



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

December 31, 1985

MEMORANDUM FOR: Robert B. Minogue, Director
Office of Nuclear Regulatory Research

FROM: Frank P. Gillespie, Director
Division of Risk Analysis and Operations
Office of Nuclear Regulatory Research

SUBJECT: STATUS OF RULEMAKING ACTIVITIES*

Below is an updated highlight report on the status of major rulemaking actions and related activities underway in the Office of Nuclear Regulatory Research as of December 31, 1985.

1. Decommissioning Criteria for Nuclear Facilities (Parts 30, 40, 50, 51, 70, 71)

As requested by the EDO, the staff is exploring the role of the Federal Energy Regulatory Commission (FERC) and Public Utility Commissions (PUCs) in dealing with the economic issues, in order to relieve NRC from dealing any more than possible in an area with which it is not familiar. A draft options paper was prepared and reviewed at DET level. A revised paper is now in preparation.

2. Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors (Part 50) (Appendix J)

Backfit rule requirements for the rulemaking are being clarified by ELD. Concurrence comments are being incorporated into the Commission package and being retyped by CRESS.

3. Licensing Requirements for the Storage of Spent Fuel and High-Level Radioactive Waste (Part 72)

EDO sent the rule package to the Commission on November 25, 1985. Staff is awaiting notification by the Secretary as to Commission action. On December 11, 1985, SP suggested to John Davis, NMSS, inclusion of a section on State and Tribal participation in the MRS licensing review. ELD has been asked to advise Mr. Davis as to the need for this addition to the rule.

*Items that were changed from the previous week have been flagged.

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4. Emergency Core Cooling Systems; Revisions to Acceptance Criteria (Part 50) (Appendix K)

A meeting was held between NRR and RES staff on November 8, 1985, to resolve technical differences concerning the rule and the associated regulatory guide. It was agreed that the 95 percent certainty limit would not be specifically mentioned in the rule. Rather, the rule would refer to "a high degree of certainty." The accompanying discussion would elaborate on this and mention the 95 percent certainty limit. The regulatory guide would then describe an acceptable method for achieving this degree of certainty. NRR would be provided with technical documents that describe in detail specific codes, models or methods referenced in the regulatory guide, so that they may perform an evaluation regarding acceptability. NRR formal comments have still not been received and there still appears to be difficulty within the NRR staff in reaching a consensus; different NRR divisions are making conflicting comments.

A revised Federal Register notice and Commission paper has been prepared considering the unofficial NRR comments and has been resubmitted to NRR and ELD for formal review and comment.

5. Modifications to GDC 4 Requirements for Protection Against Postulated Pipe Ruptures (Part 50)

The final limited scope rule is still under review by the EDO. The broad scope rule was revised to give greater detail on acceptance criteria to be used in implementing this rule.

6. Limiting the Use of Highly Enriched Uranium in Domestic Research and Test Reactors (Part 50)

Both OPE and OGC have been contacted regarding desired Commission changes to the HEU/LEU rule. RES staff will meet with these offices to coordinate changes. This meeting is tentatively scheduled for the week of December 30, 1985.

7. Emergency Preparedness for Fuel Cycle and Other Radioactive Materials Licensees (Parts 30, 40, 70)

CRGR considered the rule on November 27, 1985, and voted in favor of rulemaking by a vote of 4 to 3 (Ross, Mausshardt, Jordan, Bernero in favor; Stello, Scinto, Ippolito opposed). However, the minutes of the meeting are expected to indicate that everyone agreed that the rule is not justified technically (by a criterion such as \$1000/man-rem) but is favored because of policy issues.

8. Consideration of Earthquakes in the Context of Emergency Preparedness (Part 50)

The final rulemaking package was signed by the EDO on August 20, 1985. A Commission meeting was held on September 9, 1985. The Commission is expected to give the staff further instruction. An ACRS meeting was held on October 9, 1985. This meeting was held at the Commission's request in order to discuss SECY-85-283. ACRS input for this rulemaking was provided to the Commission on October 17, 1985. In accordance with Commissioner Asselstine's request, OGC has developed a position on reproposing the rule due to new arguments being presented in the current paper. This is being discussed between OGC and ELD to identify any differences with this position. On November 7, 1985, the ACRS discussed their comments on this issue with the Commission and fully supported the staff's proposed final rule outlined in SECY-85-283.

On December 4, 1985, the Chairman requested OPE to provide insight on the positions taken by the staff and the ACRS relative to SECY-85-283. The staff (RES and IE) are working with OPE to develop a position that does not focus on the frequency of the natural phenomena but on the codification of elements in an emergency plan that assures the necessary flexibility that can assist emergency planners in the event of any natural phenomena regardless of the specific phenomena and its probability.

