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# NRC Action Plan Developed as a Result of the TMI-2 Accident

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U.S. Nuclear Regulatory  
Commission



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# NRC Action Plan Developed as a Result of the TMI-2 Accident

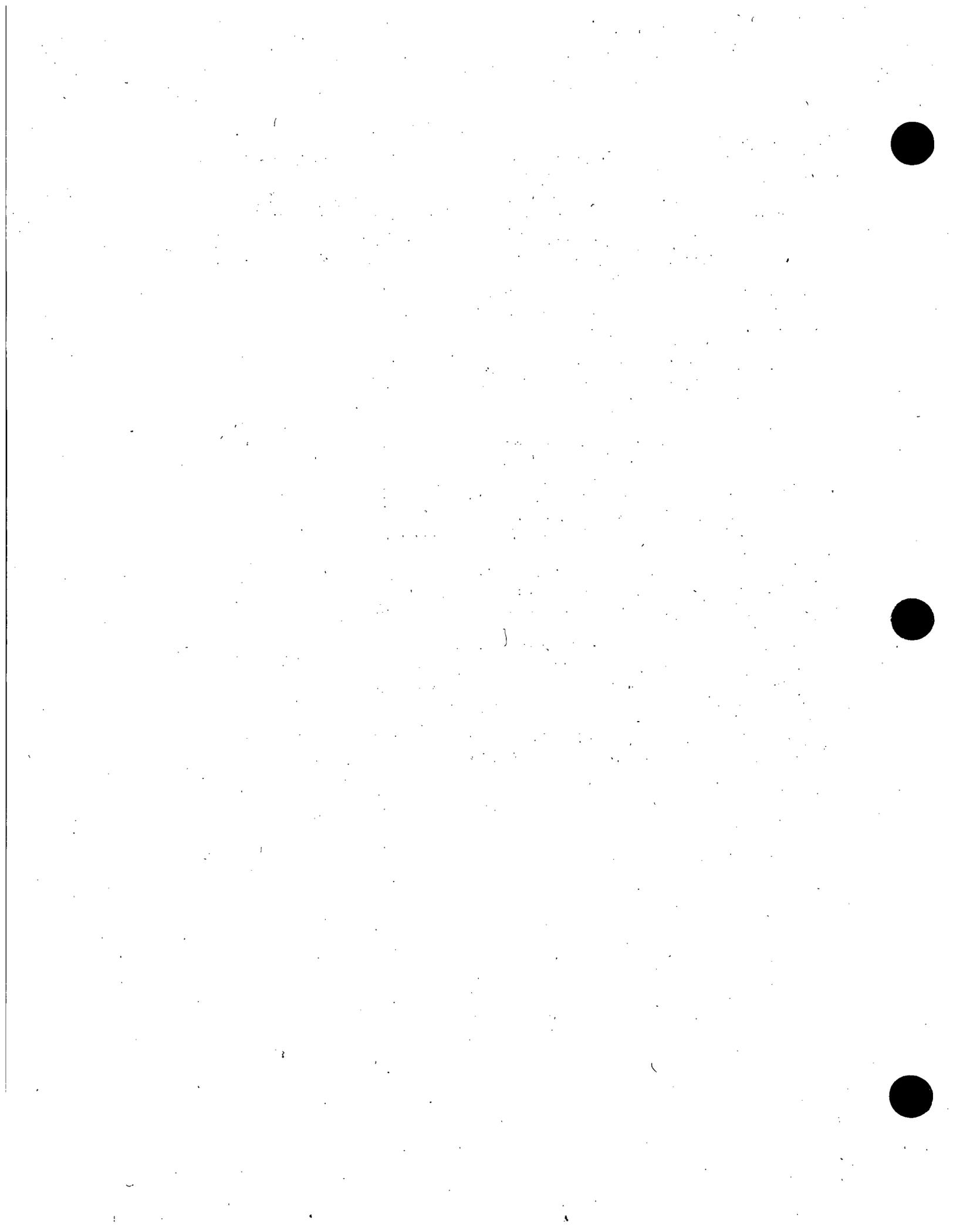
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**Washington, D.C. 20555**





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## INTRODUCTION

The tables included in this volume list the recommendations from the various organizations and task forces investigating the accident at Three Mile Island. The tables are annotated to provide easy references to the associated parts of the Action Plan in Volume 1. The tables are also annotated to provide a shorthand indication of how the various recommendations are treated in the Action Plan. The explanations for those notations are provided at the beginning of each table.

This volume also includes a point-by-point comparison of the items in Volume 1 with the President's Statement of December 7, 1979, in response to the recommendations of the President's Commission on the accident at Three Mile Island.

This volume also contains a point-by-point response to the comments on draft 2 of the plan by the Atomic Industrial Forum, including a description of where and how the plan was changed as a result of those comments. Finally, this volume contains a cross reference of the Action Plan to the Commission actions on the major NRC staff paper on reactor operator qualifications and licensing (SECY-79-330E).

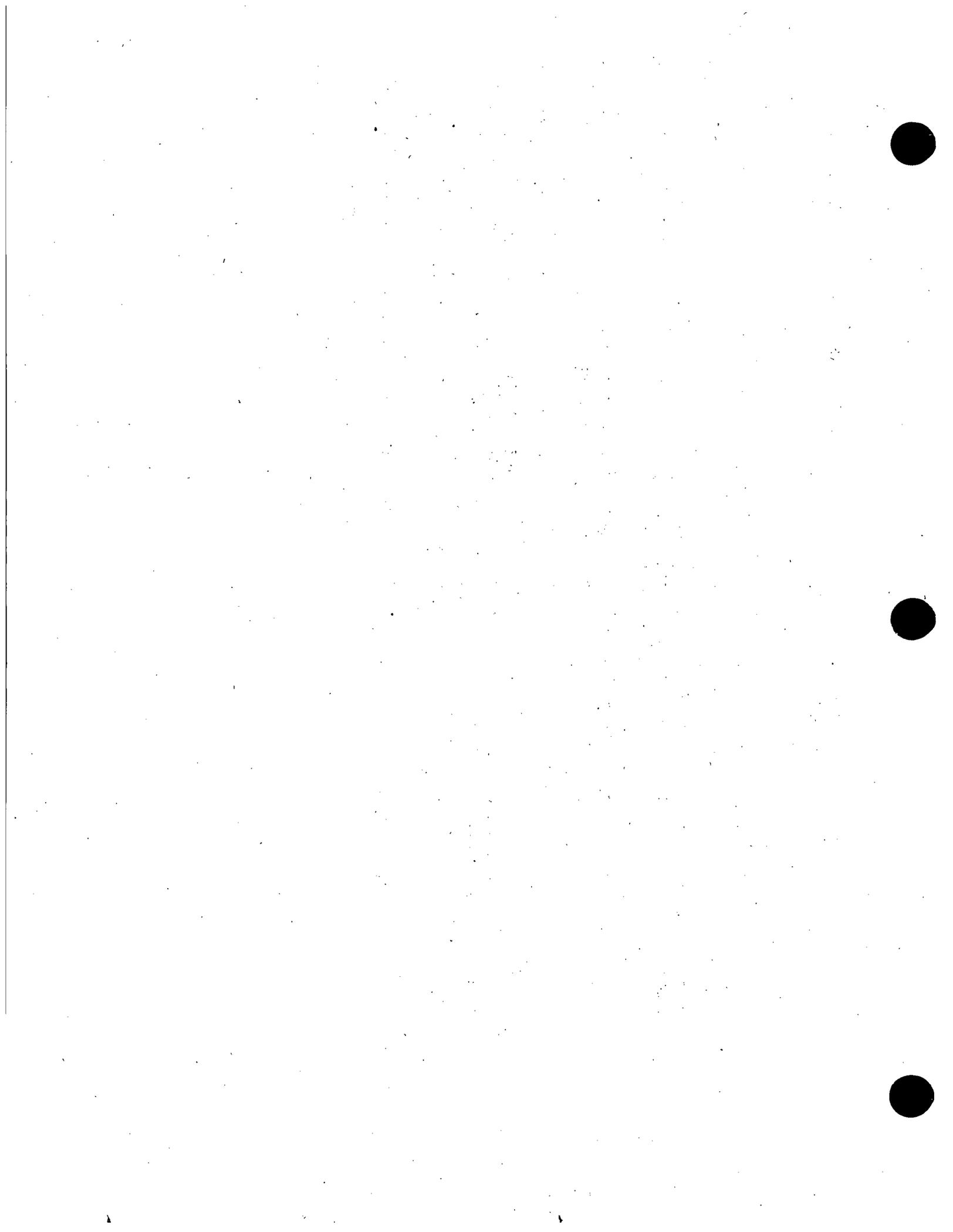


COMPARISON OF RECOMMENDATIONS OF THE PRESIDENT'S COMMISSION IN THEIR REPORT DATED OCTOBER 1979  
WITH THE TMI ACTION PLAN (NUREG-0660)

Status of recommendation in the Action Plan:

- a. Recommendation is adequately covered in the Action Plan.
- b. This recommendation (or some part thereof) may not be explicitly included in the Action Plan but it is intended that, when the action is undertaken by the lead office, this specific recommendation by the President's Commission will be taken into consideration.
- c. Staff or Commission do not agree with the recommendation or the recommendation is beyond the purview of the NRC. The action plan was not changed to account for this recommendation.

1 Note: The enclosed list includes cross-references to similar recommendations made by (a) the  
3 President's Commission, and (b) the NRC's Special Inquiry Group (SIG). For example, a  
1 parenthetical note such as (see recommendation D.1) refers to another recommendation  
within the enclosed list, and a note such as (SIG-F.1.a) refers to a recommendation  
in the list of recommendations for Volume I of the report of NRC's Special Inquiry Group.



RECOMMENDATIONS OF THE PRESIDENT'S COMMISSION

RELATED TMI  
ACTION PLAN TASK

STATUS IN THE  
ACTION PLAN

A. THE NUCLEAR REGULATORY COMMISSION

1. The Nuclear Regulatory Commission should be restructured as a new independent agency in the executive branch. (SIG-E.1)

a. The present five-member commission should be abolished.

None

c (beyond NRC purview)

b. The new agency should be headed by a single administrator appointed by the President, subject to the advice and consent of the Senate, to serve a substantial term (not coterminous with that of the President) in order to provide an expectation of continuity, but at the pleasure of the President to allow removal when the President deems it necessary. The administrator should be a person from outside the present agency.

None

c (beyond NRC purview)

c. The administrator should have substantial discretionary authority over the internal organization and management of the new agency, and over personnel transfers from the existing NRC. (SIG-E.1.a) Unlike the present NRC arrangement, the administrator and major staff components should be located in the same building or group of buildings. (SIG-E.8)

V.13,  
V.15,  
V.16

a

d. The major role of the administrator should be assuring that offices within the agency communicate sufficiently so that research, operating experience, and inspection and enforcement affect the overall performance of the agency.

V.11  
V.12

a

2. An oversight committee on nuclear reactor safety should be established. Its purpose would be to examine, on a continuing basis, the performance of the agency and of the nuclear industry in addressing and resolving important public safety issues associated with the construction and operation of nuclear power plants, and in exploring the overall risks of nuclear power. (SIG-A.2)

None

c (beyond NRC purview)

RECOMMENDATIONS OF THE PRESIDENT'S COMMISSION

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a. The members of the committee, not to exceed 15 in number, should be appointed by the President and should include: persons conversant with public health, environmental protection, emergency planning, energy technology and policy, nuclear power generation, and nuclear safety; one or more state governors; and members of the general public.

None

c (beyond NRC purview)

b. The committee, assisted by its own staff, should report to the President and to Congress at least annually.

None

c (beyond NRC purview)

3. The Advisory Committee on Reactor Safeguards (ACRS) should be retained, in a strengthened role, to continue providing an independent technical check on safety matters. The members of the committee should continue to be part-term appointees; the Commission believes that the independence and high quality of the members might be compromised by making them full-time federal employees. The Commission recommends the following changes: (SIG-H.1)

V.3

a

a. The staff of ACRS should be strengthened to provide increased capacity for independent analysis. Special consideration should be given to improving ACRS; capabilities in the field of public health.

