ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

February 13, 1974

Honorable Dixy Lee Ray
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: STATUS OF GENERIC ITEMS RELATING TO LIGHT-WATER REACTORS

Dear Dr. Ray:

The Advisory Committee on Reactor Safeguards reported on the "Status of Generic Items Relating to Light-Water Reactors" in its letter of December 18, 1972. The Committee expected to report from time to time on the status of generic items. This is the second such report.

Group I of the attachment is a reiteration of the generic items considered resolved in the first report. Group IA includes those items resolved since that report, together with the specific action that resulted in the resolution. Group II includes those items included in the original report for which resolution on a generic basis is still pending. Group IIA includes generic items that were not included in the first report. The ACRS and the Regulatory Staff will continue to consider Group II and IIA items and their significance to safety on a case-by-case basis until generic resolution is reached. Formal actions such as issuance of Regulations or Regulatory Guides are anticipated for many of the Group II and IIA items.

The Committee reaffirms its position that "resolved" means that a specific conclusion or policy decision has been reached by the Directorate of Licensing and the ACRS. Resolution of an item indicates that the Committee is satisfied in a generic sense; however, this does not mean that improvements should not be investigated and, possibly, implemented; or that experience has been satisfactory. In fact, requirements may differ for specific plants because of such factors as site characteristics and

construction authorization dates, especially as they apply to backfit requirements.

The ACRS will continue to report from time to time on the status of generic items.

Sincerely yours,

W. R. Stratton

W. R. Stratton
Chairman

Attachments:
Generic Items
1) Group I
2) Group IA
3) Group II
4) Group IIA

GENERIC ITEMS

Group I - Resolved Generic Items

1. Net Positive Suction Head for ECCS Pumps:
   Covered by Regulatory Guide 1.1

2. Emergency Power:
   Covered by Regulatory Guides 1.6 and 1.9 and portions of IEEE-308 (1971)

3. Hydrogen Control After a Loss-of-Coolant Accident (LOCA):
   Covered by Regulatory Guide 1.7 and Supplement

4. Instrument Lines Penetrating Containment:
   Covered by Regulatory Guide 1.11 and Supplement

5. Strong Motion Seismic Instrumentation:
   Covered by Regulatory Guide 1.12

6. Fuel Storage Pool Design Bases:
   Covered by Regulatory Guide 1.13

7. Protection of Primary System and Engineered Safety Features Against Pump Flywheel Missiles:
   Covered by Regulatory Guide 1.14

8. Protection Against Industrial Sabotage:
   Covered by Regulatory Guide 1.17

9. Vibration Monitoring of Reactor Internals and Primary System:
   Covered by Regulatory Guide 1.20

10. Inservice Inspection of Reactor Coolant Pressure Boundary:
    Covered by ASME Boiler and Pressure Vessel (BPV) Code, Section XI

11. Quality Assurance During Design, Construction, and Operation:
    Covered by 10 CFR 50, Appendix B; ASME BPV Code, Section III; ANSI N-45.2-1971; Regulatory Guide 1.28, 1.33, 1.64; and Proposed Standard ANS-3.2

12. Inspection of BWR Steam Lines Beyond Isolation Valves:
    Covered by ASME BPV Code, Section XI

13. Independent Check of Primary System Stress Analysis:
    Covered by ASME BPV Code, Section III

14. Operational Stability of Jet Pumps:
Tests and operating experience at Dresden 2 and 3 and other jet pump BWRs have satisfied the ACRS concerns.

15. Pressure Vessel Surveillance of Fluence and NDT Shift:
Covered by 10 CFR 50, Appendix A and Appendix H; and ASTM Standard E-185-70

16. Nil Ductility Properties of Pressure Vessel Materials:
Covered by 10 CFR 50, Appendix A and Appendix G; ASME BPV Code, Section III; ACRS Pressure Vessel Report

17. Operation of Reactor With Less Than All Loops Inservice:
Covered by ACRS-Regulatory Staff position that manual resetting of several set points on the control room instruments under specific conditions and procedures is acceptable in taking one primary loop out of service. This position is based on the expectation that this mode of operation will be infrequent.

18. Criteria for Preoperational Testing:
Covered by Regulatory Guide 1.68

19. Diesel Fuel Capacity:
Covered by ACRS-Regulatory Staff position requiring 7 days fuel*

20. Capability of Biological Shield Withstanding Double-Ended Pipe Break at Safe Ends:
Covered by ACRS-Regulatory Staff position cited in several letters that such a failure should have no unacceptable consequences.

21. Operating One Plant While Other(s) is/are Under Construction:
Specific requirements have been established by ACRS-Regulatory Staff. Position will be prepared.

22. Seismic Design of Steam Lines:
Covered by Regulatory Guide 1.29

23. Quality Group Classifications for Pressure Retaining Components:
Covered by Regulatory Guide 1.26

24. Ultimate Heat Sink:
Covered by Regulatory Guide 1.27

25. Instrumentation to Detect Stresses in Containment Walls:
Covered by Regulatory Guide 1.18

*Regulatory Guide in preparation

Group IA - Generic Items Resolved Since December 18, 1972

1. Use of Sensitized Stainless Steel:
   Covered by Regulatory Guide 1.44

2. Primary system detection and location of leaks:
   Covered by Regulatory Guide 1.45

3. Protection Against Pipe Whip:
   Covered by Regulatory Guide 1.46

4. Anticipated Transients Without Scram:
   Covered by Regulatory Position Document, "Technical Report on Anticipated Transients Without Scram for Water-Cooled Power Reactors", WASH-1270, September, 1973.

