



SECRETARY

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

February 7, 2012

COMMISSION VOTING RECORD

DECISION ITEM: SECY-11-0172

TITLE: RESPONSE TO STAFF REQUIREMENTS MEMORANDUM  
COMGEA-11-0001, "UTILIZATION OF EXPERT JUDGMENT  
IN REGULATORY DECISION MAKING"

The Commission acted on the subject paper as recorded in the Staff Requirements Memorandum (SRM) of February 7, 2012.

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 black ink, appearing to read "Annette Vietti-Cook", written over a horizontal line.

Annette L. Vietti-Cook  
Secretary of the Commission

Attachments:

1. Voting Summary
2. Commissioner Vote Sheets

cc: Chairman Jaczko  
Commissioner Svinicki  
Commissioner Apostolakis  
Commissioner Magwood  
Commissioner Ostendorff  
OGC  
EDO  
PDR

VOTING SUMMARY - SECY-11-0172

RECORDED VOTES

	APRVD	DISAPRVD	ABSTAIN	NOT PARTICIP	COMMENTS	DATE
CHRM. JACZKO	X	X			X	1/30/12
COMR. SVINICKI	X	X			X	1/23/12
COMR. APOSTOLAKIS	X	X			X	1/9/12
COMR. MAGWOOD	X	X			X	1/13/12
COMR. OSTENDORFF		X			X	1/13/12

**NOTATION VOTE**

**RESPONSE SHEET**

TO: Annette Vietti-Cook, Secretary  
FROM: Chairman Gregory B. Jaczko  
SUBJECT: SECY-11-0172 – RESPONSE TO STAFF  
REQUIREMENTS MEMORANDUM COMGEA-11-0001,  
“UTILIZATION OF EXPERT JUDGMENT IN  
REGULATORY DECISION MAKING”

Approved X (in part) Disapproved X (in part) Abstain \_\_\_\_\_  
Not Participating \_\_\_\_\_

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



\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

11/30/12

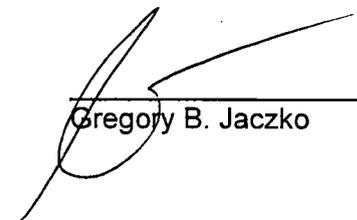
Entered on “STARS” Yes \_\_\_ No \_\_\_

**Chairman Jaczko's Comments on SECY-11-0172  
"Response to Staff Requirements Memorandum COMGEA-11-0001,  
Utilization of Expert Judgment in Regulatory Decision Making"**

I approve in part and disapprove in part the staff's recommendation to not develop any additional guidance for the formal use of expert judgment in regulatory decision making. I agree with my colleagues and the staff that improvements to the existing expert judgment approaches used by the NRC can be made, and that doing so is a worthwhile endeavor. Therefore, I join with my colleagues in supporting Commissioner Apostolakis' proposed scope for this work, as described in his vote.

I also find the concerns raised by the staff concerning skill set limitations of certain subject matter experts that will be needed to complete this work compelling. This is not the first time that the staff has expressed these concerns to the Commission. Last year, in the annual update of the risk-informed and performance-based plan (i.e., SECY-11-0151), the staff noted that the number of planned and ongoing risk-informed activities places a significant demand for risk analysts and other subject matter experts in engineering disciplines (e.g. fire, seismic) and has found it necessary to assess and adjust priorities in the budget execution process. Considering these known and communicated limitations on the availability of certain subject matter experts in the near-term, this work should be started at a more opportune time.

With that in mind, I support Commissioner Ostendorff's proposal to pursue this worthwhile work, and letting the staff decide the priority and resources for this work in accordance with the Planning, Budgeting, and Performance Management process. In doing so, the staff should ensure that this work once started will not displace or impede work of higher safety importance such as implementation of the Fukushima Dai-ichi lessons learned recommendations, completion of fire protection NFPA 805 licensing amendment reviews, or resolution of generic issues.

  
\_\_\_\_\_  
Gregory B. Jaczko

1/20/12  
\_\_\_\_\_  
Date

**NOTATION VOTE**

**RESPONSE SHEET**

**TO:** Annette Vietti-Cook, Secretary  
**FROM:** COMMISSIONER SVINICKI  
**SUBJECT:** SECY-11-0172 – RESPONSE TO STAFF  
REQUIREMENTS MEMORANDUM COMGEA-11-0001,  
“UTILIZATION OF EXPERT JUDGMENT IN  
REGULATORY DECISION MAKING”

Approved XX In Part Disapproved XX In Part Abstain \_\_\_\_\_  
Not Participating \_\_\_\_\_

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

I disapprove the staff's recommended Option 3, and join with my colleagues in approving a modified version of Option 2, in which Step 5 of Option 1 is included and is not changed in scope from Option 1. The staff's evaluation and discussion put forward in this paper was thoughtful, and was cognizant of the deliberate effort that will be necessary to undertake the development of unified guidance to promote the consistent use of expert judgment in regulatory decision making throughout the NRC. I agree with Commissioner Apostolakis, however, that the availability of guidance will ultimately save resources and has the potential to further enhance the transparency of our application of expert judgment, further enhancing the credibility of NRC's technical work.