V.3

a

b. The ACRS should not be required to review each license application. When ACRS chooses to review a license application, it should have the statutory right to intervene in hearings as a party. In particular, ACRS should be authorized to raise any safety issue in licensing proceedings, to give reasons and arguments for its views, and to require formal response by the agency to any submission it makes. Any member of ACRS should be authorized to appear and testify in hearings, but should be exempt from subpoena in any proceedings in which he has not previously appeared voluntarily or made an individual written submission.

V.3

a

c. ACRS should have similar rights in rulemaking proceedings. In particular, it should have the power to initiate a rulemaking proceeding before the agency to resolve any generic safety issue it identifies.

V.3

a

RECOMMENDATIONS OF THE PRESIDENT'S COMMISSION

4. Included in the agency's general substantive charge should be the requirement to establish and explain safety-cost trade-offs; where additional safety improvements are not clearly outweighed by cost considerations, there should be a presumption in favor of the safety change. (SIG-A.1, H.8.b) Transfers of statutory jurisdiction from the NRC should be preceded by a review to identify and remove any unnecessary responsibilities that are not germane to safety. (SIG-E.7) There should also be emphasis on the relationship of the new agency's safety activities to related activities of other agencies. (see recommendations F.2 and F.1.a) (SIG-K.1, G.4.b)

a. The agency should be directed to upgrade its operator and supervisor licensing functions. These should include the accreditation of training institutions from which candidates for a license must graduate. Such institutions should be required to employ qualified instructors, to perform emergency and simulator training, and to include instruction in basic principles of reactor science, reactor safety, and the hazards of radiation. The agency should also set criteria for operator qualifications and background investigations, and strictly test license candidates for the particular power plant they will operate. The agency should periodically review and reaccredit all training programs and relicense individuals on the basis of current information or experience in reactor operations. (see recommendations C.1 and C.2) (SIG-C.1, 2)

b. The agency should be directed to employ a broader definition of matters relating to safety that considers thoroughly the full range of safety matters, including, but not limited to, those now identified as "safety-related" items, which currently receive special attention. (SIG-A.1, H.10.a)

RELATED TMI  
ACTION PLAN TASK

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ACTION PLAN

V.1,  
V.2,  
IV.E.1

a

I.A.2.1,  
I.A.2.2,  
I.A.2.3,  
I.A.2.6,  
I.A.2.7,  
I.A.3.1,  
I.A.3.2,  
I.A.3.3,  
I.A.4.1,  
I.A.4.2

a

I.F.1,  
I.F.2  
II.C (all sections)  
II.E.1, II.E.5,  
II.F.5

a

RECOMMENDATIONS OF THE PRESIDENT'S COMMISSION

RELATED TMI      STATUS IN THE  
ACTION PLAN TASK      ACTION PLAN

c. Other safety emphases should include:

(i) A systems engineering examination of overall plant design and performance, including interaction among major systems and increased attention to the possibility of multiple failures; (SIG-H.10.a)

I.C.1      a  
II.C (all sections)  
V.11

(ii) Review and approval of control room design; the agency should consider the need for additional instrumentation and for changes in overall design to aid understanding of plant status, particularly for response to emergencies; (see recommendation D.1) and (SIG-F.1,2)

I.D (all sections)      a  
II.F.1  
II.F.2  
II.F.3

(iii) An increased safety research capacity with a broadly defined scope that includes issues relevant to public health. It is particularly necessary to coordinate research with the regulatory process in an effort to assure the maximum application of scientific knowledge in the nuclear power industry.

III.D.3.5,      b  
IV.H

5. Responsibility and accountability for safe power plant operations, including the management of a plant during an accident, should be placed on the licensee in all circumstances. (SIG-C.3) It is therefore necessary to assure that licensees are competent to discharge this responsibility. To assure this competency, and in light of our findings regarding Metropolitan Edison, we recommend that the agency establish and enforce higher organizational and management standards for licensees. Particular attention should be given to such matters as the following: integration of decision-making in any organization licensed to construct or operate a plant; kinds of expertise that must be within the organization; financial capability; quality assurance programs; operator and supervisor practices and their periodic reevaluation; plant surveillance and maintenance practices; and requirements for the analysis and reporting of unusual events.

I.B.1.1,      a  
I.B.1.2,  
II.J.3,  
III.D.3.1  
I.A.1.1, I.A.2.1,  
I.A.2.2, I.A.2.3,  
I.A.2.6, I.A.2.7,  
I.A.3.1, I.C.6,  
I.F.1, I.F.2,  
I.E.6, IV.F.1,  
IV.F.2

RECOMMENDATIONS OF THE PRESIDENT'S COMMISSION

RELATED TMI ACTION PLAN TASK      STATUS IN THE ACTION PLAN

6. In order to provide an added contribution to safety, the agency should be required, to the maximum extent feasible, to locate new power plants in areas remote from concentrations of population. Siting determinations should be based on technical assessments of various classes of accidents that can take place, including those involving releases of low doses of radiation. (see recommendation F.2.) (SIG-G.1.a, G.2.i)

II.A (all sections)      b  
II.B.6  
II.B.8

7. The agency should be directed to include, as part of its licensing requirements, plans for the mitigation of the consequences of accidents, including the cleanup and recovery of the contaminated plant. The agency should be directed to review existing licenses and to set deadlines for accomplishing any necessary modifications. (see recommendations D.2 and D.4) (SIG-H.10.d)

II.B.1, II.B.2,      a  
II.B.3, II.B.4,  
II.B.5, II.B.8

8. Because safety measures to afford better protection for the affected population can be drawn from the high standards for plant safety recommended in this report, the NRC or its successor should, on a case-by-case basis, before issuing a new construction permit or operating license: (SIG-A.4.a)

a. Assess the need to introduce new safety improvements recommended in this report, and in NRC and industry studies;

IV.E,      a  
entire plan

b. Review, considering the recommendations set forth in this report, the competency of the prospective operating licensee to manage the plant and the adequacy of its training program for operating personnel; and

I.A.2.1, I.A.2.2,      a  
I.A.2.3, I.A.3.1,  
I.B.1.1, I.B.1.2,  
I.G.1

c. Condition licensing upon review and approval of the state and local emergency plans.

III.A.2(both sections) a  
III.B (both sections)

RECOMMENDATIONS OF THE PRESIDENT'S COMMISSION

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Agency Procedures

The Commission believes that the agency must improve on prior performance in resolving generic and specific safety issues. Generic safety issues are considered in rulemaking proceedings that formulate new standards for categories of plants. Specific safety issues are considered in adjudicative proceedings that determine whether a particular plant should receive a license. Both kinds of safety issues are then dealt with in inspection and enforcement processes. The Commission believes that all of these agency functions need improvement, and accordingly recommends the following measures:

9. The agency's authorization to make general rules affecting safety should: (SIG-H.5.c)

a. Require the development of a public agenda according to which rules will be formulated;

IV.G.1

a

b. Require the agency to set deadlines for resolving generic safety issues;

IV.E.2,  
IV.E.3

a

c. Require a periodic and systematic reevaluation of the agency's existing rules; and

IV.G.2

a

d. Define rulemaking procedures designed to create a process that provides a meaningful opportunity for participation by interested persons, that ensures careful consideration and explanation of rules adopted by the agency, and that includes appropriate provision for the application of new rules to existing plants. In particular, the agency should: accompany newly proposed rules with an analysis of the issues they raise and provide an indication of the technical materials that are relevant; provide a sufficient opportunity for interested persons to evaluate and rebut materials relied on by the agency or submitted by others; explain its final rules fully, including responses to principal comments by the public, the ACRS, and other agencies on proposed rules; impose when necessary

IV.G.3,  
IV.G.4,  
V.4,  
V.5

a

RECOMMENDATIONS OF THE PRESIDENT'S COMMISSION

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special interim safeguards for operating plants affected by generic safety rulemaking; and conduct systematic reviews of operating plants to assess the need for retroactive application of new safety requirements.

10. Licensing procedures should foster early and meaningful resolution of safety issues before major financial commitments in construction can occur. In order to ensure that safety receives primary emphasis in licensing, and to eliminate repetitive consideration of some issues in that process, the Commission recommends the following:

a. Duplicative consideration of issues in several stages of one's plant licensing should, wherever possible, be reduced by allocating particular issues (such as the need for power) to a single stage of the proceedings. (SIG-H.3.a)

b. Issues that recur in many licensings should be resolved by rulemaking. (SIG-H.5.a)

c. The agency should be authorized to conduct a combined construction permit and operating license hearing whenever plans can be made sufficiently complete at the construction permit stage. (SIG-H.3.a)

d. There should be provision for the initial adjudication of license applications and for appeal to a board whose decisions would not be subject to further appeal to the administrator. Both initial adjudications and appeal boards should have a clear mandate to pursue any safety issue, whether or not it is raised by a party. (SIG-H.4.b)

e. An Office of Hearing Counsel should be established in the agency. This office would not engage in the information negotiations between other staff and applicants that typically precede formal hearings as an objective party, seeking to assure that vital safety issues are addressed and resolved. The office should report directly to the administrator and should be empowered to appeal any adverse licensing board determination to the appeal board. (SIG-H.6)

IV.E.2,  
IV.E.3

V.9,  
IV.E.3

IV.E.4

V.9

V.17

V.5

a

a

a

b

a

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f. Any specific safety issue left open in licensing proceedings should be resolved by a deadline.

V.6      a

11. The agency's inspection and enforcement functions must receive increased emphasis and improved management, including the following elements:

a. There should be an improved program for the systematic safety evaluation of currently operating plants, in order to assess compliance with current requirements, to assess the need to make new requirements retroactive to older plants, and to identify new safety issues. (SIG-B.1.a)

I.B.2.3,      a  
I.B.2.4,  
I.E.3,  
II.J.4,  
IV.E

b. There should be a program for the systematic assessment of experience in operating reactors, with special emphasis on discovering patterns in abnormal occurrences. An overall quality assurance measurement and reporting system based on this systematic assessment shall be developed to provide: (1) a measure of the overall improvement or decline in safety, and (2) a base for specific programs aimed at curing deficiencies and improving safety. Licensees must receive clear instructions on reporting requirements and clear communications summarizing the lessons of experience at other reactors. (SIG-B.1.a, B.2.d)

I.B.2.3,      a  
I.B.2.4,  
I.E.3,  
I.E.6,  
I.A.1.1,  
I.B.1.1,  
I.B.1.2

c. The agency should be authorized and directed to assess substantial penalties for licensee failure to report new "safety-related" information or for the violations of rules defining practices or conditions already known to be unsafe.

IV.A (all sections)      a

d. The agency should be directed to require its enforcement personnel to perform improved inspection and auditing of license compliance with regulations and to conduct major and unannounced on-site inspections of particular plants. (SIG-B.3.a)

I.B.2 (all sections)      a  
II.J.1 (all sections)  
II.J.2 (all sections)

RECOMMENDATIONS OF THE PRESIDENT'S COMMISSION

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e. Each operating licensee should be subject periodically to intensive and open review of its performance according to the requirements of its license and applicable regulations. (SIG-B.3.a)

I.B.2.3,      a  
I.B.2.4,  
IV.E.5

f. The agency should be directed to adopt criteria for revocation of licenses, sanctions short of revocation such as probationary status, and kinds of safety violations requiring immediate plant shutdown or other operational safeguards.