9. Licenses and Radiation Safety Requirements for Well Logging Operations (Part 39)

The staff met on December 16, 1985, to discuss resolution of public comments. This was the eighth meeting and concluded these discussions. All issues seem to be generally resolved. A draft final rule is scheduled to be sent for division review on January 15, 1986.

10. Procedural Amendments Dealing with Site Characterization and the Participation of States and Indian Tribes in the Siting and Development of High Level Waste Geologic Repositories (Part 60)

Final amendments were transmitted to the Commission for affirmation in SECY-85-333, dated October 21, 1985.

11. Standards for Protection Against Radiation (Part 20)

The Federal Register notice of proposed rulemaking for 10 CFR Part 20 was published in the Federal Register on December 20, 1985, for a 120-day public comment period.

Other Related Issues12. Severe Accident Risk Assessment

Negotiations have been ongoing with NRR, DAE, and DET to develop a more fully integrated approach for establishing reasonable ranges and degrees of belief for the major risk uncertainties in the NUREG-1150 reference plant analyses. The outcome of these negotiations likely will be that NRR will pick up responsibility for three more of the issue papers (core-concrete, direct heating, and hydrogen production); and teams will be established for each issue consisting of representatives from RES, NRR, and contractors. A series of checks and balances will be established to assure that all available technical information will be reasonably displayed and that the views of all team members will be heard; and the mechanism for review and approval of the resulting position papers will include the cognizant RES and NRR branch chiefs and division directors, as well as the SARP Senior Review Group. This process not only should improve the quality of and the NRC consensus on these position papers, but it should also enhance consistency between NUREG-1150, the revised NUREG-0956, and the supplement to NUREG-0900.

13. Risk Effectiveness of LWR Regulatory Requirements

A meeting was held on December 17 and 18, 1985, at PNL in Richland, Washington, between the RES program manager and PNL staff to discuss the completion of FY 1985 tasks and the initiation of FY 1986 tasks. It was tentatively agreed that: (1) final reports for FY 1985 tasks will be submitted to NRC for review before the end of February 1986, and (2) PNL staff will complete detailed work plans for all regulatory areas selected for FY 1986 and will present these plans to NRC staff at Headquarters for comment during mid February 1986.

14. Shipping Cask Response to Severe Transportation Accidents--Modal Study

A meeting was held on December 18-19, 1985, at LLNL to discuss NRC comments on draft sections of the Engineering Report on the above subject. Recommended outlines for two sections were developed and given to LLNL for their consideration. Agreement was reached that a third section discussing potential radiological effects resulting from transportation accidents would be rewritten since the presentation was based on a misinterpretation of a referenced NRC document. Significant work still needs to be completed within the constraints of the remaining half of the allocated funding. The latest schedule indicates completion of the draft final report in mid-February--a 2-month slippage from the original schedule. A trip report on the meeting has been prepared.

15. Pressurized Thermal Shock

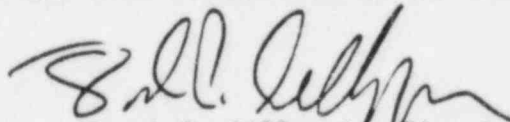
Brian Sheron has concurred for NRR on the PTS regulatory guide, and has returned the guide to RES to publish for public comment.

Ron Hernon, the NRR liaison with ACRS, and Paul Shewmon discussed NRR's proposed review of the guide. Dr. Shewmon has agreed to schedule the ACRS subcommittee meeting to review the guide during the public comment period.

16. Status of RES Independent Reviews

At this time, the Rulemaking Control Section estimates that the EDO will review RES independent recommendations for 64 rulemakings in FY 1986. As of December 31, 1985, the EDO has approved 8 rulemakings for continuation, 3 for termination, and has 3 rulemakings under review. In the period January 1986 through September 1986, the EDO will receive RES independent recommendations for 50 additional rulemakings.

RES has 13 rulemakings in hand for independent review, of which 5 are new proposed rulemakings for initiation, 2 are ongoing rulemakings for termination, 1 is an ongoing rulemaking for continuation, and 5 are ongoing rulemakings for annual review. In the period January 1986 through September 1986, RES will receive an additional 37 rulemakings for independent review. The status report of rulemakings reviewed by the RES independent review board and approved/disapproved by the EDO for FY 1986 is attached.



