or malicious. Employing common codes and models across the Federal family will help ensure a comprehensive and consistent response. This leads me to the other purpose of this paper; how the PAG Manual might be incorporated into an improved economic consequence model.

The staff points out that incorporating the relevant factors from the PAG Manual into a **computer code** (emphasis added) would be extremely difficult. This may be a case in which the phrases "consequence model" and "computer code" are being used synonymously. The Staff Requirements Memorandum of September 10, 2008, (SRM COMPBL-08-0002/COMGBJ-08-0003 – ECONOMIC CONSEQUENCE MODEL) directed staff to produce a policy paper discussing how guidance from the PAG Manual could be incorporated into an improved economic **consequence model** (emphasis added). The question that remains unanswered is how the guidance afforded by the PAG Manual might be incorporated into an integrated evaluation and decision making process that would enable the NRC to support a comprehensive, consistent Federal response to a radiological event. The staff should provide for Commission consideration a policy paper assessing the feasibility of this concept and, if the concept is viable, a description of proposed implementation.

In addition, I encourage the staff to continue participation in multi-agency organizations such as the Federal Radiological Preparedness Coordinating Committee and to continue

coordination with NRC's Federal partners, such as the Department of Homeland Security, the Environmental Protection Agency, and the Radiation Source Protection and Security Task Force. I am convinced that only through coordinated efforts such as these will the Federal government be able to achieve and maintain an integrated, comprehensive and consistent event response platform.

  
Dale Klein      05/13/09  
Date

**NOTATION VOTE**

**RESPONSE SHEET**

TO: Annette Vietti-Cook, Secretary  
FROM: COMMISSIONER SVINICKI  
SUBJECT: SECY-09-0051 – EVALUATION OF RADIOLOGICAL  
CONSEQUENCE MODELS AND CODES

Approved XX Disapproved \_\_\_\_\_ Abstain \_\_\_\_\_

Not Participating \_\_\_\_\_

COMMENTS: Below XX Attached \_\_\_ None \_\_\_

I approve staff's recommended Option 1, to use the radiological assessment model for RDD consequence modeling developed and supported by other Federal agencies.

  
SIGNATURE

04/9/09  
DATE

Entered on "STARS" Yes  No \_\_\_\_\_