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

December 18, 1972

Honorable James R. Schlesinger
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

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

Dear Dr. Schlesinger:

The Advisory Committee on Reactor Safeguards and the Regulatory Staff have identified a number of safety problems during recent years that are common to a specific type of light-water reactor or to all light-water reactors (LWRs). The "generic items" discussed herein have been cited in Committee reports pertaining to the construction or operation of LWRs; additional generic items not cited in the report have been identified by the Directorate of Licensing. The ACRS customarily has used a general paragraph to cover those generic items noted in its previous reports. This paragraph reads: "Other problems relating to large water reactors, which have been identified by the Regulatory Staff and the ACRS and cited in previous reports, should be dealt with appropriately by the Regulatory Staff and the applicant as suitable approaches are developed". The use of such a paragraph has permitted the ACRS to emphasize either new or particularly significant generic problems without listing in detail those problems cited in the past.

The Committee believes that many of the generic items cited in its reports have been resolved by actions of the applicants or decisions of the Regulatory Staff, in cooperation with the ACRS. Resolution of the remaining items are pending.

The Committee defines "resolved" to mean 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. 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.

Group I of the attachment includes generic problems that have been resolved together with the specific action that resulted in the resolution. Group II includes those items for which resolution on a generic basis is still pending. The ACRS and the Regulatory Staff will continue to consider Group II 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 Safety Guides, are anticipated for many of the Group II items.

The ACRS expects to report to you from time to time on the status of generic items.

Sincerely yours,

/s/

C. P. Siess
Chairman

Attachment:
Generic Items

GENERIC ITEMS

Group I - Resolved Generic Items

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

2. Emergency Power:
   Covered by Safety Guides 6 and 9 and portions of IEEE-308 (1971)

3. Hydrogen Control After a Loss-of-Coolant Accident (LOCA):
   Covered by Safety Guide 7 and Supplement

4. Instrument Lines Penetrating Containment:
   Covered by Safety Guide 11 and Supplement

5. Strong Motion Seismic Instrumentation:
   Covered by Safety Guide 12

6. Fuel Pool Design Bases:
   Covered by Safety Guide 13

7. Protection of Primary System and Engineered Safety Features Against Pump Flywheel Missiles:
   Covered by Safety Guide 14

8. Protection Against Industrial Sabotage:
   Covered by Safety Guide 17

9. Vibration Monitoring of Reactor Internals and Primary System:
   Covered by Safety Guide 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; Safety Guide 28; 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 Sytem 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 for this generation plant.

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

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

17. Operation of Reactor With Less Than All Loops in Service:
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 Operational Guide for the Planning of Initial Startup Programs, December 7, 1970

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. ACRS-Regulatory Staff position document will be prepared.

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 Safety Guide 29

23. Quality Group Classifications for Pressure Retaining Components:
Covered by Safety Guide 26

24. Ultimate Heat Sink:
Covered by Safety Guide 27

25. Instrumentation to Detect Stresses in Containment Walls:
Covered by Safety Guide 18

Group II - Resolution Pending

1. Adequacy of Primary System Leak Detection and Location:

   ACRS-Regulatory Staff position requires systems in addition to sump measurements.

2. Positive Moderator Coefficient:

   One solution is use of fixed burnable poison in core.

3. Use of Sensitized Stainless Steel:

   ACRS-Regulatory Staff position is to minimize use.*

4. Protection Against Pipe Whip:

   Ultimate decision will depend on review of available information on pipe break probabilities.*

5. Turbine Missiles:

   Turbine failures for past 16 years have been evaluated and a statistical probability analysis has been completed.

6. Fixed In-Core Detectors on High Power PWRs:

   Some information is available.

7. 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.*

8. Effective Operation of Containment Sprays in a LOCA:

   Extensive documentation in topical reports. Review and evaluation are required.

9. Relief Valves Controlling Bypass Paths on BWR Pressure Suppression Containments:

   Analyses made in topical reports. Evaluation required by ACRS-Regulatory Staff.

---

* A Safety Guide is in preparation.

10. Anticipated Transients Without Scram:

    Data provided by applicants. Evaluation is required to permit a decision to cover BWRs and PWRs operating and under construction.

11. Radwaste Management:

    10 CFR 50, Appendix I, covers in part: Formal rulemaking decision required to implement fully.

12. Possible Failure of Pressure Vessel Post-LOCA by Thermal Shock:

    Safety Guide 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.

13. Instruments to Detect Fuel Failures:

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

14. 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.

15. Common Mode Failures:

    Requirements for diverse components should be established.

16. Emergency Core Cooling System Capability:

    Need for improvement cited by Regulatory Staff and stated in ACRS report of January 7, 1972. Further studies and evaluations are in progress.

17. Behavior of Reactor Fuel Under Abnormal 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.

18. Emergency Power for Two or More Reactors at the Same Site:

    Additional work is required on protection systems for multiple units.

19. Main Steam Isolation Valve Leakage of BWRs:

    A definitive position is required of ACRS-Regulatory Staff in the light of continuing experience.

20. Instrumentation to Follow the Course of an Accident:

    Some equipment exists; further analyses are required to establish equipment requirements.

21. BWR Recirculation Pump Overspeed During LOCA:

    Topical reports prepared. Decision required by ACRS-Regulatory Staff.

22. The Advisability of Seismic Scram:

    Further studies required to establish need.