Frank P. Gillespie, Director
Division of Risk Analysis and Operations
Office of Nuclear Regulatory Research

Attachments:
As stated

RULEMAKINGS REVIEWED BY RES INDEPENDENT REVIEW BOARD AND
APPROVED/DISAPPROVED BY EDO FOR FY 1986

| # | Title of Rulemaking | Spon Ofc | Status of Review | Date FY86 Ind Review Completed | Date of FY86 EDO Approval |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------|--------------------------------------|---------------------------------|
| <u>Approved for Continuation by EDO</u> | | | | | |
| 80. | Licensing of Sources and Devices (Parts 30, 32, 40, 70) | NMSS | Initial review completed | 10/01/85 | 11/29/85 |
| 71. | Mandatory Property Insurance for Decontamination of Nuclear Facilities (Part 50) | SP | Annual review completed | 10/21/85 | 11/27/85 |
| 22. | General Design Criterion on Human Factors (Part 50) | NRR | Annual review completed | 06/04/85 | 10/21/85 |
| 77. | Personnel Access Authorization Program (Part of Insider Package) (Parts 50, 73) | NMSS | Annual review completed | 09/20/85 | 10/16/85 |
| 76. | Miscellaneous Amendments to 10 CFR Part 110 | IP | Annual review completed | 09/18/85 | 10/08/85 |
| 72. | Nondiscrimination on the Basis of Handicap in Nuclear Regulatory Commission Programs (Part 4) | SDBU | Annual review completed | 08/22/85 | 10/08/85 |
| 73. | Nondiscrimination on Basis of Age in Federally Assisted Commission Programs (Part 4) | SDBU | Annual review completed | 08/22/85 | 10/08/85 |
| 74. | Nondiscrimination on the Basis of Sex - Title IX of the Education Amendments of 1972, as Amended (Part 4) | SDBU | Annual review completed | 08/22/85 | 10/08/85 |
| <u>Under Review by EDO</u> | | | | | |
| 8. | Design and Other Changes in Nuclear Power Plant Facilities After Issuance of Construction Permit (Part 50) | IE | Memo RES to EDO dispatched December 19, 1985 | 12/19/85 | / / |
| 84. | Notification of NRC of Cases of Bankruptcy Filing (Parts 30, 40, 61, 70, 72) | RES | Memo RES to EDO dispatched November 26, 1985 | 11/26/85 | / / |

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| # | Title of Rulemaking | Spon Ofc | Status of Review | Date FY86 Ind Review Completed | Date of FY86 EDO Approval |
|-------------------------------------------|---------------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------|
| 53. | Safety Requirements for Industrial Radiographic Exposure Devices (Part 34) | RES | Memo RES to EDO dispatched November 12, 1985 | 11/12/85 | / / |
| <u>In Hand for RES Independent Review</u> | | | | | |
| 81. | Requirements for Possession of Industrial Gauges (Part 31) | NMSS | Memo RES to EDO being revised by staff | / / | / / |
| 82. | Residual Radioactive Contamination Limits for Decommissioning (Part 20) | RES | Revised memo RES to EDO submitted to RES for signature on December 17, 1985. RES is withdrawing this rule from the RA per memo Minogue to Dircks dated December 27, 1985 | / / | / / |
| 83. | Security Requirements for Category II Material at Fixed Sites (Part 73) | NMSS | HFSGB is conducting initial RES independent review | / / | / / |
| 54. | Protection of Contractor Employees (Part 50) | RES | Memo RES to EDO awaiting outcome of other actions. The staff is recommending that the Commission withdraw this proposed rule. Ref: memo Minogue to Dircks dated December 27, 1985 | / / | / / |
| 70. | Extension of Criminal Penalties (Part 50) | RES | Memo RES to EDO awaiting outcome of other actions. RES is withdrawing this rule from the RA per memo Minogue to Dircks dated December 27, 1985 | / / | / / |
| 68. | Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors (Part 50) | RES | Revised memo RES to EDO submitted to Chairman, RIRB, for concurrence on December 16, 1985 | / / | / / |

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| # | Title of Rulemaking | Spon Ofc | Status of Review | Date FY86 Ind Review Completed | Date of FY86 EDO Approval |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------|
| 1. | Physician's Use of Radioactive Drugs (Part 35) | NMSS | Annual RES independent review assigned to DRPES--will be conducted when NMSS circulates final rule for divison review | / / | / / |
| 35. | Seismic and Geologic Siting Criteria for Nuclear Power Plants (Part 100) | RES | RIRB package distributed December 9, 1985 for voting. RES is withdrawing this rule from the RA per memo Minogue to Dircks dated December 27, 1985 | / / | / / |
| 4. | Physical Protection Requirements for Independent Spent Fuel Storage Installations (ISFSIs) (Part 73) | NMSS | HFSB is conducting annual RES independent review | / / | / / |
| 86. | Export of Tritium (Part 110) | IP | Office review inadequate. Waiting for more information from IP. | / / | / / |
| 19. | Broad Scope Modification of General Design Criterion 4 Requirements for Protection Against Dynamic Effects of Postulated Pipe Rupture (Part 50) | RES | Annual RES review package to Chairman, RIRB, for concurrence on Decemeber 18, 1985 | / / | / / |
| 18. | Material Balance Reports (Parts 40, 70, 150) | NMSS | Annual RES independent review being conducted by HFSB | / / | / / |
| 10. | Financial Responsibility of Materials Licensees for Cleanup After Accidental and Unexpected Releases (Parts 30, 40, 61, 70, 72) | NMSS | Memo RES to EDO submitted to Chairman, RIRB, for concurrence on December 16, 1985 | / / | / / |