IV.A.1,      a  
IV.A.2  
I.B.1.3

B. THE UTILITY AND ITS SUPPLIERS

1. To the extent that the industrial institutions we have examined are representative of the nuclear industry, the nuclear industry must dramatically change its attitudes toward safety and regulations. The Commission has recommended that the new regulatory agency prescribe strict standards. At the same time, the Commission recognizes that merely meeting the requirements of a government regulation does not guarantee safety. Therefore, the industry must also set and police its own standards of excellence to ensure the effective management and safe operation of nuclear power plants.

a. The industry should establish a program that specifies appropriate safety standards including those for management, quality assurance, and operating procedures and practices, and that conducts independent evaluations. The recently created Institute of Nuclear Power Operations, or some similar organization, may be an appropriate vehicle for establishing and implementing this program. (SIG-B.4.a)

I.A.2.6,      a  
I.A.3.5,  
I.B.1.1  
I.F.2

b. There must be a systematic gathering, review, and analysis of operating experience at all nuclear power plants coupled with an industry-wide international communications network to facilitate the speedy flow of this information to affected parties. If such experiences indicate the need for modifications in design or operation, such changes should be implemented according to realistic deadlines. (SIG-B.1.b)

I.E (all sections)      a  
I.B.2.3,  
I.B.2.4,  
I.C.5

RECOMMENDATIONS OF THE PRESIDENT'S COMMISSION

RELATED TMI ACTION PLAN TASK      STATUS IN THE ACTION PLAN

2. Although the Commission considers the responsibility for safety to be with the total organization of the plant, we recommend that each nuclear power plant company have a separate safety group that reports to high-level management. Its assignment would be to evaluate regularly procedures and general plant operations from a safety perspective; to assess quality assurance programs; and to develop continuing safety programs.

I.B.1.1,      a  
I.B.1.2

3. Integration of management responsibility at all levels must be achieved consistently throughout this industry. Although there may not be a single optimal management structure for nuclear power plant operations, there must be a single accountable organization with the requisite expertise to take responsibility for the integrated management of the design, construction, operation, and emergency response functions, and the organizational entities that carry them out. Without such demonstrated competence, a power plant operating company should not qualify to receive an operating license.

I.B.1.1, I.B.1.2,      a  
II.J.3,  
III.A.1.1,  
III.A.2.2

a. These goals may be obtained at the design stage by (1) contracting for a "turn-key" plant in which the vendor or architect-engineer contracts to supply a fully operational plant and supervises all planning, construction, and modification; or (2) assembling expertise capable of integrating the design process. In either case, it is critical that the knowledge and expertise gained during design and construction of the plant be effectively transferred to those responsible for operating the plant.

II.J.3.1,      a  
I.B.1.1

b. Clearly defined roles and responsibilities for operating procedures and practices must be established to ensure accountability and smooth communication. (SIG-A.4.a)

I.B.1.1, I.B.1.2,      a  
I.C.2, I.C.3,  
I.C.4, I.C.9

c. Since, under our recommendations, accountability for operations during an emergency would rest on the licensee, the licensee must prepare clear procedures defining management roles and responsibilities in the event of a crisis.

I.B.1.1, I.B.1.2,      a  
I.C.3, I.C.4, I.C.9,  
III.A.1.1, III.A.1.2,  
III.A.2.2

RECOMMENDATIONS OF THE PRESIDENT'S COMMISSION

4. It is important to attract highly qualified candidates for the positions of senior operator and operator supervisor. Pay scales should be high enough to attract such candidates.

5. Substantially more attention and care must be devoted to writing, reviewing, and monitoring of plant procedures.

a. The wording of procedures must be clear and concise.

b. The content of procedures must reflect both engineering thinking and operating practicalities.

c. The format of procedures, particularly those that deal with abnormal conditions and emergencies, must be especially clear, including clear diagnostic instructions for identifying the particular abnormal conditions confronting the operators.

d. Management of both utilities and suppliers must insist on the early diagnosis and resolution of safety questions that arise in plant operations. They must also establish deadlines, impose sanctions for the failure to observe such deadlines, and make certain that the results of the diagnoses and any proposed procedural changes based on them are disseminated to those who need to know them.

6. Utility rate-making agencies should recognize that implementation of new safety measures can be inhibited by delay or failure to include the costs of such measures in the utility rate base. The Commission, therefore, recommends that state rate-making agencies give explicit attention to the safety implications of rate-making when they consider costs based on "safety-related" changes. (SIG-K.2.a)

<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS IN THE ACTION PLAN</u>
I.A.2 (all sections), I.B.1.1	c (pay scale beyond NRC purview; alternate actions for qualifications of operators)
I.C.9	a
I.C.9	a
I.C.2, I.C.5, I.C.9	a
I.C.1, I.C.7, I.C.8, I.C.9	a
I.A.1.1, I.B.1.1, I.B.1.2, I.C.5, I.E.3, I.E.4	b
IV.F.2	b

RECOMMENDATIONS OF THE PRESIDENT'S COMMISSION

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C. TRAINING OF OPERATING PERSONNEL

1. The Commission recommends the establishment of agency-accredited training institutions for operators and immediate supervisors of operators. These institutions should have highly qualified instructors, who will maintain high standards, stress understanding of the fundamentals of nuclear power plants and the possible health effects of nuclear power, and who will train operators to respond to emergencies. (see recommendation A.4.a) (SIG-C.1.b)

I.A.2.7,  
I.A.3.5

b

a. These institutions could be national, regional, or specific to individual nuclear steam systems.

I.A.2.7

b

b. Reactor operators should be required to graduate from an accredited training institution. Exemption should be made only in cases where there is clear, documentary evidence that the candidate already has the equivalent training.

I.A.2.7

b

c. The training institutions should be subject to periodic review and reaccreditation by the restructured NRC.

I.A.2.7

b

d. Candidates for the training institute must meet entrance requirements geared to the curriculum.

I.A.2.7

b

2. Individual utilities should be responsible for training operators who are graduates of accredited institutions in the specifics of operating a particular plant. These operators should be examined and licensed by the restructured NRC, both at their initial licensing and at the relicensing stage. In order to be licensed, operators must pass every portion of the examination. Supervisors of operators, at a minimum, should have the same training as operators.

I.A.3.1,  
I.A.2.1,  
I.A.2.2,  
I.A.2.6

b

3. Training should not end when operators are given their licenses.

RECOMMENDATIONS OF THE PRESIDENT'S COMMISSION

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a. Comprehensive ongoing training must be given on a regular basis to maintain operators' level of knowledge.

I.A.2.5, I.A.2.6,  
I.A.3.1      a

b. Such training must be continuously integrated with operating experience.

I.C.5,  
I.A.2.6      a

c. Emphasis must be placed on diagnosing and controlling complex transients and on the fundamental understanding of reactor safety. (SIG-C.1.c)

I.A.2.1, I.A.2.6,  
I.C.1, I.G.1,  
II.B.4      a

d. Each utility should have ready access to a control room simulator. Operators and supervisors should be required to train regularly on the simulator. The holding of operator licenses should be contingent on performance on the simulator. (SIG-C.1.c)

I.A.2.6, I.A.3.1      a  
I.A.4.1,  
I.A.4.2

17  
4. Research and development should be carried out on improving simulation and simulation systems: (a) to establish and sustain a higher level of realism in the training of operators, including dealing with transients; and (b) to improve the diagnostics and general knowledge of nuclear power plant systems.

I.A.4.1,      a  
I.A.4.2,  
I.D.5

D. TECHNICAL ASSESSMENT

1. Equipment should be reviewed from the point of view of providing information to operators to help them prevent accidents and to cope with accidents when they occur. Included might be instruments that can provide proper warning and diagnostic information; for example, the measurement of the full range of temperatures within the reactor vessel under normal and abnormal conditions, and indication of the actual position of valves. Computer technology should be used for the clear display for operators and shift supervisors of key measurements relevant to accident conditions, together with diagnostic warnings of conditions. (SIG-F.1.c)

I.D.1, I.D.2,      a  
I.D.3, I.D.5,  
II.F.1, II.F.2,  
II.F.3, II.F.4

RECOMMENDATIONS OF THE PRESIDENT'S COMMISSION

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In the interim, consideration should be given to requiring, at TMI and similar plants, the grouping of these key measurements, including distinct warning signals on a single panel available to a specified operator and the providing of a duplicate panel of these key measurements and warnings in the shift supervisor's office. (SIG-F.1.b)

I.D.2,                      a  
III.A.1.2

2. Equipment design and maintenance inadequacies noted at TMI should be reviewed from the point of view of mitigating the consequences of accidents. Inadequacies noted in the following should be corrected: iodine filters, the hydrogen recombiner, the vent gas system, containment isolation, reading of water levels in the containment isolation, reading of water levels in the containment area, radiation monitoring in the containment building, and the capability to take and quickly analyze samples of containment atmosphere and water in various places. (see recommendation A.7.)

II.B.3, II.E.4,                      a  
III.D.1 (all sections)  
III.D.2, II.F.1,  
II.F.2, II.F.3

3. Monitoring instruments and recording equipment should be provided to record continuously all critical plant measurements and conditions. (SIG-F.1.b)

III.A.1.2                      a  
I.D.3

4. The Commission recommends that continuing in-depth studies should be initiated on the probabilities and consequences (on-site and off-site) of nuclear power plant accidents, including the consequences of meltdown. (SIG-H.10.b)

I.C.1, I.C.9,                      a  
II.B.5, II.C,  
II.E.4, II.E.2

a. These studies should include a variety of small-break loss-of-coolant accidents and multiple-failure accidents, with particular attention to human failures.

I.C.1, I.C.9,                      a  
I.E.8, II.E.2,  
II.E.3,  
II.K (all sections)

b. Results of these studies should be used to help plan for recovery and cleanup following a major accident.

II.B.5                      a

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c. From these studies may emerge desirable modifications in the design of plants that will help prevent accidents and mitigate their consequences. (SIG-H.10.d). For example:

(i) Consideration should be given to equipment that would facilitate the controlled safe venting of hydrogen gas from the reactor cooling system.

II.B.1

a

(ii) Consideration should be given to overall gas-tight enclosure of the let-down/make-up system with the option of returning gases to the containment building.

III.D.1,  
III.D.2

a

d. Such studies should be conducted by the industry and other qualified organizations and may be sponsored by the restructured NRC and other federal agencies.

II.B:5

a

5. A study should be made of the chemical behavior and the extensive retention of radioactive iodine in water, which resulted in the very low release of radioiodine to the atmosphere in the TMI-2 accident. This information should be taken into account in the studies of the consequences of other small-break accidents.

III.D.2.2,  
III.D.2.3

a

6. Since there are still health hazards associated with the cleanup and disposal process, which is being carried out for the first time in a commercial nuclear power plant, the Commission recommends close monitoring of the large amount of radioactive materials. As much data as possible should be preserved and recorded about the conditions within the containment building so that these may be used for future safety analyses.

II.H (all sections)

a

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7. The Commission recommends that as part of the formal safety assurance program, every accident or every new abnormal event be carefully screened, and where appropriate be rigorously investigated, to assess its implications for the existing system design, computer models of the system, equipment design and quality, operations, operator training, operator training simulators, plant procedures, safety systems, emergency measures, management, and regulatory requirements. (SIG-B.1.a)

I.E (all sections)                      a  
I.A.1.1, I.B.1.1,  
I.B.1.2,  
I.B.2 (all sections),  
I.C.5

E. WORKER AND PUBLIC HEALTH AND SAFETY

1. The Commission recommends the establishment of expanded and better coordinated health-related radiation effects research. This research should include, but not be limited to the following:

- a. Biological effects of low levels of ionizing radiation;
- b. Acceptable levels of exposure to ionizing radiation for the general population and for workers;
- c. Development of methods of monitoring and surveillance, including epidemiologic surveillance to monitor and determine the consequences of exposure to radiation of various population groups, including workers;
- d. Development of approaches to mitigate adverse health effects of exposure to ionizing radiation; and
- e. Genetic or environmental factors that predispose individuals to increased susceptibility to adverse effects.

None    c (beyond NRC purview)  
None    c (beyond NRC purview)  
III.D.3.5    a  
None    c (beyond NRC purview)  
None    c (beyond NRC purview)

This effort should be coordinated under the National Institutes of Health -- with an interagency committee of relevant federal agencies to establish the agenda for research efforts -- including the commitment of a portion of the research budget to meet the specific needs of the restructured NRC.

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2. To ensure the best available review of radiation-related health issues, including reactor siting issues, policy statements or regulations in that area of the restructured NRC should be subject to mandatory review and comment by the Secretary of the Department of Health and Human Services. A time limit for the review should be established to assure such review is performed in an expeditious manner.

IV.H

a

3. The Commission recommends, as a state and local responsibility, an increased program for educating health professionals and emergency response personnel in the vicinity of nuclear power plants.