  
\_\_\_\_\_  
SIGNATURE

01/23/12  
\_\_\_\_\_  
DATE

Entered on “STARS” Yes  No \_\_\_\_\_

**NOTATION VOTE**

**RESPONSE SHEET**

TO: Annette Vietti-Cook, Secretary  
FROM: George Apostolakis  
SUBJECT: SECY-11-0172 – RESPONSE TO STAFF  
REQUIREMENTS MEMORANDUM COMGEA-11-0001,  
“UTILIZATION OF EXPERT JUDGMENT IN  
REGULATORY DECISION MAKING”

Approved  Disapproved  Abstain

Not Participating

COMMENTS: Below  Attached  None



\_\_\_\_\_  
SIGNATURE

1/9/12  
\_\_\_\_\_  
DATE

Entered on “STARS” Yes  No

**Commissioner Apostolakis' Comments on SECY-11-0172,  
"RESPONSE TO STAFF REQUIREMENTS MEMORANDUM COMGEA-11-0001,  
'UTILIZATION OF EXPERT JUDGMENT IN REGULATORY DECISION MAKING'"**

I disapprove the staff recommended Option 3. I approve a modified version of Option 2 in which Step 5 of Option 1 is not changed in scope.

The modified Option 2 would develop guidance for the formal use of expert judgment to support regulatory decision making. This was the essential goal of the Commission's direction to the staff in the SRM on COMGEA-11-0001 dated March 15, 2011. Although a number of different approaches have been used in several NRC-sponsored studies, a structured, agency-wide process with corresponding implementation guidance is currently lacking. Its availability will formalize the utilization of expert judgment, incorporate lessons learned from past NRC studies and ensure that elicitation processes are applied consistently in regulatory decision making throughout the Agency.

Regulatory decisions are "integrated" (as Regulatory Guide 1.174 states explicitly), i.e., they are the result of the integration by decision makers of several inputs to the process. In cases of lack of experiential evidence, expert judgment methods are employed to produce information regarding the state of knowledge on particular issues. It is well known, however, that there is not one universally accepted way to elicit and process expert judgments. What the decision makers need to know is what methods have been used, what has not been done (thus imposing limitations on the results), and, as appropriate, the results of sensitivity studies using alternative methods.

Expert judgment was used recently to estimate loss-of-coolant-accident (LOCA) frequencies. These frequencies provided the basis for selecting the transition break size proposed in the risk-informed revision of the emergency core cooling system acceptance criteria (10 CFR 50.46a). The limitations of the elicitation process were listed explicitly in the published NUREG report. A unique feature of this project was that the expert judgments were "corrected" for potential biases, something that is not done routinely in such exercises. This project processed the expert judgments in a particular way (it developed the group results by taking the geometric average of the individual expert estimates). At the recommendation of the ACRS, group results were also produced using arithmetic averages of the individual estimates, as another NRC major study had suggested (the study by the Senior Seismic Hazard Analysis Committee). The two sets of results became, then, input to the integrated decision-making process.

With regard to the agency's prior uses of expert opinion solicitation, the staff asserts that "the use of alternate formal approaches likely would not have affected the outcomes of those decisions or the transparency of the method and how it was applied", and that "adequate guidance exists for implementing existing approaches." The experience with the LOCA frequencies indicates that these arguments are not valid.

The proposed Step 5 of Option 2 will provide an array of options for the user to choose from, but will not include specific guidance on implementation. The guidance will identify references that provide more detailed information to support implementation, but it will not include formal guidance to assist the user in selecting the best approach. Doing so would defeat the purpose of this study. The scope of Step 5 in Option 1 should be retained, i.e.,

The guidance will assist the user in selecting the best approach to be followed for the specific decision being supported (e.g., through the use of a decision tree or matrix), based in large part on the lessons learned from previous applications of expert

judgment. Illustrative examples will be used to demonstrate how the guidance should be implemented. Examples may be obtained from past NRC applications.

For instance, the staff should provide guidance on whether and under what circumstances future elicitation exercises should implement corrections to expert judgments, or, even better, whether results with both corrected and uncorrected judgments should be reported.

The staff also argues that, if Option 2 (or Option 1) is pursued, "activities related to human reliability analysis (HRA) and its support to larger probabilistic risk assessment (PRA) studies could be impacted". I find this argument puzzling. Both of these activities will require the extensive utilization of expert judgment. The availability of guidance will ultimately save resources and add to the credibility of these studies.