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| # | Title of Rulemaking | Spon Ofc | Status of Review | Date FY86 Ind Review Completed | Date of FY86 EDO Approval |
|-----------------------|-----------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------|
| <u>To Be Received</u> | | | | | |
| 7. | Communications Procedures Amendments (Part 50) | ADM | Annual review due 11/85. Memo sent to P. Norry, ADM, on October 25, 1985 requesting annual review package | / / | / / |
| 11. | Licenses and Radiation Safety Requirements for Well Logging Operations (Part 39) | RES | Annual review due 11/85. Reviewer informed. | / / | / / |
| 17. | Special Nuclear Material Physical Inventory Summary Reports (Parts 51, 70, 74) | RES | Annual review due 11/85. Reviewer informed. | / / | / / |
| 23. | Conforming Amendments to Prenotification, Quality Assurance, and Package Monitoring Requirements (Parts 20, 71) | RES | Annual review due 02/86. Note requesting annual review sent to reviewer on December 3, 1985. Rule is being withdrawn from the RA per memo Minogue to Dircks dated December 27, 1985 | / / | / / |
| 3. | Reporting Requirements for Safeguards Events (Parts 70, 72, 73, 74) | NMSS | Annual review due 02/86. Memo sent to J. Davis, NMSS, on December 11, 1985 requesting annual review package | / / | / / |
| 51. | Criteria for an Extraordinary Nuclear Occurrence (Part 140) | RES | Annual review due 03/86. Memo sent to K. Goller, RES, on December 11, 1985 requesting annual review package | / / | / / |

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| # | Title of Rulemaking | Spon Ofc | Status of Review | Date FY86 Ind Review Completed | Date of FY86 EDO Approval |
|-----|-------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------|
| 33. | Standards for Protection Against Radiation (Part 20) | RES | Annual review due 03/86. Memo sent to K. Goller, RES, on December 11, 1985 requesting annual review package | / / | / / |
| 25. | Proposed Revisions to the Criteria and Procedures for the Reporting of Defects and Noncompliance (Parts 21, 50) | IE | Annual review due 03/86. Memo sent to J. Taylor, IE, on December 11, 1985 requesting annual review package | / / | / / |
| 34. | Definition of High-Level Radioactive Waste (HLW) in 10 CFR Part 60 (Part 60) | RES | Annual review due 04/86 | / / | / / |
| 35. | Disposal of High-Level Radioactive Wastes in Geologic Repositories: Procedural Amendments (Part 60) | RES | Annual review due 04/86 | / / | / / |
| 64. | Modification of the Policy and Regulatory Practice Governing the Siting of Nuclear Power Reactors (Parts 50, 51, 100) | RES | Annual review due 04/86. RES is withdrawing this rule from the RA per memo Minogue to Dircks dated December 27, 1985 | / / | / / |
| 63. | Decommissioning Criteria for Nuclear Facilities (Parts 30, 40, 50, 51, 70, 71) | RES | Annual review due 04/86 | / / | / / |
| 65. | Licensing and Regulatory Policy and Procedures for Environmental Protection: Alternative Site Reviews (Parts 2, 50, 51) | RES | Annual review due 04/86. RES is withdrawing this rule from the RA per memo Minogue to Dircks dated December 27, 1985 | / / | / / |

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| # | Title of Rulemaking | Spon Ofc | Status of Review | Date FY86 Ind Review Completed | Date of FY86 ERO Approval |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------|
| 43. | Miscellaneous Amendments Concerning Physical Protection of Nuclear Power Plants (Part of Insider Rule Package) (Part 73) | NMSS | Annual review due 04/86 | / / | / / |
| 32. | Refinement of Emergency Planning Regulations (Part 50) | RES | Annual review due 04/86. RES is withdrawing this rule from the RA per memo Minogue to Dircks dated December 27, 1985 | / / | / / |
| 20. | Rule to Amend the Transportation Provisions Pertaining to the Shipment of Low Specific Activity (LSA) Material (Part 71) | RES | Annual review due 04/86 | / / | / / |
| 36. | Licensing Requirements for the Storage of Spent Fuel and High-Level Radioactive Waste (Parts 2, 19, 20, 21, 51, 70, 72, 73, 75, 150) | RES | Annual review due 04/86 | / / | / / |
| 37. | Part 51: Conforming Amendments (Parts 51, 60) | ELD | Annual review due 04/86 | / / | / / |
| 56. | Station Blackout (Part 50) | NRR | Annual review due 05/86 | / / | / / |
| 40. | Financial Responsibility Standards for Long Term Care for Low Level Waste Disposal Sites (Parts 30, 40, 61, 70, 72) | NMSS | Annual review due 05/86 | / / | / / |
| 61. | Access Authorization for Licensee Personnel: Implementation of Nat'l Security Decision Directive (NSDD) 84, "Safeguarding Nat'l Security Information" (Part 25) | ADM | Annual review due 05/86 | / / | / / |

