February 5, 2001

MEMORANDUM TO: Chairman Meserve
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield

FROM: William D. Travers ***/RA by Patricia G. Norry Acting for/***
Executive Director for Operations

SUBJECT: THIRD STATUS REPORT ON RISK-INFORMING THE TECHNICAL REQUIREMENTS IN 10 CFR PART 50 (OPTION 3)

In SECY-99-264 (November 8, 1999), the staff provided the original plan and schedule for its work to risk-inform the technical requirements of 10 CFR Part 50 (Option 3). In SECY-00-0086 (April 12, 2000), the staff provided a status report on Option 3 activities, including an initial version of the "framework" document (a document the staff is using to guide Option 3 activities). In SECY-00-0198 (September 14, 2000), the staff provided a second status report focusing on the results of its feasibility study and recommendations to risk-inform 10 CFR 50.44, "Combustible Gas Control," an updated framework document, and a short status of other Option 3 work underway. The purpose of this memorandum is to provide the next status report on Option 3 activities.

Risk-Informing 10 CFR 50.46 (ECCS Requirements)

In SECY-00-0086, based on meetings with stakeholders and input from industry, 10 CFR 50.46 was listed as a high priority candidate regulation for evaluation under Option 3. In SECY-00-0198, the staff indicated that work had been initiated to develop risk-informed alternatives to the current 10 CFR 50.46. Making risk-informed changes to the technical requirements of 10 CFR 50.46 has the potential to affect other regulations, including the definition of the large break LOCA (LBLOCA), and thus, many aspects of plant design and operation. In addition, the development of the current 50.46 and LBLOCA has a lengthy history and was the focus of extensive hearings. Therefore, as the staff moves forward on this effort, in considering risk-informed alternatives, it is essential to proceed in a careful manner. Currently, the staff is evaluating two different approaches in establishing its plans for risk-informing 10 CFR 50.46. One approach is proposed by the staff and the second approach is proposed by the Westinghouse Owner's Group (WOG).

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Because of the extent of the potential impacts, the staff is considering a phased approach. Specifically, the staff approach under consideration consists of the following three phases:

- Phase 1: "Assessment of the LBLOCA with Respect to ECCS Requirements." This assessment would consider whether or not operating experience, fracture mechanics and thermal-hydraulic analysis and leak before break considerations warrant use of a different LOCA as a design basis accident, rather than the currently defined LBLOCA. It should be recognized, however, that any redefinition of the LBLOCA will involve the consideration of many factors and could ultimately not be judged feasible. In addition, the staff assessment would consider whether or not the current assumptions and practices for analysis of the LBLOCA are reasonable in view of risk information and current understanding in the areas of thermal-hydraulics and fuel behavior. However, the focus would be on ECCS requirements only (i.e., 10 CFR 50.46).

- Phase 2: "Assessment of the LBLOCA with Respect to Other Plant Design Requirements." This phase would address whether or not changes to other plant design requirements (other than the ECCS) dependent upon the LBLOCA assumptions are warranted based upon risk insights and Phase 1 results (e.g., 10 CFR 50.49, containment).

- Phase 3: "Assessment of the Current ECCS Acceptance Criteria." This phase would focus on assessing the 2200°F and 17% clad oxidation criteria, currently in 10 CFR 50.46. Current knowledge regarding cladding materials and burnup effects and risk insights will be used; however, if experimental work is needed this phase could result in an extended schedule.

To date, the staff has had several public meetings and a workshop on technical issues and options for risk-informing 10 CFR 50.46. The WOG has taken the lead (with support from the other owner's groups) for industry to work with the staff on 10 CFR 50.46. In our meetings, the industry proposed an approach that is rather different than the approach described above. The WOG approach would focus on redefining the LBLOCA design basis accident and apply the redefined LBLOCA to all current requirements dependent upon or which utilize the LBLOCA assumption. The WOG approach differs from the staff approach in two ways:

1. Instead of a phased approach, all regulations affected by a redefinition of the LBLOCA would be addressed at one time.

2. Only those technical requirements affected by a redefinition of the LBLOCA would be included. Reassessing analysis assumptions and acceptance criteria would then be of lower priority, if addressed at all.

The staff is currently assessing the industry proposal and the feasibility of redefining the LBLOCA. In addition, the advantages and disadvantages of the two approaches are being assessed. The results of these assessments are key to finalizing the schedule for completion of Option 3 work on 10 CFR 50.46. The staff will establish a detailed schedule for completion of the feasibility study on risk-informing 10 CFR 50.46 (including ACRS and stakeholder interaction) in the next few months. The next status report in June 2001 will provide the plan

and schedule for completion of the work on 10 CFR 50.46 to the Commission and will also provide preliminary recommendations on the feasibility of risk-informed changes to various elements of 10 CFR 50.46 and the feasibility of redefining the LBLOCA.