5. ECCS capability of current and older plants:
   Covered by Rulemaking as a general policy decision, although acceptable detailed implementation remains to be developed. Docket RM-50-1, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water-Cooled-Nuclear Power Reactors", December 28, 1973.

Group II - Resolution Pending

1. Positive Moderator Coefficient:
   One solution is use of fixed burnable poison in core. Reviews underway.

2. Turbine Missiles:
   Turbine failures for past 16 years have been evaluated and a statistical probability analysis has been completed. An ACRS letter (April 18, 1973) discusses the problem.*

3. Fixed In-Core Detectors on High Power PWRs:
   Some information is available. Further information is required.

4. Performance of Critical Components (pumps, cables, etc.) in Post-LOCA Environment:
   Substantial information available in topical reports. Evaluation is required to determine if all necessary information is on hand.*

5. Effective Operation of Containment Sprays in a LOCA:
   Extensive documentation in topical reports. Review and evaluation are required.

6. Relief Valves Controlling Bypass Paths on BWR Pressure Suppression Containments:
   Analyses made in topical reports. Evaluation required by ACRS-Regulatory Staff.

7. Radwaste Management:
   10 CFR Part 50, Appendix I covers in part.

8. Possible Failure of Pressure Vessel Post-LOCA by Thermal Shock:
   Regulatory Guide 1.2 covers current information. Ultimate position as to significance of thermal shock requires input of fracture mechanics data on irradiated steels from the Heavy Section Steel Technology Program.

9. Instruments to Detect Fuel Failures:
   Instrumentation exists to detect fuel failures: ACRS-Regulatory Staff believes progress is satisfactory; however, continuing work is required.

10. Monitoring for Excessive Vibration or Loose Parts Inside the Pressure Vessel:
    State-of-the-Art results appear promising. More work may be required prior to decision as to installation of equipment.

*A Regulatory Guide is in preparation.

11. Common Mode Failures:
Requirements for diverse components should be established.

12. Emergency Core Cooling System Capability for future plants:
Need for improvement cited in ACRS report of January 7, 1972. Additional cooling capacity should be incorporated into future plant designs.

13. Behavior of Reactor Fuel Under Adnormal Conditions:
This includes: flow blockage; partial melting of fuel assemblies as it affects reactor safety; and transient effects on fuel integrity. The PBF program will address some of these items.

14. Emergency Power for Two or More Reactors at the Same Site:
Additional work is required on protection systems for multiple units.*

15. Main Steam Isolation Valve Leakage of BWRs:
A definitive position is required of ACRS-Regulatory Staff in the light of continuing experience. Note ACRS letters.*

16. Instrumentation to Follow the Course of an Accident:
Some equipment exists; further analyses are required to establish equipment requirements.*

17. BWR Recirculation Pump Overspeed During LOCA:
Topical reports prepared. Decision required by ACRS-Regulatory Staff.

18. The Advisability of Seismic Scram:
Further studies required to establish need.

*A Regulatory Guide is in preparation.

Group IIA - Resolution Pending - Items Added Since December 18, 1972

1. Pressure in containment following LOCA:
   Further criteria and methods are needed to better evaluate local dynamic pressures in a LOCA to establish more definitive design margins.

2. Control Rod Drop/Ejection Accident:
   Calculations indicate that the reactivity response differs from earlier values. New analyses are required. Regulatory Guides are being prepared for BWRs and PWRs.*

3. Fuel Densification:
   This is a facet of Item 13 in Group II, "Behavior of Reactor Fuel Under Abnormal Conditions," and Item 5 in Group IA, "ECCS Capability of Current and Older Plants."

4. Ice Condenser Containments:
   Additional analyses are required to establish response during a LOCA, and to establish design margins.

5. Rupture of High Pressure Lines Outside Containment:
   The possibility exists that failure of a high pressure line such as a steam pipe can prevent operation of critical safety components.*

6. PWR Pump Overspeed During a LOCA:
   Problem arises in similar manner to that of BWRs (Item 17 Group II).

7. Rod Sequence Control Systems:
   Further Evaluation Required to Establish conservatism in both BWRs and PWRs.

8. Isolation of Low Pressure From High Pressure Systems:
   Assurance Required that Low Pressure Systems cannot inadvertently be interconnected with a high pressure system leading to failure. There are potential interaction problems between Class 1 and Class 2 or Class 3 pressure connections.*

9. Steam Generator Tube Leakage:
   Concern primarily related to steam binding due to failure of a critical number or leakage of partially failed tubes during LOCA.*

10. Periodic Review of Older Reactors:
    To assure the adequacy of safety margins on a continuing basis.

11. Effluents from Light-Water Cooled Nuclear Power Reactors:
    To be covered by Formal Rulemaking. Acceptable detailed implementation remains to be developed. This is a facet of Item 7 in Group II, on "Radwaste Management".

*A Regulatory Guide is in preparation.