UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

December 13, 1979

Honorable John F. Ahearne
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: REPORT ON TMI-2 LESSONS LEARNED TASK FORCE FINAL REPORT

Dear Dr. Ahearne:

The TMI-2 Lessons Learned Task Force has issued its Final Report, NUREG-0585. The ACRS provides comments herein both on the specific recommendations made by the Task Force and on related subjects. The Committee will first address the recommendations made in NUREG-0585.

1. Personnel Qualifications and Training.

The ACRS gives general support to the recommendations made in this category.

The ACRS believes that, although a broader technical background should be required of Shift Supervisors, it may be neither necessary nor practical to require that all Shift Supervisors have a Bachelor of Science Degree. The Committee recommends that the NRC define its criteria for "equivalent training and experience in engineering or the related physical sciences." The ACRS believes that a training program tailored to the requirements of reactor operation, possibly of less than four years duration, may provide a practical alternative to a formal degree program. The Committee believes that the NRC should define the scope and duration of a training program that may be considered as an acceptable alternative to a degree curriculum. The ACRS also recommends that, if the Technical Advisor system proves satisfactory, consideration should be given to offering licensees the option of retaining that system instead of upgrading the academic education of Shift Supervisors to the specified level.

The ACRS recommends that the adequacy of staffing in the NRC Operator Licensing Branch be reevaluated with respect to the number of personnel and breadth of their background.

The Committee believes that additional emphasis must be given to the determination of what constitutes an adequate degree of in-house technical capability for each licensee and assurance of the continuing development of such capabilities. The ACRS also believes that attention must be given to providing, on a continuing basis, technical backup to review safety-related design changes or to provide assistance under

accident conditions by a group having the depth of technical knowledge which exists in the organization of the nuclear steam system supplier and a well-qualified architect-engineer during the period while the plant is being designed.

2. Staffing of Control Room.

   The ACRS supports this recommendation.

3. Working Hours.

   The ACRS supports this recommendation.

4. Emergency Procedures.

   The ACRS, in general, gives strong support to this recommendation. However, the Committee believes that the emergency procedures at licensed power reactors should receive priority. The ACRS recommends that the licensees should give priority to the development of improved emergency procedures with the aid of expert, interdisciplinary review groups and that the NRC Staff should review, in depth, the existing and proposed, emergency procedures for a large sample of licensed reactors on a priority basis.

   The knowledge developed from the concurrent industry and NRC efforts should be used to revise, in a timely fashion, the emergency procedures of all operating plants.

5. Verification of Correct Performance of Operating Activities.

   The ACRS gives general support to this recommendation.

6. Evaluation of Operating Experience.

   The ACRS gives general support to these recommendations.

   Additional Committee comments on this subject are contained in NUREG-0572, "Review of Licensee Event Reports (1976-1978)."

7. Man-Machine Interface.

   The ACRS gives general support to these recommendations.

   In addition to the nine items listed in NUREG-0585, Appendix A, Section 7.1 , the Committee recommends that the licensee should include in his evaluation the data recording requirements and recall capabilities of the minimum set of plant parameters that defines the safety status of a nuclear power plant.

8. Reliability Assessments of Final Designs.

The ACRS strongly supports the application of reliability assessments to final designs. The Committee supports the Integrated Reliability Evaluation Program (IREP) which is being initiated by the Office of Nuclear Regulatory Research. However, the Committee does not agree that the proposed IREP will fully satisfy the need. The ACRS recommends that the NRC develop a program in which licensees acting individually or jointly develop reliability assessments of their plants, in addition to the NRC IREP, which should be performed concurrently.

If the reliability assessments were performed in the manner proposed above, it would accelerate obtaining potentially significant safety information and expedite the development of the basis for changes, should they be necessary. It would also provide the operating organizations with better technical insight into the safety of their plants and would provide the benefits to be derived by separate studies of system reliability.

9. Review of Safety Classifications and Qualifications.

The ACRS supports this recommendation. A particular problem warranting early attention is the qualification of operator information systems. More generally, the Committee believes that more than a year will be needed to accomplish the overall task, partly because of its breadth and depth, and partly because of the very considerable number of knowledgeable personnel which would be needed.