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| # | Title of Rulemaking | Spon Ofc | Status of Review | Date FY86 Ind Review Completed | Date of FY86 EDO Approval |
|-----|------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------|--------------------------------------|---------------------------------|
| 46. | Modification of Protection Requirements for Spent Fuel Shipments (Part 73) | NMSS | Annual review due 05/86 | / / | / / |
| 42. | Uranium Mill Tailings Regulations: Ground Water Protection and Other Issues (Part 40) | NMSS | Annual review due 05/86 | / / | / / |
| 59. | Deletion of the Unusual Event Emergency Classification (Part 50) | RES | Annual review due 06/86 | / / | / / |
| 38. | Radiation Surveys and In-House Inspection Systems in Radiography (Part 34) | RES | Annual review due 06/86 | / / | / / |
| 67. | Emergency Core Cooling Systems: Revisions to Acceptance Criteria (Part 50) | RES | Annual review due 06/86 | / / | / / |
| 24. | Emergency Preparedness for Fuel Cycle and Other Radioactive Materials Licensees (Parts 30, 40, 70) | RES | Annual review due 06/86 | / / | / / |
| 62. | Nuclear Regulatory Commission Acquisition Regulations (48 CFR Part 20) | ADM | Annual review due 06/86 | / / | / / |
| 50. | Material Control and Accounting Requirements for Licensees Possessing Formula Quantities of Strategic Special Nuclear Material (Part 70) | NMSS | Annual review due 06/86 | / / | / / |
| 58. | Technical Specifications for Nuclear Power Reactors (Part 50) | NRR | Annual review due 06/86 | / / | / / |
| 41. | Searches of Individuals at Power Reactor Facilities (Part of Insider Package) (Part 73) | NMSS | Annual review due 06/86 | / / | / / |

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| # | Title of Rulemaking | Spon Ofc | Status of Review | Date FY86 Ind Review Completed | Date of FY86 EDO Approval |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------|--------------------------------------|---------------------------------|
| 49. | Safeguards Requirements for Nonpower Reactor Licensees Possessing Formula Quantities of Strategic Special Nuclear Material (Parts 50, 70, 73) | NMSS | Annual review due 07/86 | / / | / / |
| 55. | Improved Personnel Dosimeter Processing (Part 20) | RES | Annual review due 07/86 | / / | / / |
| 79. | Elimination of Inconsistencies between NRC Regulations and EPA Standards (Part 60) | RES | Annual review due 08/86 | / / | / / |
| 57. | Operator's Licenses (Parts 50, 55) | NRR | Annual review due 08/86 | / / | / / |
| 78. | Consideration of Earthquakes in the Context of Emergency Preparedness (Part 50) | RES | Annual review due 08/86 | / / | / / |
| 60. | Adjustment to Fee Schedule Publication (Part 25) | ADM | Annual review due 09/86 | / / | / / |

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1/9/86

NOTE FOR: R. Label
FROM: W. Lyon
SUBJECT: COMMENTS ON "PROPOSED REVISION TO THE ECCS RULE (10 CFR 50.46
APPENDIX K TO PART 50)," Memo from Speis to Directors, Dec. 12,
1985.

I have reviewed the subject memorandum and its contents. I find significant documentation to be missing and the review cannot be completed until the material is provided. The provided material is incomplete, does not present a balanced picture, and is not always correct. The actual Rule appears to be generally acceptable.

My approach is based on the perception that the Rule will influence a large number of licensing actions. Therefore, the NRR review, at a minimum, must be as good as the review we would provide for an applicant submittal. I have translated this into a critical appraisal. I have applied this philosophy to all of the backup material submitted with the Rule since, historically, such material is applied in later interpretation of the meanings of the Rule. This caused a problem in review at this time. Two significant and required documents are missing: the Regulatory Guide, which illustrates acceptable application of the Rule, and a technical backup document, which provides the technical foundation for the Rule. Therefore, I have not concentrated on review of the Rule in this appraisal, although a quick reading did not uncover problems. I have subjected the other submitted material to a critical review. If this material were contained in an applicant submittal, I would not find it acceptable in the present form.

The Enclosure contains my review comments. The initial section is an overview, and this is followed by comments pertinent to specific items in the documentation.



Warren C. Lyon

Enclosure: As stated

cc: C. Berlinger
M. Hodges
N. Lauben
E. Throm
C. Graves

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ENCLOSURE

COMMENTS ON "PROPOSED REVISION TO THE ECCS RULE (10 CFR 50.46 AND
APPENDIX K TO PART 50)," Memo from Speis to Directors, Dec. 12, 1985.