III.B.2,  
III.A.2.2

b

4. Utilities must make sufficient advance preparation for the mitigation of emergencies; (SIG-I.1)

a. Radiation monitors should be available for monitoring of routine operations as well as accident levels.

II.F.1, II.F.3,  
III.D.2.1, III.D.3.3

a

b. The emergency control center for health-physic operations and the analytical laboratory to be used in emergencies should be located in a well-shielded area supplied with uncontaminated air.

III.A.1.2,  
III.D.3.2,  
III.D.3.3

b

c. There must be a sufficient health-related supply of instruments, respirators, and other necessary equipment for both routine and emergency conditions.

III.D.3.2

a

d. There should be an adequate maintenance program for all such health-related equipment.

III.D.3.3

b

5. An adequate supply for the radiation protective (thyroid blocking) agent, potassium iodide for human use, should be available regionally for distribution to the general population and workers affected by a radiological emergency.

III.A.1.3

a

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F. EMERGENCY PLANNING AND RESPONSE

1. Emergency plans must detail clearly and consistently the actions public officials and utilities should take in the event of off-site radiation doses resulting from release of radioactivity. Therefore, the Commission recommends that:

a. Before a utility is granted an operating license for a new nuclear power plant, the state within which that plant is to be sited must have an emergency response plan reviewed and approved by the Federal Emergency Management Agency (FEMA). The agency should assess the criteria and procedures now used for evaluating state and local government plans and for determining their ability to activate the plans. FEMA must assure adequate provision, where necessary, for multi-state planning. (SIG-G.2.f)

III.A.2  
(all sections),  
III.B (all sections) a

b. The responsibility at the federal level for radiological emergency planning, including planning for coping with radiological releases, should rest with FEMA. In this process, FEMA should consult with other agencies, including the restructured NRC and the appropriate health and environmental agencies. (see recommendation A.4) (SIG-G.2.b)

III.B (both sections) a  
III.A.1  
III.A.2.2

c. The state must effectively coordinate its planning with the utility and with local officials in the area where the plant is to be located. (SIG-G.2.d)

III.A.1.1, a  
III.A.2.2,  
III.B (both sections)

d. States with plants already operating must upgrade their plans to the requirements to be set by FEMA. Strict deadlines must be established to accomplish this goal. (SIG-G.2.f)

III.A.1.1, a  
III.A.2.2,  
III.B (both sections)

2. Plans for protecting the public in the event of off-site radiation releases should be based on technical assessment of various classes of accidents that can take place at a given plant.

III.A.1.1, a  
III.A.2.2

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a. No single plan based on a fixed set of distances and a fixed set of responses can be adequate. Planning should involve the identification of several different kinds of accidents with different possible radiation consequences. For each such scenario, there should be clearly identified criteria for the appropriate responses at various distances, including instructing individuals to stay indoors for a period of time, providing special medication, or ordering an evacuation. (SIG-G.2.i)

III.A.1.1,  
III.A.2.2

a

b. Similarly, response plans should be keyed to various possible scenarios and activated when the nature and potential hazard of a given accident has been identified.

III.A.1.1,  
III.A.2.2

a

c. Plans should exist for protecting the public at levels lower than those currently used in NRC-prescribed plans:

III.A.1.1,  
III.A.2.2

a

d. All local communities should have funds and technical support adequate for preparing the kinds of plans described above. (SIG-G.2.e)

III.B

a

3. Research should be expanded on medical means of protecting the public against various levels and types of radiation. This research should include exploration of appropriate medications that can protect against or counteract radiation.

None

c (beyond NRC purview)

4. If emergency planning and response to a radiation-related emergency is to be effective, the public must be better informed about nuclear power. The Commission recommends a program to educate the public on how nuclear power plants operate, or radiation and its health effects, and on protective actions against radiation. Those who would be affected by such emergency planning must have clear information on actions they would be required to take in an emergency. (SIG-A.3.a)

III.C (all sections)

a

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5. Commission studies suggest that decision-makers may have over-estimated the human costs, in injury and loss of life, in many mass evacuation situations. The Commission recommends study into the human costs of radiation-related mass evacuation and the extent, if any, to which the risks in radiation-related evacuations differ from other types of evacuations. Such studies should take into account the effects of improving emergency planning, public awareness of such planning, and costs involved in mass evacuations.

III.A.3,D.3,                      b  
III.B.(both sections)

6. Plans for providing federal technical support, such as radiological monitoring, should clearly specify the responsibilities of the various support agencies and the procedures by which those agencies provide assistance. Existing plans for the provision of federal assistance, particularly the Interagency Radiological Assistance Plan and the various memoranda of understanding among the agencies, should be reexamined and revised by the appropriate federal authorities in light of the experience of the TMI accident, to provide for better coordination and more efficient federal support capability. (SIG-G.4.a)

III.A.3.6(2)                      a

G. THE PUBLIC'S RIGHT TO INFORMATION

1. Federal and state agencies, as well as the utility, should make adequate preparation for a systematic public information program so that in time of a radiation-related emergency, they can provide timely and accurate information to the news media and the public in a form that is understandable. There should be sufficient division of briefing responsibilities as well as availability of informed sources to reduce confused and inaccurate information. (SIG-J.1). The Commission therefore recommends:

III.A.1.1,                      a  
III.B,  
III.C (all sections)

a. Since the utility must be responsible for the management of the accident, it should also be primarily responsible for providing information on the status of the plant to the news media and to the public; but the restructured NRC should also play a supporting role and be available to provide background information and technical briefings. (SIG-J.2.a)

III.A.1.1                      a

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b. Since the state government is responsible for decisions concerning protective actions, including evacuation, a designated state agency should be charged with issuing all information on this subject. This agency is also charged with the development of and dissemination of accurate and timely information of off-site radiation doses resulting from releases of radioactivity. This information should be derived from appropriate sources. (see recommendation F.1.) This agency should also set up the machinery to keep local officials fully informed of developments and to coordinate briefings to discuss any federal involvement in evacuation matters. (SIG-J.2.b)

None

c (beyond NRC purview)

2. The provision of accurate and timely information places special responsibilities on the official sources of this information. The effort must meet the needs of the news media for information but without compromising the ability of operational personnel to manage the accident. (SIG-J.2) The Commission therefore recommends that:

a. Those who brief the news media must have direct access to informed sources of information.

III.C (all sections) a

b. Technical liaison people should be designated to inform the briefers and to serve as a resource for the news media.

III.C (all sections) a

c. The primary official news sources should have plans for the prompt establishment of press centers reasonably close to the site. These must be properly equipped, have appropriate visual aids and reference materials, and be staffed with individuals who are knowledgeable in dealing with the news media. These press centers must be operational promptly upon the declaration of a general emergency or its equivalent.

III.A.1.2, b  
III.B.2

3. The coverage of nuclear emergencies places special responsibilities on the news media to provide accurate and timely information. The Commission therefore recommends that:

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a. All major media outlets (wire services, broadcast networks, news magazines, and metropolitan daily newspapers) hire and train specialists who have more than a passing familiarity with reactors and the language of radiation. All other news media, regardless of their size, located near nuclear power plants should attempt to acquire similar knowledge or make plans to secure it during an emergency.

None

c (beyond NRC purview)

b. Reporters discipline themselves to place complex information in a context that is understandable to the public and that allows members of the public to make decisions regarding their health and safety.

None

c (beyond NRC purview)

c. Reporters educate themselves to understand the pitfalls of interpreting answers to "what if" questions. Those covering an accident should have the ability to understand uncertainties expressed by sources of information and probabilities assigned to various possible dangers.

None

c (beyond NRC purview)

4. State emergency plans should include provision for creation of local broadcast media networks for emergencies that will supply timely and accurate information. Arrangements should be made to make available knowledgeable briefers to go on the air to clear up rumors and explain conditions at the plant. Communications between state officials, the utility, and the network should be prearranged to handle the possibility of an evacuation announcement.

III.B.2,  
III.A.2.2

b

5. The Commission recommends that the public in the vicinity of a nuclear power plant be routinely informed of local radiation measurements that depart appreciably from normal background radiation, whether from normal or abnormal operation of the nuclear power plant, from a radioactivity cleanup operation such as that at TMI-2, or from other sources.

II.H.1,  
III.A.2.2  
III.C

b

COMPARISON OF THE PRESIDENT'S RESPONSE TO THE RECOMMENDATIONS  
OF THE PRESIDENT'S COMMISSION (DATED DECEMBER 7, 1979)  
WITH THE NRC ACTION PLAN (NUREG-0660)

Key:

Impact on TMI Action Plan

- a. Recommendation is adequately covered in the Action Plan.
- b. This recommendation (or some part thereof) may not be explicitly included in the Action Plan but it is intended that, when the action is undertaken by the lead office, this specific recommendation will be taken into consideration.
- c. The NRC staff or Commission does not agree with the recommendation or the recommendation is beyond the purview of the NRC. The Action Plan does not account for this recommendation.

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A. THE NUCLEAR REGULATORY COMMISSION

Agency Organization and Management

Kemeny Commission Recommendation: The current NRC should be abolished and restructured as an executive agency under the leadership of a single administrator. This single administrator would have substantial discretionary authority over agency organization and management and would assure coordination of the research, operating experience, and inspection and enforcement activities. The Administrator and major staff components would be consolidated in the same building or group of buildings. The Commission recommended that the administrator be a person from outside the present agency. (A.1)

1. The President's Proposal: The President agrees that improvements in NRC's organization and management are essential. Because of the value of diversity of views that a commission can bring to decisionmaking, and the protection from political intervention that independence can provide, the President will retain the NRC as an independent commission. The President has directed, however, that several concrete actions be taken to address the deficiencies that have been identified:

a. The Office of Management and Budget will prepare a reorganization plan to remedy the ambiguity and confusion as to the respective roles of the Chairman, the Commissioners, and the Executive Director for Operations. The plan will strengthen the Chairman's ability as Chief Executive Officer to provide forceful management control over the operating functions of the NRC and to lead the Commission in the development of a unified nuclear safety program. It will give the Chairman greater power to make key personnel decisions, as well as authority to act on behalf of the Commission during an emergency. This plan will be submitted to Congress early in the next session.

None

C,  
beyond NRC  
purview

b. The President will appoint a new Chairman of the NRC from outside the agency. In the meantime, Commissioner John Ahearne, now a member of the NRC, will serve as Chairman. Dr. Ahearne will stress both safety and the prompt implementation of needed reforms.

None

C,  
appointment  
completed

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c. The General Services Administration is directed to prepare a plan for consolidating the Commissioners and their staff with the major staff components of the agency in the same building or a group of buildings in close proximity with each other.

V-15                      a  
V-16

Kemeny Commission Recommendation: A permanent oversight committee on nuclear safety should be established to report to the President and the Congress at least annually. This committee would have a maximum of 15 members from divergent backgrounds and would be assisted by its own staff (A.2).

2. The President's Proposal: Retention of the commission form for the NRC alleviates much of the need for a permanent oversight group. However, there is significant merit to the establishment of a small advisory committee of experts to report to the President and the public on the progress of the NRC, other Federal agencies, the States, and the utilities in improving the safety of nuclear power and in implementing the Kemeny Commission recommendations. An oversight Committee will be established shortly.

None                      c,  
beyond NRC  
purview

Kemeny Commission Recommendation: The Commission recommends the strengthening of the role of the Advisory Committee on Reactor Safeguards (ACRS) as an independent technical check on safety matters. Recommended changes include expanding the staff, removing the requirement that it review every license application, and providing the ACRS with the statutory right to intervene in licensing and rulemaking hearings and to initiate rulemaking proceedings (A.3).

3. The President's Proposal: The ACRS plays a valuable role and should be strengthened. The President is:

a. Asking the NRC to direct the ACRS to focus its attention on a priority basis on the major outstanding safety issues. NRC should augment the analytical capability of the ACRS.

V-3                      a

b. Pledging to work with the Congress to review the wisdom of the current statutory requirement that the ACRS review every license application.

V-3                      a

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c. Requesting that the Chairman of the NRC, in cooperation with the ACRS, assess these recommendations and advise the Oversight Committee of steps that might be taken to expand the ACRS capability to provide an independent safety check.