The Committee agrees that completion of the overall task should not be made a condition for the licensing of new plants.

10. Design Features for Core-Damage and Core-Melt Accidents.

The ACRS supports this recommendation. However, the Committee believes that the recommendation should be augmented to require concurrent design studies by each licensee of possible hydrogen control and filtered venting systems which have the potential for mitigation of accidents involving large scale core damage or core melting, including an estimate of the cost, the possible schedule, and the potential for reduction in risk.

The ACRS agrees with the recommendation made by the Lessons Learned Task Force in NUREG-0578 that the Mark I and Mark II BWR containments should be inerted while further studies are made of other possible containment modifications in accordance with the general recommendations in this category. The ACRS also recommends that special attention be given to making a timely decision on possible interim measures for ice-condenser containments.

The Committee also recommends that special attention be given to operating reactors located at densely populated sites.

11. Safety Goal for Reactor Regulation.

The ACRS supports this recommendation.

12. Staff Review Objectives.

The ACRS supports this recommendation. However, the ACRS believes that there is a need for review of NRC safety rules, regulations, guides and philosophy on a regular basis in order to ascertain various matters including the following:

a. Does an appropriate balance exist in the expenditure of NRC financial and manpower resources among the various research areas, on the resolution of safety issues, on the legal requirements of licensing, and on inspection and enforcement?

b. Is there an appropriate division of effort and responsibility between industry and the NRC?

c. Has an undesirable inflexibility in the approach to safety developed due to previous decisions, or for other reasons?

d. Are there any important gaps in the existing safety review process? Is there a mechanism for searching out such gaps?

13. NRR Emergency Response Team.

The ACRS gives general support to these recommendations. The Committee believes that the timing of implementation should be more flexible. The Committee believes that better definition of the NRC role and responsibilities in an emergency will have an influence on the determination of the makeup, training and abilities of an NRC emergency response team.

The ACRS wishes to make some comments and recommendations on several matters not directly addressed in NUREG-0578 or NUREG-0585.

1. The ACRS believes that the lessons learned from the TMI accident should be viewed in a broader perspective. The Committee agrees that the TMI accident shows a need for considerable improvement

in reactor operations and in knowledge of the behavior of a plant during a wide range of transients. However, the Committee believes that there are other potentially important contributors to the probability of a reactor accident, and they should also receive priority attention.

Reliability assessments and systems interactions studies, as discussed under recommendations 8 and 9 above, should serve this function in part. However, there is a need also to consider, in some more systematic way, methods to uncover significant design errors, to detect system or component degradation, and to test systems under conditions more closely simulating the range of situations which might result from transients and accidents.

2. The Task Force has not addressed the need to reexamine the adequacy of the current design basis for emergency cooling recirculating systems, as recommended by the ACRS in its report of August 14, 1979 on "Studies to Improve Reactor Safety."

   There are several other specific recommendations made by the ACRS in its interim reports Nos. 2 and 3 on Three Mile Island both dated May 16, 1979 and in its report of August 14, 1979 on studies to improve reactor safety. The Committee believes that the NRC Staff should address each such recommendation in formulating its overall action plan.

3. The ACRS recommends that a reevaluation should be made of the potential influence of a serious accident involving significant atmospheric release of radioactive materials from one unit of a multiple unit site on the ability to maintain the other units in a safe shutdown condition.

4. The ACRS recommends that the industry and the NRC Staff undertake studies to ascertain what contingency design measures, beyond those covered in the Task Force recommendations, may ensure improved capabilities for recovering from or mitigating the effects of accidents beyond the design basis. For example, in some cases, it may be possible to provide alternative measures in the event of loss of the safety grade ultimate heat sink for an extended period of time.

5. The ACRS recommends that the NRC Staff give attention to the seismic implications of TMI, for example, the seismic qualifications of auxiliary feedwater supplies, the acceptability of failure of nonseismic Class 1 equipment, and the suitability of emergency procedures for earthquakes.

6. The ACRS recommends that greater consideration be given to the provision of dedicated shutdown heat removal sytems, and to the potential merits of having a shutdown heat removal system capable of operating at normal system pressure.

The ACRS expects to address other considerations of reactor safety and the regulatory process in a separate report.

Sincerely,

Max W. Carbon
Chairman