OVERVIEW

I offer the following observations:

1. I believe the approach should be balanced, and should address all aspects of the change. What we have is an argument for relaxation of unnecessarily restrictive on plants, with a weak picture that although the safety margin may be reduced, it isn't going to hurt the public. But there's much more to this rule change. Where is the objective look at the effect on public health and safety? Where are the improved public health and safety aspects of the change? Where are the impacts, both positive and negative, with respect to design of new plants? For instance:

- a. Best Estimate (BE) investigations tell how the plant will behave and one may plan accordingly. Evaluation Model (EM) based investigations, with the built-in conservatism, can be misleading. A good example of reaching an incorrect conclusion due to conservatism is the hydrogen bubble problem during the Three Mile Island (TMI) accident. The "conservative" approach provided substantiation for the belief there was a serious problem. A realistic BE approach probably would have shown there was no problem. I suspect consideration of uncertainty based on the BE would have similarly shown there to be no problem. The point is, we didn't do it, and we were misled.

We encounter this philosophy continually in plant design, plant operation, and evaluation of plant response to perturbations. A BE basis is important in keeping the plant as the correct focus.

- b. Plant designers may be misled due to EM licensing requirements. Should accumulators be designed for low pressure so that the rule requirement for throwing away water in the calculation is less restrictive? Or is it better to influence such decisions by an accurate understanding of how the plant behaves during an accident when the equipment is needed?
- c. Plant operation may be misled due to licensing requirements. Should one operate the plant to remain within the guidance of a highly conservative calculation of release during a steam generator tube rupture (SGTR) accident and risk sticking open a steam generator safety valve? Or is it better to use an accurate calculation of release, with suitable allowance for uncertainty, and minimize the probability of opening the safety?

The change in philosophy prompted by the new rule is of substantial benefit in changing the approach to accident understanding, and in this respect, will lead to better protection of the public health and safety. It tells you where you are, it doesn't mislead to incorrect conclusions, and can be used to evaluate the margin of safety. This will counter some of the reduction in margin that is identified in the documentation. How much? That would be difficult to establish in total, but selected individual examples could be easily quantified.

On the negative side, what about the tendency to use the rule to design? Will a vendor use the new rule to accomplish a significant reduction in safety injection pump size, for example, thereby removing a significant safety margin and accident mitigation flexibility? Where is this considered? The impact of the rule on new plants and their design is not addressed. This is an important area.

- 2. NRC previously identified failure to give credit to non-NRC research. Although the situation is improved, further effort is necessary. Examples? The Westinghouse operated experimental facilities referenced for PWR reflood work appear to be NRC facilities in the documentation. The General Electric operated BWR LOCA facilities similarly appear to be NRC facilities. Has EPRI done anything of significance? Obviously, the response is positive. Where is it recognized? The prejudice in favor of NRC funded work remains.

3. Conservatism is generally tested in terms of temperature, and comparisons are made on this basis. This is a significant comparative item only for large break LOCA. It is of secondary concern in the real world of small break LOCA, where a temperature rise is encountered only if the core is significantly uncovered, and the initial test of how far one is away from trouble is how much water covers the core and what is the trend in water level. Further, any one test, in and of itself, may be misleading. Several are necessary for a complete evaluation.
4. Conclusions are often drawn which appear to be generalities, which are incorrect, or which are stronger than warranted. Much of the time these are presented without backup. Other examples exist where the conclusion does not follow from the foundation material, or where the writer has been misled by a limited sampling. We must be assured adequate proof is available if we are to maintain credibility, and we must eliminate the fuzzy and incorrect conclusions. This is addressed in a number of places in my detail comments.
5. This documentation is unnecessarily wordy and difficult to read. Typical is usage of words such as "very" and "extremely", which do not strengthen the report. In this respect, I have made no attempt to edit the work, and many times comment only once on a problem which exists throughout the documentation.

The document that contains technical background and justification for many of the conclusions was not provided with the package. That document is a key item in this revision package, and many of my comments may be unnecessary when the technical document becomes available. Another key item, the Reg. Guide, is missing. This was part of the previous package, and was a significant problem area. The proposed revision package is not complete.

COMMENTS ON EACH DOCUMENT IN THE RULE PACKAGE

Stating the Commissioners Draft Memo

Page 2. Several conclusions provided. References are needed. We should be sure these conclusions are substantiated.

4. The temperature conclusions are true in general only for large break LOCA. Even small break LOCA's may not cause core uncover, and there will be little real difference between EM and BE where this is the case. Other small break LOCA's may not uncover in BE, but may encounter elevated temperatures in EM space. Since the phenomena may be different, it is a little wrong to state the conclusion is best shown via one LOFT test of large break behavior. I also wonder how much of the difference is due to LOFT specialities (such as the upper plenum dumping water) which is not applicable to the PWR's of interest here. Further, how does LOFT apply to BWR's?