The Agency's Substantive Mandate

Kemeny Commission Recommendation: The Kemeny Commission recommends that increased priority be directed to assuring the safety of nuclear reactors. Specific areas addressed include: establishing safety-cost trade-offs, reviewing the transfer of statutory responsibilities not related to safety, upgrading licensing functions, and increasing the safety emphasis in control room design, research, and plant systems (A.4); greater licensee responsibility and accountability through higher organizational and management standards (A.5); remote siting of new plants (A.6); and plans for the mitigation of accident consequences (A.7).

4. The President's Proposal: Although transfer of the statutory responsibilities of the NRC will not now be pursued, the President urges implementation of the remaining recommendations. In many areas covered by the recommendations, the NRC has already begun to remedy the deficiencies noted by the Kemeny Commission. The Oversight Committee is directed to monitor and report periodically on NRC progress in implementing these recommendations.

Kemeny Commission Recommendation: The Kemeny Commission recommended that before issuing a new construction permit or operating license, the NRC should assess the need for new safety improvements, review the competency of the prospective operating licensees to manage the plant and examine the adequacy of the training program, and condition new licenses on review and approval of State emergency plans. (A.8)

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V-3

a

Various, see  
comparison of  
President's  
Commission  
Recommendations  
A.4, A.5,  
A.6 & A.7

a

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5. The President's Proposal: This recommendation provides the Kemeny Commission's guidance on licensing during the transition to an improved nuclear regulating regime. Clearly the NRC has the authority to proceed with the licensing of plants in this transition period on a case-by-case basis, as the Kemeny Commission recommended, and that this authority may be used as circumstances surrounding a plant dictate. The NRC has indicated that it will pause on issuing new licenses and construction permits in order to devote its full attention to putting its house in order. The President endorses the approach the NRC has adopted, but he calls on the NRC to complete its work as quickly as possible, and in any event, no later than six months from today.

Action items  
listed in  
App. A                      a

Agency Procedures

Kemeny Commission Recommendation: The Commission indicated that improvements are needed in the resolution and subsequent enforcement of generic and specific safety issues. It recommends improved rulemaking procedures (A.9); improved licensing procedures to emphasize early and effective resolution of safety issues (A.10); and increased emphasis on inspection and enforcement functions and systematic evaluation of operating plants (A.11).

31

6. The President's Proposal: Improvements in procedures are essential for improved regulation of commercial nuclear power. He endorses the Kemeny recommendations to improve rulemaking procedures and to strengthen inspection and enforcement. Moreover, he endorses the intent of the licensing recommendation: licensing reform should focus on improving public confidence in the integrity of the process, as well as assuring the safety of nuclear facilities. But because some of the licensing recommendations (A.10) contain specific provisions which require careful evaluation by the NRC, the appropriate Congressional committees, and concerned public interest groups before final judgment is made on their desirability, the President has decided to withhold his endorsement of the licensing recommendations at this time.

In order to meet the need for procedural reform, the President requests the NRC to undertake the following actions:

- a. Proceed with the implementation of the reforms of rulemaking.

IV.G                      a

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b. Perform an open and systematic evaluation of its licensing procedures. They should actively seek and address input from affected outside groups as well as disinterested parties, such as the Administrative Conference.

c. Enhance significantly its emphasis on inspection and enforcement. He acknowledges that the NRC's long delay in implementing a systematic assessment of operating reactor experience is being addressed by the establishment of the Office of Analysis and Evaluation of Operational Data.

d. In order to permit greater involvement of the commissioners in the development of policy on key safety matters, the Chairman of the NRC is requested to review the ex parte rules governing contact between commissioners and staff.

e. Accelerate its program to place a resident Federal inspector at every reactor site. Further, the NRC is requested to evaluate the desirability of a stronger Federal presence in the control room of every operating reactor, such as by added government representatives or on-line monitoring by a government computer facility.

B. THE UTILITY AND ITS SUPPLIERS

Kemeny Commission Recommendations: The Kemeny Commission recognized that its recommendations with respect to the nuclear industry were based on evaluation of a limited sample. But to the extent that its findings are representative of the industry as a whole, the Commission urged a dramatic change in the attitudes toward safety and regulation. The Commission recommends that the industry: specify safety standards and monitor compliance (B.1); establish within each nuclear utility a separate safety group (B.2); improve integration and accountability at all management levels (B.3); attract and retain highly qualified candidates for operators and supervisors (B.4); and improve the writing, reviewing, and monitoring of plant procedures (B.5). In addition, utility rate-setting agencies are urged to allow the prompt recovery of safety expenditures (B.6).

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V.9    a

I.B.2 (all sections)  
II.E  
II.J.1  
II.J.2  
IV.A

V.17    a

I.B.2.2    a  
III.A.3.4

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1. The President's Proposal: The President endorses these recommendations. Safety of nuclear reactors can be significantly improved through a pervasive and knowledgeable involvement by utility top management in seeking safe and reliable plant operation. Indeed, the primary reform must come from within the utility industry and its suppliers. Industry initiatives since the accident to improve safety, such as the establishment of the Institute of Nuclear Power Operations (INPO) and the Nuclear Safety Analysis Center (NSAC), should be pursued and augmented. An industry-sponsored central technical organization should address the deficiencies revealed by the accident at Three Mile Island. In addition, the NRC is establishing upgraded requirements for management competence, operating procedures, independent review, and system safety evaluation. These steps represent important initiatives, but they are only a start. The President, therefore, calls for the following actions:

33  
a. The management of nuclear utilities must follow through on the safety improvement programs that have been announced, add to and strengthen these programs, and demonstrate a commitment to safety that goes beyond mere compliance with regulation.

I.B.1  
(all sections)

a

b. A concept of personal responsibility must be applied: a competent and well-trained decision maker must always be in charge at the corporate level and at the plant site. Primary responsibility for safety must rest with the utility companies that operate and maintain nuclear power plants.

I.B.1  
(all sections)

a

c. INPO and NSAC are asked periodically to inform the Chairman of the NRC and the Oversight Committee of their objectives, milestones for implementation, progress in meeting these milestones, and the results of their independent evaluation of utility performance.

I.A.3.5

b

d. NSAC should direct early attention to evaluating the readiness and assisting in the safety upgrading of those utilities with nuclear generating stations under construction which would have a major impact on the displacement of foreign oil. NRC is encouraged to do likewise, making use of the NSAC efforts as appropriate.

All actions  
in App. A,  
II.J.3

a

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e. The Oversight Committee is directed to monitor industry progress, identify opportunities for accelerating and strengthening the improvements which have been initiated, and identify potential opportunities for Federal assistance in these efforts.

None

c,  
beyond NRC  
purview

f. The Secretary of Energy is directed to provide appropriate assistance to the industry and the Oversight Committee. NRC is requested to evaluate and accredit industry efforts to assure that prompt and effective attention is being given to needed safety reforms.

I.A.3.5

b

C. TRAINING OF OPERATING PERSONNEL

Kemeny Commission Recommendations: These are directed at upgrading the training of operators and assuring that training is an ongoing activity. Specifically they urge: the establishment of accredited training institutions (C.1); training by individual utilities in the specifics of particular plants, recertification by NRC, and upgraded licensing requirements (C.2); continuous training integrated with operating experience, emphasis on understanding abnormal operational conditions, emphasis on the fundamentals of reactor safety, and regular training with simulators (C.3); and research and development to improve simulation systems (C.4).

1. The President's Proposal: The President is particularly concerned with the Commission's findings that neither the industry nor the NRC gave adequate attention to the competence of operator and supervisory personnel. Instead, the safety of commercial nuclear power was equated with engineered equipment to the neglect of the human element.

Of special concern is the lack of attention and devotion of resources to the training of operators which the Kemeny investigation revealed. It is clear that site managers must consider themselves responsible for operator training. The training organization in each utility must be staffed by motivated, educationally qualified instructors. There must be training for engineers and managers at a level higher than control room operators. Throughout all this training, the basic principles of science and engineering which govern nuclear plant safety and reliability must be emphasized. Finally, a rigorous requalification program is absolutely necessary to assure that plant operations are improved and skills once developed are not lost.

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The President strongly supports the Commission recommendations for improved training of operator and supervisory personnel. In response to the TMI accident, the NRC is revising its requirements with respect to operator training and qualifications. INPO will also be directing its early attention to this area. Because of the importance of meaningful and timely improvement in knowledge and capabilities of personnel involved in nuclear plant management, operation, and maintenance, the President is:

a. Requesting that NRC inform the Oversight Committee within four months on its progress in implementing the Commission recommendations for a) more rigorous criteria for operator and supervisor qualifications, b) expanded and improved use of simulators in training, c) NRC examination and recertification of licensed operators, and d) criteria for accreditation of training institutions.

I.A.2.1                      b  
I.A.2.6  
I.A.2.7  
I.A.3.1  
I.A.3.3  
I.A.4.1  
I.A.4.2

b. Asking INPO, with assistance as needed from DOE, to make an assessment of the total manpower and training requirements of nuclear utilities and to develop a program for upgrading and accrediting training institutions.

I.A.3.5                      b

c. Urging utilities to work together to review and improve their internal training programs in accordance with the criteria discussed above.

None                      c,  
beyond NRC  
purview

d. Directing Federal agencies which have significant experience in the training of technical personnel analogous to nuclear utility operations, such as DOD, NSSA, FAA, and DOE, to cooperate with NRC and INPO in identifying areas where assistance might be provided.

I.D.6                      b

e. Directing the Oversight Committee to review utility training programs, drawing on DOE assistance as appropriate, to evaluate NRC's progress on upgrading regulatory requirements, and to report to the President within six months.

None                      c,  
beyond NRC  
purview

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Status

D. TECHNICAL ASSESSMENT

Kemeny Commission Recommendations: These recommendations address: the need for improvements in control room technology (D.1); review of design and maintenance inadequacies to mitigate the consequences of potential accidents (D.2); continuous recording of critical plant measurements (D.3); expanded safety-related technical studies (D.4 and 5); close monitoring of the TMI cleanup process and the preservation of data for future safety analyses (D.6); and a rigorous screening and investigation of every abnormal event to assess the implications for design, operation, training, management, and regulation (D.7).

1. The President's Proposal: The President supports these recommendations and notes that NRC and its licensees are beginning to apply many of the technical lessons learned from TMI. As the industry and the NRC carry out their programs of technology improvement, the President has urged that special emphasis be placed in the following areas:

a. Plant designs, equipment, control rooms, training, etc., should be standardized insofar as practicable. For example, it makes no sense that the control room for Unit 1 at Three Mile Island is designed much differently than the control room at Unit 2, even though both reactor plants were designed by the same manufacturer. This apparently resulted from the utility using different architect-engineers for the two units.

I.A.2.7  
I.D.4  
V.9

a

b. Control rooms should be simplified in display and control. The data gathered by the Commission show that at TMI-2 during normal operation there were at least 50 alarms activated in the control room, and after the reactor trip there were over 100. Operators cannot be expected to take effective action under such circumstances.

I.D.2  
(all sections)

a

In order to provide a balanced and effective technical response, the President is taking the following actions:

c. NRC is asked to provide its plan for the implementation of safety improvements, and utilities are requested to respond in a timely fashion. To assist the NRC in this effort, the President has requested a supplemental appropriation of \$32.6 million in FY 1980.

The overall  
schedule and  
implementa-  
tion in the  
Action Plan

a

Summary of the President's Response to the  
Recommendations of the President's Commission

Related TMI  
Action Plan Task                      Status

d. DOE is directed to coordinate with NRC the prompt and effective diffusion and use by the utilities of the data on operating experience gathered by NRC, DOE, and the industry itself.

I.E.4                                      a

e. NRC is asked to expand the scope of LWR safety research activities to focus on developments which will reduce the likelihood of future accidents.

I.A.4.1                                  a  
I.A.4.2  
I.A.4.3  
I.A.4.4  
I.D.5  
I.E.3  
I.E.8  
II.B.5  
II.E.2.2  
II.E.3.3

f. NASA, FAA, and DOE are directed to assist NRC and the nuclear industry by identifying appropriate technologies that could improve the operational safety and reliability of nuclear power plants. Such technology would include: control and instrumentation system design, information display techniques, and advanced training methods.