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George Apostolakis

1/9/12

**NOTATION VOTE**

**RESPONSE SHEET**

TO: Annette Vietti-Cook, Secretary  
FROM: COMMISSIONER MAGWOOD  
SUBJECT: SECY-11-0172 – RESPONSE TO STAFF  
REQUIREMENTS MEMORANDUM COMGEA-11-0001,  
“UTILIZATION OF EXPERT JUDGMENT IN  
REGULATORY DECISION MAKING”

Approved  X  Disapproved  X  Abstain

Not Participating

COMMENTS: Below   Attached  X  None

W. A. Vietti  
SIGNATURE

13 January 2012  
DATE

Entered on “STARS” Yes  X  No

**Commissioner Magwood's Comments on SECY-11-0172,  
"RESPONSE TO STAFF REQUIREMENTS MEMORANDUM COMGEA-11-0001,  
'UTILIZATION OF EXPERT JUDGMENT IN REGULATORY DECISION MAKING'"**

Expert elicitation is an important tool to help guide regulatory action in cases in which uncertainty exists due to insufficient data. Expert elicitation has been beneficial in areas such as modeling seismic hazard and damage and risk analysis associated with nuclear waste storage.

However, the success of expert elicitation hinges on the selection of the right subject matter experts using the right information. The essential objective of the SRM on COMGEA-11-0001 is to develop guidance to ensure that the utilization of expert judgment is applied consistently. This is an important and timely initiative. For that reason, I disapprove the staff recommended Option 3. Subject to the comments following, I approve instead a modified version of Option 2 as proposed by Commissioner Apostolakis.

However, I am concerned about the resource estimates presented in SECY-11-0172. Before proceeding with this entire work scope, I believe staff should provide to the Commission, within 6 months, a notation vote with a revised plan, schedule, and resource estimate informed and leveraged to the extent practicable by the existing library of accepted expert elicitation guidance and information. As the staff notes in SECY-11-0172, the agency has already generated many documents that have guided staff's application of expert elicitation. Examples include:

- NUREG/CR-5424, "Eliciting and Analyzing Expert Judgment: A Practical Guide"
- NUREG/CR-6372, "Recommendations for Probabilistic Seismic Hazard Analysis: Guidance on Uncertainty and Use of Experts"
- NUREG-1624, "Technical Basis and Implementation Guidelines for A Technique for Human Event Analysis"
- NUREG-1563, "Branch Technical Position on the Use of Expert Elicitation in the High-Level Radioactive Waste Program"
- NUREG-1829, "Estimating Loss-of-Coolant Accident (LOCA) Frequencies Through the Elicitation Process"
- NUREG/CR-2743, "Procedures for Using Expert Judgment to Estimate Human Error Probabilities in Nuclear Power Plant Operations"
- NUREG/CR-3688, "Generating Human Reliability Estimates Using Expert Judgment"
- NUREG/CR-2255, "Expert Estimation of Human Error Probabilities in Nuclear Power Plant Operations: A Review of Probability Assessment and Scaling"

Additionally, as staff develops its new paper, I suggest that it consult informally with organizations in the Federal family, national laboratory community, and FFRDCs to obtain a general understanding of the views of and practices in place within other organizations. One hopes that the staff would eventually be able to integrate the best approaches from these sources to develop a guidance document to help ensure consistent application of expert judgment at the NRC. Our objective should be to refine our approach and not to reinvent entirely new processes.



**William D. Magwood IV 1/13/2012**

**NOTATION VOTE**

**RESPONSE SHEET**

TO: Annette Vietti-Cook, Secretary  
FROM: COMMISSIONER OSTENDORFF  
SUBJECT: SECY-11-0172 – RESPONSE TO STAFF  
REQUIREMENTS MEMORANDUM COMGEA-11-0001,  
“UTILIZATION OF EXPERT JUDGMENT IN  
REGULATORY DECISION MAKING”

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

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

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

W. Ostendorff  
SIGNATURE

1/13/12  
DATE

Entered on “STARS” Yes  No \_\_\_

**Commissioner Ostendorff's Comments on SECY-11-0172,  
Response to SRM COMGEA-11-0001, "Utilization of Expert Judgment in Regulatory  
Decision Making"**

I disapprove Option 3. I support Commissioner Apostolakis's proposal (for approval of a modified version of Option 2 in which Step 5 of Option 1 is not changed in scope) as described in his vote comments on SECY-11-0172. I applaud Commissioner Apostolakis for taking this initiative. His approach will further advance our regulatory decision-making with improved guidance, and in a broader sense, advance nuclear safety.

A core mission of NRC research is to further the state-of-knowledge in nuclear safety and provide the best available regulatory guidance. Synthesizing diverse practices in the use of expert opinion facilitates knowledge management and is an essential building block to sustain further advancement in the discipline. To this end and with relatively minor resources, this project has the potential to achieve that core research mission. I recognize that the subject matter experts necessary to complete this work may be committed to other Commission directed projects. Therefore, the staff should prioritize and resource this work in accordance with the Planning, Budgeting, and Performance Management process as noted in SECY-11-0172.