The temperature example is also typical of many places where we have selected a parameter, and attempt to use it as "the" test of conservatism. What is really happening is we are in the vicinity of a "cliff" in behavior. Whether we are near the bottom or near the top may be of little importance if we've fallen over the edge. The real interest is how far we are from the edge so that we won't fall off in the first place. Under some conditions, temperature is a fair indicator of distance from the steep part of the cliff, although I prefer not to use it alone. Under other conditions, temperature will simply tell you that you're on the way to the bottom of the cliff. Whether you crash will depend upon other considerations.

6. A statement such as "These restrictions may be preventing optimal operation of some plants." really doesn't add anything. If we can't be more positive in a licensing justification, it doesn't belong in the first place.
7. References pertinent to the actions should be provided. This is a general comment applicable to a number of locations in the document.

8. "a. Some plants would continue to be unnecessarily restricted in operation by the current rule." Fact or postulate? Can we back this up?
- "c. Many licensees would continue to seek...." Do we know this? Can it be substantiated? Has it been happening?
9. In response to the hand written comment on including data in the rule, I do not believe this wise. We should attempt to write the rule in such a way as to not become obsolete. Including specific data could violate this. Including a requirement that the data be acceptable to the staff does not. Guidance or illustrations of acceptability belong in a Reg. Guide when we believe such guidance to be necessary. Similar comments apply to correlations or specific calculation techniques, such as computer codes.
11. As an example of my recommended approach philosophy, I suggest replacing "(1) A data base now exists that supports relaxation of the ECCS rule." with "(1) A data base now exists that supports modification of the ECCS rule." What I'm suggesting is an approach that emphasizes the protection of the health and safety of the public through better understanding and representation of plant behavior while simultaneously removing unnecessary restrictions. We have not addressed the first part of the suggested approach in what I have reviewed. Is there a reason for this which leads to rejection of a balanced approach?
14. See above comments in regard to incorrect restriction to large LOCA and lack of identification with enhancement of public health and safety.
- Note the words "... should ensure a negligible risk" This is weak with respect to justification for a rule change?
15. Good. We have an example of the new rule contributing to increased safety. There are many more. What I'm after is a balanced approach that provides both sides. What we have is emphasis on erosion of margin.
16. I do not believe the estimates on impact on staff resources. The real world will not be this kind.

Enclosure A. No comments.

Enclosure B.

- Prior comments on substantiation of conclusions, the slant of the approach, recognition of others, tests of conservatism, and applicability of the Rule to other than large LOCA apply.
- 7. What is " ... a very small number of applicable data ..."? Suggest rewording. Is "effect" the correct word. I think Webster would indicate "effect" is more appropriate.
- 8. A plot of film coefficient as a function of reflood rate, parametric in time, would be more effective in illustrating the point.
- 10. I agree with the note to rewrite the section.
- 11. An explanation of why footnote 2 is applicable to the 1979 standard would be helpful since the reference is dated in 1977.
- 12. The text and Appendix K reference the 1971 standard. How does the 1973 standard meet the requirements?
- 13. The discussion is repeditive.

Note the discussion of significant temperatures may be applicable only to large breaks, whereas the Rule addresses all breaks.

- 14. What is a 42% A experiment? What is G? What temperature difference? What is X? i.e., define the terms. Ditto other parts of the documentation.
- 21. "Another key finding of the LOFT program was that the actual nuclear fuel rods which were used in LOFT behave differently from the electrical heater rods used to simulate nuclear rods in other tests." Anyone with an ounce of sense in the heat transfer field knew this and was including the knowledge in analyses prior to the LOFT findings. I've never AIAA.

understood why this was treated as such a surprise, nor why so much documentation was prepared. I can make similar comments on the influence of fine on a fuel rod, although here the phenomena are difficult to compute, and investigations to obtain quantitative behavior are more valuable.

22. Note "phenomena" is singular.

Is substantiation available for "... cooling in an actual BWR is expected to be better than even that observed in small test facilities."?

23. "Heat transfer coefficients determined from large-break LOCA simulations with TLTAs are shown to be much larger than that specified in Appendix V." Please substantiate this conclusion for the first 20 seconds where the reverse is true. Please also explain how the test data compare for greater than 100 seconds.

25. I've gone through a number of figures without commenting on the lack of definitions. What is a WRAP? A WENT?

26. "The RELAP5⁽³¹⁾ computer code is a one-dimensional code which has gained popularity for use in evaluations of one-dimensional experiments and for other applications where multidimensional effects are not important." This is misleading. We've applied one dimensional codes for years to applications where multi-dimensionality is very important, and we've had considerable success. The key is whether the multi-dimensionality can be separated into one-dimensional paths or whether it can be suitably approximated at a small number of locations while using the one dimensional capability elsewhere.

28. I note the temperature comparison is good to within only a 100% error! This comparison doesn't come even close to showing that we understand what is going on.