I.D.6                                      b

g. The President endorses the joint NRC/EPRI/DOE effort to obtain data during the TMI cleanup. In addition, NRC is asked to assure that the cleanup is conducted in a manner consistent with adequate protection for the environment and public health and safety. The Administration has requested a \$7 million supplemental appropriation for 1980 to accomplish this.

II.H                                        a

h. The Oversight Committee is directed to evaluate NRC and utility progress in implementing safety improvements and assess the Federal government's program in LWR safety research to assure that it is appropriately focused and funded.

None                                        c,  
beyond NRC  
purview

E. WORKER AND PUBLIC HEALTH SAFETY

Kemeny Commission Recommendations: The Kemeny Commission urged the following: expanded and better coordinated health-related radiation effects research with an interagency committee to establish an agenda for research efforts (E.1); mandatory review by HEW of NRC radiation-related health actions (E.2); expanded State and local programs for educating health professionals and emergency response personnel (E.3); and advance preparation for emergencies (E.4 and 5).

Summary of the President's Response to the  
Recommendations of the President's Commission

Related TMI  
Action Plan Task

Status

1. The President's Proposal: The potential hazards to workers and the general public from accidents at nuclear power plants are closely related to the health hazards from exposures to radiation from other sources. Early last year, concern was raised about potential latent effects from exposure to radioactive fall-out in Nevada and Utah, about risks for workers in energy and defense activities, and about the radiation hazards of X-ray diagnoses and therapy. The need for coordinated policy, better research, opportunities for public input, and better public information became clear. On October 23, the President announced several Administration initiatives to meet these needs: first, the establishment of a Radiation Policy Council, chaired by the Administrator of the EPA, with participation of policy-making officials of all the relevant regulatory, research, and operating agencies; and second, the establishment of an Interagency Radiation Research Committee, chaired by the Director of the National Institutes of Health. The Council and the Research Committee provide expert and open processes for meeting research needs and enhancing guidance for worker and public protection from potential radioactive exposures.

The President is taking the following additional actions:

a. NRC is requested to submit for review all actions affecting worker and public health and safety to the Radiation Policy Council.

IV.H

a

b. Utilities should respond expeditiously to NRC's upgraded requirements for advance preparation for the mitigation of emergencies.

III

a

c. The Federal Emergency Management Agency (FEMA) is directed to address the need for improved advance preparation for emergencies and public education programs in the context of State emergency response plans.

III.B

a

d. DOE is directed to strengthen its program to develop technologies for reducing the radiation exposure of workers at nuclear power plants.

III.D.3

a

Summary of the President's Response to the  
Recommendations of the President's Commission

Related TMI  
Action Plan Task

Status

F. - EMERGENCY PLANNING AND RESPONSE

Kemeny Commission Recommendations: The Commission found that at all levels of government, planning for the offsite consequences of radiological emergencies lacked coordination and urgency. Their recommendations call for significant change: an improved state response plan is a requisite for granting an operating license (F.1); FEMA should have the lead responsibility, in consultation with NRC and other appropriate agencies, for radiological emergency planning (F.1); emergency response plans should be based on various classes of accidents and local communities should have funds and technical assistance for local planning (F.2); research on medical means of mitigating radiation effects should be expanded (F.3); a program is needed to educate the public on nuclear plant operation, health effects from radiation and protective actions against radiation (F.4); further study on mass evacuation is necessary (F.5); and plans for providing Federal emergency support should be revised to assure improved coordination and more effective capabilities (F.6).

1. The President's Proposal: The President supports these recommendations. The Federal government's ability to deal with emergencies has already been improved by consolidating the widely scattered and uncoordinated programs for emergency preparedness and response under FEMA. Recognizing that the NRC has statutory responsibility for onsite emergency preparedness and response, the President is taking the following action:

a. FEMA is directed to: (1) take the lead in offsite emergency planning and response; (2) complete by June 1980 the review of State emergency plans in those States with operating reactors; (3) complete as soon as possible the review of State emergency plans in those States with plants scheduled for operation in the near future; (4) develop and issue an updated series of interagency assignments which would delineate respective agency capabilities and responsibilities and clearly define procedures for coordination and direction for both emergency planning and response; (5) assure that DOE resources and capabilities for responding to radiological emergencies are made available and augmented as needed to service civilian related radiological emergencies; and (6) assure the development of programs to address the recommendations for additional research and public education needs.

None

c,  
beyond NRC  
purview

b. NRC is asked to assist FEMA in these activities.

III.B

a

Summary of the President's Response to the  
Recommendations of the President's Commission

<u>Related TMI Action Plan Task</u>	<u>Status</u>
None	c, beyond NRC purview

c. The Director of FEMA will report periodically to the Oversight Committee and the President on progress that has been made.

d. State and local officials are encouraged to work with FEMA to assure the necessary coordination of their respective emergency responsibilities.

e. FEMA is directed to provide the States with technical assistance wherever appropriate.

f. A supplemental appropriation for fiscal year 1980 in the amount of \$13.3 million is being submitted to Congress to improve emergency preparedness. Of this, \$8.9 million will be used by FEMA and \$4.4 million by NRC. The President requests prompt Congressional consideration.

- 40 -

G. THE PUBLIC'S RIGHT TO INFORMATION

Kemeny Commission Recommendations: The Commission found that there were a number of deficiencies in providing information to the public during the accident. The Commission recommended the following actions: Federal and State agencies and utilities should prepare a public information program clearly defining their respective responsibilities (G.1); the logistics and resources for information distribution should be improved (G.2); major media outlets and local news media should improve their capabilities to understand and process information for public consumption (G.3); plans for establishing emergency broadcast networks should be developed (G.4); and the public should be routinely informed of abnormal radiation measurements (G.5).

1. The President's Proposal: The President fully supports these recommendations. Actions have already been taken by State and local agencies and utilities to implement many of them. In addition, the President is taking the following actions:

a. NRC should continue to make prompt announcements of abnormal radiation measurements.

III.C.1                      b

Summary of the President's Response to the  
Recommendations of the President's Commission

<u>Related TMI Action Plan Task</u>	<u>Status</u>
None	c, beyond NRC purview
None	c, beyond NRC purview
None	c beyond NRC purview
V.13	a

b. The Radiation Policy Council is directed to work with media representatives to develop a program for improving media coverage of radiological emergencies.

c. Within the context of offsite emergency response planning, FEMA is directed to develop procedures for dissemination of information during an emergency.

d. FEMA is directed to review progress in this area and advise the Oversight Committee on the need for further Federal assistance.

e. The President's reorganization proposal will empower the Chairman to act on behalf of the Commission and be its spokesman during an emergency.

COMPARISON OF RECOMMENDATIONS IN VOLUME I OF SIG REPORT  
(NUREG/CR-1250) WITH THE  
TMI ACTION PLAN (NUREG-0660)

The recommendations of the NRC Special Inquiry Group (SIG) were considered in the evolution of the Action Plan from Draft 2 to the final version. A number of the SIG recommendations were considered to be accommodated implicitly in action items already in the plan (status group "b"); another group of SIG recommendations (status group "a") were accommodated either by modification of action items or by the addition of new action items. The new action items are:

- I.G.2 Scope of Test Program (low-power testing)
- II.E.5 Design Sensitivity of B&W Reactors
- II.E.6 In Situ Testing of Valves
- II.F.4 Studies of Control and Protective Action Design Requirements
- III.C.2 The Office of Public Affairs (OPA) will develop agency policy and training for interfacing with the news media and other interested parties
- IV.E.2 Plan for Early Resolution of Safety Issues
- IV.F Financial Disincentives to Safety

Status of recommendation in the Action Plan:

- a. Recommendation is adequately covered in the Action Plan.
- b. This recommendation (or some part thereof) may not be explicitly included in the Action Plan but it is intended that when the action is undertaken by the lead office, this specific recommendation by the SIG will be taken into consideration.
- c. Staff or Commission do not agree with recommendation or the recommendation is beyond the purview of the NRC. The Action Plan was not changed to account for this recommendation.

Note: The enclosed list includes references to pages of the report of the Special Inquiry Group where the original recommendation can be found, and cross-references to similar recommendations made by (a) the Special Inquiry Group (SIG) itself, and (b) the President's Commission on the TMI accident. For example, a parenthetical note such as (p. 93) refers to page 93 of Volume I of NUREG/CR-1250, the SIG report; and a note such as (Vol. I, p. 116; Vol. II, Pt. 1, p. 0041, #2; Vol. II, Pt. 2, p. 0387, #7) refers to page 116 of Volume I of NUREG/CR-1250, and similar recommendations in the draft Volume II of NUREG/CR-1250, in Parts 1 and 2 (Pt. 1, Pt. 2). A note such as (PC-A.4) identifies a similar recommendation in the list of recommendations made by the President's Commission on the TMI accident.

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

A. GENERAL

A.1. How Safe is Safe Enough

- a. The Administrator should formulate an ultimate safety objective for the regulatory program in the first instance for review and approval by the President and Congress, and then when a standard is approved should apply it (Vol. I, p. 116; Vol. II, Pt. 1, p. 24, p. 105). (PC-A.4)
- b. Decisions about the ultimate safety objective in the regulated program and about the expansion or reduction of our country's reliance on nuclear power should be made by the Executive and Congress as part of our national energy strategy (Vol. I, p. 91, 116, 151; Vol. II, Pt. 1, p. 0042, #11, p. 0148, #1).

V.1

b

V.1

b

A.2. Oversight Over the NRC

- a. Firm commitment on the part of the President and the congressional oversight committees, and a commitment by the public--if what it wants is safer nuclear power plants--to keep the pressure on elected representatives for major, meaningful reform (p. 92).
- b. Congressional oversight committees should hold the NRC accountable with respect to outstanding generic items (p. 93).

None

c (beyond  
NRC purview)

None

c (beyond  
NRC purview)

A.3. Public Education

- a. Renewed effort must be made to educate the public as to the actual risks of nuclear power and that the risks and benefits associated with nuclear power plants must be weighed against the very real health and environmental risks associated with other forms of power generation (p. 91). (PC-F.4)
- b. Substantial efforts are necessary to provide information to the public about actual radioactive releases during the TMI accident and their actual hazards, as opposed to perceived hazards. The NRC should play an effective role in this task (p. 154).

III.C.1

b

III.C.1

a

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

A.4. Moratorium or Suspension of Licensing Reviews

- a. The NRC should satisfy itself that every licensee for an operating reactor has evaluated: (1) the management and technical qualifications of its site crews and site management and their familiarity with the plant; (2) the adequacy of emergency operating procedures; (3) possible significant human factors or instrumentation problems in the control room; (4) and their training program for operators (p. 146). (PC-A.8, B.3.b)
- b. The NRC would be wise to suspend processing of applications for Construction Permits and Limited Work Authorizations until it considers the various recommendations we have made for reforming the licensing process and for increased standardization (p. 92). (PC-A.8)

(1) I.B.1.1, I.B.1.2,  
(2) I.C.7, I.C.8, I.C.9,  
III.A.1.1, III.A.2.2  
(3) I.D.1, I.D.5,  
(4) I.A.2.1, I.A.2.2,  
I.A.2.3, I.A.3.1,  
I.G.1, II.B.4

a  
a  
a  
a

V.9

a

A.5. Statutory Base

Changes will require new legislation, executive reorganization, and substantial overhaul of the way the NRC is organized and managed, at the very least (p. 92).