Special Treatment Requirements

The staff is continuing to assess the technical aspects of current special treatment requirements contained in 10 CFR Part 50. Under Option 2, the staff is addressing risk-informed changes to the regulatory scope for structures, systems and components in need of special treatment (e.g., quality assurance, environmental qualification). Option 2 does not address changing the technical content of the special treatment requirements, the design of the plant or the design-basis accidents. Under Option 3, the staff is assessing the risk-significance of technical requirements associated with the special treatment requirements in 10 CFR Part 50. This work is closely linked and integrated with the effort under Option 2. The Option 3 feasibility study is expected to be complete and recommendations provided to the Commission in the fall of 2001.

Study of Other Requirements

The staff is currently developing plans for work under Option 3 beyond that described above. Input received from stakeholders and work done to date on Option 3 by the staff are being considered in determining which regulation(s) from 10 CFR Part 50 are candidates to be risk-informed. The staff-identified candidates are identified in Table A-2 in Attachment 1 to SECY-00-0198 which, for convenience, is included as Attachment 1 to this paper. In addition, comments from stakeholders have been received identifying possible candidates. A January 19, 2000, letter from J. Colvin to Chairman Meserve is an example of such input and is included for information as Attachment 2.

As can be seen by Attachments 1 and 2, there are many potential candidates to assess. Given the staff's experience to date with assessing 10 CFR 50.44 and 50.46, the time and resources necessary to accomplish a feasibility review of all candidates could be large. Therefore, we are planning to solicit feedback on the priority of the candidates and recommend what additional work should be in the scope of Option 3, considering factors such as potential safety benefit and stakeholder interest, as well as the agency's four performance goals. We plan to report the results to the Commission in the June 2001 status report, including the basis for any changes to the scope of the work to be done as part of Option 3.

In parallel with Option 3, risk-informed changes to 10 CFR 50.61, "Fracture Toughness Requirements for Protection Against PTS Events," are also under evaluation. The status and schedule for this work have been previously reported in SECY-00-0140.

Stakeholder Input

In all of the Option 3 work we have allowed time for stakeholder interactions through workshops or meetings with interested parties (e.g., WOG) as well as interactions with ACRS. Also, if other information becomes available that would cause a change in the scope of Option 3, it will be addressed in the status reports.

Resources

Depending upon the above interactions and the reassessment of activities, there may be an impact on resources for both RES and NRR. Resources for the Option 3 RES activities and corresponding NRR rulemaking activities are included in the FY2001 budget and FY2002 budget request for each office. If additional resources are needed in FY2001 or FY2002, based upon the above work, they will be requested, either through reprogramming resources consistent with the PBPM process or through mid-year funding requests. We will ensure requests for FY2003 and beyond include sufficient resources for Option 3 and subsequent rulemaking activities.

Attachments: As stated

cc: SECY
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DOCUMENT NAME: g:\Tom's general\third status report on risk-informing 10CFR50

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DATE: 12/14/00

MEMORANDUM TO: The Commission

FROM: W. Travers

SUBJECT: THIRD STATUS REPORT ON RISK-INFORMING THE TECHNICAL REQUIREMENTS IN 10 CFR PART 50 (OPTION 3)

ORIGINATOR/SECRETARY: ROOM NO./BLDG: T10 C 24

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APPROVAL:	COMMENT:	SEE ME:
AS REQUESTED:	NOTE & RETURN:	PREPARE REPLY:
COORDINATION:	PER CONVERSATION:	

Table A-2 Part 50 Regulations potentially relevant to Risk-Informing

50.2	Definitions
50.12	Specific exemptions.
50.33	Contents of applications; general information.
50.34	Contents of applications; technical information
50.36	Technical specifications.
50.44	Standards for combustible gas control system in light-water-cooled power reactors.
50.46	Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors.
50.47	Emergency plans.*
50.48	Fire protection.*
50.49	Environmental qualification of electric equipment important to safety for nuclear power plants.
50.54	Conditions of licenses.
50.55a	Codes and standards.
50.59	Changes, tests and experiments.
50.60	Acceptance criteria for fracture prevention measures for lightwater nuclear power reactors for normal operation.
50.61	Fracture toughness requirements for protection against pressurized thermal shock events.*
50.62	Requirements for reduction of risk from anticipated transients without scram (ATWS) events for light-water-cooled nuclear power plants.
50.63	Loss of all alternating current power.
50.65	Requirements for monitoring the effectiveness of maintenance at nuclear power plants. (Eff. July 10, 1996)
50.66	Requirements for thermal annealing of the reactor pressure vessel.
50.68	Criticality accident requirements.
50.73	License event report system.
50.92	Issuance of amendment.

Appendix A:	General Design Criteria for Nuclear Power Plants
Appendix B:	Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants
Appendix E:	Emergency Planning and Preparedness for Production and Utilization Facilities (Partly relevant if EP for advanced reactors is different based on risk)
Appendix G:	Fracture Toughness Requirements (Maybe relevant)
Appendix J:	Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors
Appendix K:	ECCS Evaluation Models
Appendix Q:	Pre-application Early Review of Site Suitability Issues (Partly relevant)
Appendix R:	Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979
Appendix S:	Earthquake Engineering Criteria for Nuclear Power Plants (Partly relevant)

*50.47, 50.48 and 50.61 are not part of the scope of this effort; these regulations are being addressed under other programs.