I'll also note that I've always expected pressure comparisons to be good. Roughly, all you have to do is get the break flow right, and this can be accomplished by tuning past (or even the present) experiments. It's in the comparison of other parameters within the experiment, such as velocity, mass flow rate, density, and perhaps temperature, where the modeling inadequacies become apparent.

ENCLOSURE C.

1. Again, the prior comments on suitable evaluation parameters apply.
3. Do we know the reasons for the apparently significantly different conclusions between W, B&W, and CE plants? Are they well documented? Can they be defended? One implication of the statements is that there is more conservatism in W plants than in B&W and CE plants. Is this a correct conclusion? Are we prepared to make the statement?

"The rule change would not benefit BWR's beyond the benefit already available through use of SAFER." One of the arguments supporting the rule change was the benefit to the plants. I do not recall any exceptions for BWR's as a category.

"... but too little conservatism may remain for other plants. ... need to be supported by further analysis. ... it has therefore been recommended that such an analysis be part of any revised ECCS rule." I am not clear what all this means. And insofar as a recommendation is concerned, it is unacceptable. If there is a reasonable likelihood of insufficient conservatism to cover uncertainty, then an analysis is to be required, and means to obtain sufficient conservatism are also to be required.

4. The conservatism in 50.46 criteria is weak and should be significantly strengthened. Words such as "thought to be sufficient", "thought to be undesirable" and "would be expected" are too wishy-washy for providing proof. Citing test data from one test facility without establishing it to be an upper limit is not sufficient for treating the results as an upper limit. Could the effect have been seen at a lower temperature?
5. This is not a comparison of 2200°F as stated. Its a comparison of 1477°K to a coordinate of °C. Couldn't we at least use the same temperature units rather than three different ones on the same figure? More importantly, I don't know what to do with the four different lines which are placed in front of me without explanation.

6. Study results are referenced with the qualification "This revised Westinghouse EM is not the EM that Westinghouse would be expected to use under the ECCS rule currently being recommended." What does this mean? What does this mean with respect to applicability of the results to the conclusions?

"It is, therefore, expected that the revised ECCS rule would not result in increased powers sufficient to again hit the 2200°F limit. If Appendix K were revised, LOCA would no longer be limiting and other factors, such as DNB, would limit peak local power." What other perturbations could be made to relax the DNB restrictions and hence continue up in power? Can we expect Tech. Spec. change requests in other areas if the Rule is no longer restricting? What work has gone into examination of these and similar thoughts?

What are the implications of the rule change with respect to new plant designs? Can we expect to see significantly smaller safety injection pumps and/or accumulators in a new plant such as the advanced Westinghouse standard plant? If so, what are the implications with respect to such things as accident mitigation flexibility? Margin? Sabotage?

Enclosure D.

1. "The value of the proposed rule change may have some negative aspects since an increase in power of a plant may increase risk to the public. However, this negative value is believed to be very small and offset by other positive benefits to safety. While it is the intent of the proposed rule change to provide only positive impacts, there are also a number of pitfalls which must be avoided." What does this mean? Do you consider it consistent? What are these positive benefits to safety? I don't recall a discussion of these.
3. B&W and CE "... have informally indicated that they do not feel that the plants which they design are limited by LOCA, and therefore, B&W and CE plants would not benefit...." GE "... plants do tend to be limited in operation by LOCA restrictions and would greatly benefit...." These firm

conclusions do not follow from the wording which preceeds the conclusions. How is this consistent with CE actions to relax the Rule with respect to their plants? What about B&W?

"It can, therefore, be estimated that there are at least 30 nuclear plants on line that are limited by LOCA considerations either in total power and/or in flexibility of operation. Up to 20 additional plants may also eventually come on line which will be limited by LOCA considerations." I do not see that these conclusions have substantiation, nor do I see that the discussion that follows from the above is substantiated.

4. Under the "safety value" section, we're ruled out the fission product inventory as of significance with respect to power increase. There are many other items pertinent to "The value of the proposed rule change must also be evaluated in terms of the effect on safety." Where is the treatment of these.

What is a "service accident"?

5. Under potential pitfalls, another disruption is the use of the new Rule in unanticipated ways, plus the personnel tied up in handling of new analyses, review of unfamiliar territory, and the lack of a reference such as the Standard Review Plan. I have the impression that this two paragraph report section is an "add on" without substance.

Enclosure E.

- Few comments: Much of what I've said above is applicable.
7. "This method would remain acceptable because it is believed that Appendix K is conservative with respect to the realistic method proposed in the amended 50.46(a)(1)(i)." A belief is a poor reason in a Rule justification.

9. "The primary effect of the rule would be to allow an increase in the peak local power in the reactor. ... Changing the power shape without changing the total power would have a negligible effect on the environmental impact." This has not been established, and is an assumption. For example, have you investigated the influence of power shape changes on the likelihood of various accidents?

Enclosure E.

No additional comments.

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