V.2 through V.5,  
V.7 through V.13, V.17

a

B. EVALUATION OF OPERATING EXPERIENCE

B.1. Basic Responsibility

- a. Operating information must be evaluated both by industry and the NRC to identify items of potential safety concerns, and these must then be investigated in depth (Vol. 1, p. 97; Vol. II, Pt. 1, p. 135, #2). (PC-A.11.a, A.11.b, B.1.b, D.7)

I.E (all sections)  
I.B.2.3, I.B.2.4

a

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

B.2. Office of Analysis and Evaluation of Operating Data (AEOD)

- a. The Office of Analysis and Evaluation of Operational Data (AEOD) should be given the task of developing recommendations as to where actions to meet operating problems ought to be required. These recommendations should, in each instance, be required to be rejected, modified, or imposed by the appropriate program office of the NRC within a fixed period of time. Unresolved disagreements between AEOD and a program office could be required to be reviewed by the Commission or Administrator (Vol. I, p. 99; Vol. II, Pt. 1, p. 105, #8, p. 135).
- b. Present NRC staff functions devoted to performing quantitative risk assessment of reactors should be relocated in AEOD (p. 99).
- c. AEOD should be staffed in part on a rotational basis from all the other offices and branches at a level of no less than 35-40 professionals (p. 99).
- d. To aid AEOD, consideration should be given to a revised comprehensive reporting system applicable to both utilities and vendors. This system should require more in-depth reporting and followup of significant events, provide for the reporting of minor incidents in a separate format amenable to statistical analysis, and include reporting requirements that are uniform so that the data have a common basis (p. 99). (PC-A.11.b)

I.E.1

b

I.E.1, V.11

b

I.E.1, V.11

b

I.E.5, I.E.6,  
II.J.4

b

B.3. Inspection of Plants

- a. More emphasis should be given to supplementing the resident inspector with a team or blitz approach in which a group of inspectors make unannounced visits to conduct in-depth inspections of the overall operation of a plant (p. 100). (PC-A.11.d, A.11.e)
- b. More attention should be given to reactive inspections (responding to notifications, complaints, specific problems, or following up on previous difficulties) (p. 100).

I.B.2.1

b

I.B.2.1,  
II.J.2.1

a

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

- c. I&E should develop new programs to monitor and evaluate utility management and technical competence on an on-going basis (p. 100).
- d. More effort should be devoted by regional offices to evaluating each utility across the board and vis-a-vis other utilities in order to identify weak spots and problem areas. If the operation is not judged to be satisfactory, then the reactor should be required to be shut down (p. 100).
- e. The proficiency of the IE staff and management should be increased by staff rotation (field and headquarters) and by conducting regular seminars, attended by both NRC management officials and inspectors, in order to identify problems the inspectors are encountering (p. 101).

I.B.2.3, I.B.2.4

a

I.B.2.3

b

IV.D

b

B.4. Institute of Nuclear Power Operation (INPO)

- a. We urge the rapid implementation of the industry-wide Institute of Nuclear Power Operation (INPO) to evaluate operating information and problems and police and upgrade the management and operating competence of its members (p. 110). (PC-B.1.a)

I.A.3.5

b

C. ONSITE PERSONNEL AND PROCEDURES

C.1. Training

- a. There is a clear need for more operator training with emphasis on response to emergencies and on system diagnosis (Vol. I, p. 105; Vol. II, Pt. 2, p. 612, #7; Vol. II, Pt. 3, p. 854, #1). (PC-A.4.a)
- b. The NRC should assume a direct role in the training of operators including certification of training facilities, establishment of a minimum curriculum, and certification of instructors (Vol. I, p. 105; Vol. II, Pt. 2, p. 612, #6). (PC-C.1)
- c. Operators must be trained as a team on the simulator with more emphasis on response to emergencies and on system diagnosis (p. 105). (PC-C.3.c, C.3.d)

I.A.2.1, I.A.2.6  
I.A.2.2, I.C.9, I.C.1  
I.A.2.5, II.B.4

a

I.A.2.3, I.A.2.6,  
I.A.2.7, I.A.3.5

b

I.A.2.2,  
I.A.2.6

a

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

C.2. Technical Expertise

- a. NRC should require every licensee to hire a cadre of graduate engineers knowledgeable in reactor engineering and physics. Each should be provided with training in the specific characteristics of the plant, with special emphasis on integrated plant response and transient behavior. The utility should be required to deploy at least one such engineer supervisor whose qualifications have been examined by the NRC as shift manager (not as an "advisor") on every shift (Vol. I, p. 106; Vol. II, Pt. 2, p. 612, #9). (PC-A.4.a)
- b. A substantially more detailed and upgraded set of requirements should be developed by the NRC for technically competent, NRC-certified, supervisory and management officials to be present on each shift to direct operations (Vol. I, p. 106; Vol. II, Pt. 3, p. 854, #3 & 4, p. 920, #1).

I.A.1.1,  
I.A.2.6,  
I.B.1.1

a

I.A.2.1, I.A.2.6,  
I.B.1.1, I.B.1.2

a

C.3. Station Manning

- a. Minimum manning requirements for each shift need to be increased by the NRC (Vol. I, p. 106; Vol. II, Pt. 2, p. 612, #8 & 9; Pt. 3, p. 854, #2).

I.A.1.3,  
I.A.1.4

a

D. INDUSTRY-WIDE TECHNICAL RESOURCES

D.1. Data and Analysis Centers

- a. One or more data centers should be established by the industry, manned 24-hours a day by nuclear experts, to which essential plant parameters would be telemetered automatically (p. 107).
- b. NRR's "Lessons Learned" Report proposed that each utility be required to maintain a data center of its own where important plant parameters could be read. Additional stations such as these would be useful (p. 108).

III.A.3.4

b

III.A.1.2

a

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

D.2. Industry-Wide Consortium

- a. A number of existing plants now owned by different utilities could be owned an/or constructed or operated by an industry-wide consortium or a public corporation similar to COMSAT (p. 110).
- b. Utilities not meeting safety requirements regarding technical or management competence could be placed into "receivership" by the NRC. Their operation (or construction) then would be undertaken by the consortium as a condition of the NRC license (p. 110).

V.7

b

V.7

b

E. NRC ORGANIZATION

E.1. Single Chief Executive

- a. There is a central and overwhelming need for legislative and executive reorganization to establish a single chief executive with the clear authority to supervise and direct the entire NRC staff. We do not believe that the current administration's proposal to strengthen the NRC Chairman's executive authority goes far enough. (p. 115, 117). (PC-A.1.c)
- b. The single administrator should be responsible directly to the Executive Branch, and to Congress through strong congressional oversight.

None

c (beyond  
NRC purview)

None

c (beyond  
NRC purview)

E.2. Consolidation of Resources Devoted to Operating Reactors

- a. All the agency's resources related to monitoring operating reactors should be consolidated in a single office, probably the current Office of Inspection and Enforcement. The basic design approval function should remain in NRR. Mechanisms should be developed for better coordination between the licensing and operation monitoring offices of the NRC, including strong project management teams to monitor construction and testing of new reactors that have ties to both offices (Vol. I, p. 99, 117; Vol. II, Pt. 1, p. 137, #7).

V.11

a

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

E.3. Independent Nuclear Safety Board

- a. There is a clear and pressing need for an independent organizational entity within the agency that will be responsible for observing, evaluating and making recommendations to improve the quality of the overall performance of the regulatory staff. This need can best be satisfied by the establishment of an independent Nuclear Safety Board (Vol. I, p. 118; Vol. II, Pt. 1, p. 24, #1).
- b. The Board should be composed of a number of persons who are trained in technical disciplines associated with nuclear safety and radiation protection and who are thoroughly experienced with the licensing and regulatory process. (p. 118).
- c. The Board should not duplicate the functions of any office or provide another layer in the review process, but should instead: (1) exercise oversight in the effectiveness of the licensing review process and the regulation of existing plants; (2) advise the Commissioners on regulatory goals and important issues for rulemaking; (3) act as an Ombudsman group to receive complaints and technical dissents; (4) enhance reactor safety by monitoring the effectiveness of the Office of Analysis and Evaluation of Operational Data; (5) monitor the staff's use of the latest analytical and design tools; (6) develop and maintain a capacity to investigate accidents and important safety-related incidents, independent of other offices and the Commission or Administrator; and (7) provide a quality assurance function for the agency's regulatory process as a whole (p. 118, 119).

V.8

a

V.8

b

V.8

b

E.4. Project Management

- a. Strengthening of project management is necessary to obtain an overall balance in the staff's safety evaluations (p. 119).
- b. The need for overall plant and systems analysis has been clearly recognized and should be coordinated through a strong project management organization (p. 119).

V.11

a

V.11

a

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

E.5. Periodic Manager Reassignments

- a. There should be an exchange or rotation of senior level managers on a more pre-planned basis (p. 120).

V.10, V.11

b

E.6. Staff Training

- a. The agency should establish a policy that practical experience in the design, construction, and operation of nuclear power plants and in the problems of radiation protection is a requisite for key staff personnel and arrange an effective program to obtain this experience for the appropriate individuals (p. 120).

IV.D.1

b

E.7. Transfer of Non-Health and Safety Responsibilities

- a. Present NRC responsibilities that do not relate to radiological health and safety should be considered for possible transfer to appropriate agencies. Examples are antitrust responsibilities and jurisdiction over export licenses (Vol. I, p. 121; Vol. II, Pt. 1, p. 25, #9 & 10). (PC-A.4)

V.2

a

E.8. NRC Office Consolidation

- a. We recommend that high priority be given to locating the entire agency in a single location. In the interim, the offices of the Commissioners and their personal staff should be promptly relocated in Bethesda, Maryland (p. 117). (PC-A.1.c)

V.15, V.16

a

F. HUMAN FACTORS ENGINEERING

F.1. Instrumentation

- a. The NRC should develop new standards for instrumentation, computers, print-out devices, CRTs, and other digital displays to facilitate information transfer (p. 127).

I.D.1, I.D.2,  
I.D.4, I.D.5

a

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

- b. Every nuclear plant should be required to install the equivalent of a reactimeter that constantly monitors important plant parameters and is tied to an information and display computer that can call up these parameters on an instantaneous or trend basis. This information would also be telemetered to the offsite data center (p. 127). (PC-A.4.c.ii, D.1, D.3)
- c. Disturbance analysis systems should be developed to provide operators a clearer picture of reactor conditions (Vol. I, p. 127; Vol. II, Pt. 2, p. 612, #5). (PC-A.4.c.ii, D.1)

II.F (all sections)  
I.D.2, III.A.1.2,  
III.A.3.4

b

I.D.5

a

F.2. Control Room Design

- a. Using human factors engineering, the NRC should move forward to develop standardized criteria for control room design such as parameters to be displayed, fundamental grouping of instruments and controls, panel layout, and alarm systems. A deadline for implementation of these requirements related to control room design should be established and enforced (Vol. I, p. 128; Vol. II, Pt. 2, p. 612, #4).

I.D.1, I.D.2,  
I.D.4, I.D.5

a

G. MORE REMOTE SITING AND IMPROVED EMERGENCY PLANNING

G.1. More Remote Siting

- a. Future reactors should be located only at sites that are at least 10 miles, and perhaps more, from any significant center of population (p. 130). (PC-A:6)
- b. Specific criteria for reactor siting should be developed promptly by the NRC in conjunction with other federal and state agencies with experience in emergency evacuation. Considerations should be given to the specific characteristics of the area that influence the effectiveness of evacuation, such as population density, population centers beyond 10 miles, and evacuation routes (p. 130, 131).

II.A.1, II.A.2

a

II.A.1, II.A.2

a

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

G.2. Emergency Planning

- |  |                      |   |
|--|----------------------|---|
| a. Evacuation of citizens at least 10 miles around a nuclear power plant must be considered as an independent means of protection over and above the engineered safety features designed to mitigate an accident and prevent radiological releases. Distances should be regarded as the ultimate defense-in-depth barrier (p. 130).                              | III.A.2.2            | a |
| b. Federal emergency planning functions for accidents at nuclear reactors should be consolidated into a single federal agency. The new Federal Emergency Management Agency (FEMA) appears to be the appropriate agency for such planning (Vol. I, p. 131; Vol. II, Pt. 3, p. 1007, #1). (PC-F.1.b)   | III.B (all sections) | a |
| c. FEMA and the NRC must coordinate closely on emergency planning and FEMA should make maximum use of the work that the NRC has already done and is presently doing (p. 131).  | III.B (all sections) | a |
| d. The specific details of the emergency plan must be worked out at county and local levels (p. 132). (PC-F.1.c)   | III.A.1.1, III.A.2.2 | a |
| e. Consideration must be given by the NRC and FEMA to the methods by which funds can be made available to local communities near nuclear plants for emergency planning. Two possible options are: (1) specific Federal grants could be provided for such activity and (2) the NRC could require utilities to pay for local planning efforts (p. 132). (PC-F.2.d) | III.B.2              | a |
| f. Workable State emergency plans, approved by FEMA, should be a prerequisite to continued operation of existing and future reactors (Vol. I, p. 132; Vol. II, Pt. 3, p. 1027, #4). (PC-F.1.a, F.1.d)  | III.B.2              | a |
| g. Plant operation should not be made absolutely contingent on approved local plans since this would, in effect, give local municipal governments the power to close a plant (p. 131, 132).  | III.A.2.1, III.B     | a |

SPECIAL INQUIRY GROUP RECOMMENDATION

- h. The emergency plan should not be just an abstract document. It should make realistic provisions for such seasonal or other variations as snow storms and large summer populations; and it should provide that the plant may have to be shut down, if the plan becomes inoperable for more than a short period of time (Vol. I, p. 132, 133; Vol. II, Pt. 3, p. 874, #6).
- i. In establishing specific emergency planning distances, probably maximum radiation doses from various projected accidents at different distances from a plant should be carried forward by the Commission into specific criteria that incorporate maximum dose levels, probability factors, and associated time limits (p. 133). (PC-A.6, F.2.a)
- j. Once criteria for minimum workable evacuation areas are established by the NRC, prudence dictates that plants that cannot meet these criteria should be shut down, unless: (1) additional safety systems for the mitigation of accidents can be installed either to reduce the area of likely accident consequences or to increase the permissible time for evacuation; or (2) there is a determination by the President that the temporary continued operation of the plant is vital to the national interest (p. 133).

G.3. NRC Emergency Response

- a. The Executive Management Team (EMT) should have a single director who should exercise the authority of the entire agency during an emergency (p. 134).
- b. Any decision by NRC headquarters to recommend evacuation should be made by the director of the EMT and thereafter should be communicated to the State authorities by the highest official of the NRC available (Vol. I, p. 134; Vol. II, Pt. 3, p. 988, p. 1018, #1).
- c. FEMA and other federal agencies involved should have senior representatives present at the NRC's Incident Response Center (p. 134).

RELATED TMI  
ACTION PLAN TASK

STATUS

III.A.1.1, III.A.2.2

b

III.A.2 (all sections)

b

II.B.6, III.A.2.1

a

V.14

a

III.A.3.1

b

III.A.3.6

b

SPECIAL INQUIRY GROUP RECOMMENDATION

- d. The NRC emergency response plans should be revised to shift the management of the NRC's overall response to the site as quickly as possible (Vol. I, p. 135; Vol. II, Pt. 3, p. 986, #1, 6-13).
- e. The onsite NRC official must have enough clout to assume control of the agency's overall response (normally at least the Regional Office Director level) (Vol. I, p. 135; Vol. II, Pt. 3, p. 986, #2 & 3).
- f. NRC must not be constrained by its own attitudes to take a passive role during an accident, if circumstances demand more direct intervention. If NRC's regulations should make clear the authority to demand information, and in the extreme case to impose its own decisions on a licensee (p. 94). However, the senior NRC official at the site and his technical team should not be authorized to assume command of the plant (Vol. I, p. 135-136; Vol. II, Pt. 3, p. 986, #4 & 5). (PC-A.5)

RELATED TMI  
ACTION PLAN TASK

STATUS

III.A.3.1 b

III.A.3.1 b

III.A.3.1 b

G.4. Radiological Monitoring

- a. DOE should be formally designated by Executive Order as the lead coordinating federal agency, to organize the emergency resources of all other federal agencies in the case of an accident at a commercial nuclear plant requiring radiological monitoring (Vol. I, p. 137; Vol. II, Pt. 3, p. 1039, #1). (PC-F.6)
- b. EPA should be assigned long-term radiological monitoring responsibilities after an accident, and HEW should be given the lead responsibility for population dose assessments and calculation of health impacts (Vol. I, p. 137; Vol. II, Pt. 3, p. 1039, #1). (PC-A.4)
- c. Serious consideration should be given to installation of real time, on-line radiological monitoring devices around every nuclear plant in concentric circles at various distances. These instruments should be capable of being read from the plant control room or some other remote site (Vol. I, p. 137; Vol. II, Pt. 3, p. 874, #2).

III.B (FEMA action) b

III.B (FEMA action) b

III.D.2.4 a

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

H. OVERHAUL OF THE LICENSING PROCESS

H.1. Advisory Committee on Reactor Safeguards

- a. The ACRS has a distinct role to play in the regulatory process and that role should be strengthened (p. 119).
- b. The Nuclear Safety Board might be composed of five full-time members who would also be members of the ACRS. The ACRS would be composed of these five members plus 10 part-time members (p. 119).
- c. Additional staff should be provided to the ACRS. This recommendation could be met by having the Nuclear Safety Board staff provide support for the ACRS (p. 119).
- d. The ACRS's role should be strengthened by removing the requirement that it advise the Commission on every license application, encouraging it to play a more formal role as a party in licensing and rulemaking proceedings, and by upgrading its staff (p. 140).
- e. The ACRS's independence could be enhanced by decreasing the tremendous time commitment required, so that membership can be offered to individuals who cannot afford to devote half or more of their time to the ACRS (p. 140).

V.3

a

V.3, V.8

b

V.3, V.8

a

V.3

b

V.3

b

H.2. Ex-parte Rule

- a. The ex-parte rule should be very significantly limited and applied more rationally. Commissioners should become involved in safety issues pending in particular cases, as long as their involvement is on the record (p. 141).

V.17

a

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

H.3. One-Step Licensing Process

- a. The two-step licensing process should be abolished for nuclear plants of conventional design. Instead, a single licensing review should be held prior to construction (Vol. I, p. 141; Vol. II, Pt. 1, p. 25, #6). (PC-A.10)
- b. Once a license is granted, jurisdiction to oversee construction and confirm that the plant is constructed and consistent with the design plans should be placed in the NRC staff (p. 141).

V.9

a

V.9

a

H.4. Atomic Safety and Licensing Appeal Board

- a. The Atomic Safety and Licensing Appeal Board should not, by default of the Commission, have to continue to interpret, "improve" and apply ambiguous standards (p. 140).
- b. If the Commission is replaced, the Atomic Safety and Licensing Appeal Board's decisions on granting a license should be final and any appeal from the Appeal Board should be directly to the Federal Court (p. 141). (PC-A.10.d)
- c. If the Commission is retained, consideration should be given to abolishing the Licensing Appeal Board and requiring the Commission to consider and approve every new reactor license. Appeal Board members could be transferred to a support office to assist the Commission in this work (p. 142).

V.17

b

None

c (Commission  
not replaced)

V.17

b

H.5. Rulemaking

- a. Generic safety issues and other important policy issues should be handled by the agency or the Commission directly, through rulemaking and policy directives (p. 142). (PC-A.10.b)
- b. Important decisions that lead to the establishment of required safety levels should be promulgated by agency policy through a more open and definitive procedure (p. 142).

IV.E.4

a

IV.E, V.1

b

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

- c. Steps should be taken to eliminate possible protracted public hearings on individual rules and to ensure that the amount of public input is appropriate to the substantive issues involved. For example, rulemaking can often be carried out by consideration of written comments, rather than through public hearings (p. 142). (PC-A.9)

IV.G.3,  
IV.G.4

b

H.6. Office of Public Counsel

- a. An Office of Public Counsel should be established reporting to the head of the agency. The primary functions of the office should be to: (1) provide a source of legal and technical counsel to potential or actual intervenors and to public interest groups; (2) intervene as a party directly in agency rulemaking or licensing proceedings when appropriate; (3) fund and monitor, where appropriate, independent technical peer reviews; and (4) handle details of intervenor financing (p. 143). (PC-A.10.e)

V.5

a

H.7. Intervenor Funding

- a. A program of funding of individual intervenors or groups of intervenors should be adopted for both licensing and rulemaking proceedings, administered through the Office of Public Counsel (p. 143).
- b. Strict requirements should be established that funding be conditioned upon the intervenor propounding non-frivolous issues that are not being effectively advanced by others (p. 144).
- c. Funding should be appropriate to the effort necessary with the final decision on reimbursement being made by the Office of Public Counsel, the Licensing Board, or (in rulemaking proceedings) by the Commissioner or Administrator (p. 143, 144).

V.5

b

V.5

b

V.5

b

H.8. Standardization

- a. Use of standardized designs should be required for all future applications, unless the Commission or administrator grants an exemption for good cause (p. 144).

V.9

b

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

- b. Once a standard model plant is under construction, it should be treated by the NRC as if it were already in operation for purposes of deciding whether new design changes should be required. If a design change were clearly needed to make operating reactors safe, then the change should also be made on those "standard models" under construction (Vol. I, p. 144; Vol. II, Pt. 1, p. 105, #4). (PC-A.4)

V.9

b

H.9. Regulatory Requirements Review Committee

- a. The Ratchet Committee's function is of sufficient importance to warrant its deliberations to be reported in some depth if not actually transcribed completely (p. 146).
- b. The voting members of the Ratchet Committee should be lower than Office or Division Director level (p. 146).
- c. Additional steps should be taken to increase the opportunity for industry, public, and ACRS involvement in the issues considered by the Ratchet Committee (p. 146).

V.11

b

V.11

b

V.11, V.5, V.3

b

H.10. Bases for Safety Reviews

- a. The present licensing review process, including design basis accidents, safety related systems, and the single failure criterion, should now be amalgamated with and ultimately supplanted by a more sophisticated and comprehensive approach to "hazard control" that takes advantage of human factors techniques as well as the significant advances in quantitative risk analyses (Vol. I, p. 148; Vol. II, Pt. 1, p. 24, #3). (PC-A.4.b)
- b. The best way to improve on the existing design review process is to place increasing reliance upon quantitative risk analysis, emphasizing those accident sequences that contribute significantly to risk. We do not suggest that the existing safety review process be supplanted immediately by a more probabilistic review. This will be a long process, but the present review process should be augmented and quantitative methods used as the best available guide to which

II.C.1, II.C.2,  
IV.E.1, V.11

a

II.C.1, II.C.2,  
IV.E.1

a

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

accidents are the important ones, and which approaches are best for reducing their probability or their consequences (Vol. I, p. 150; Vol. II, Pt. 1, p. 24, #3, p. 0190, #9). (PC-D.4)

- c. A hybrid approach to the transition might be appropriate which includes the following: (1) an expanded spectrum of design basis accidents used for safety assessment purposes by using operational experience, research results, lessons from accidents, and advice from the ACRS, all studied through quantitative risk analysis; (2) the effects of multiple equipment and human failures, where the risk of occurrence is significantly high; (3) a risk related scheme for classification of equipment on the basis of safety significance; (4) human factors considerations and operational procedures in the review process; and (5) on a selective basis, a determination whether some design features to mitigate the effects of some Class 9 accidents should be required (Vol. I, p. 151; Vol. II, Pt. 1, p. 24, #3; p. 105, #6; Pt. 2, p. 448, #1, p. 471, #23). (PC-A.4.c)

II.B.5, II.C.1,  
IV.E.1, V.11

a

- d. A thorough review should be made of loss of core cooling and the resultant core damage to determine if certain predictable consequences might be substantially mitigated by design improvements of less than staggering cost or complexity. Such improvements should be specifically evaluated in the normal design review process. Specific examples are: (1) expedited consideration should be given to the use of vented, filtered containment systems to guard against the high pressure rupture of existing containments; and (2) redesign should be undertaken of some of the waste gas and filtering systems that will inevitably be exposed to water and gas coming from the primary system during a major accident (p. 151). (PC-A.7, D.4:c)

II.B.5, III.D.1

a

I. OCCUPATIONAL AND PUBLIC HEALTH

I.1. Occupational Health

- a. Radiation protection, which has always been secondary in importance to reactor operations and reactor safety, must be given a higher priority (Vol. I, p. 155; Vol. II, Pt. 2, p. 342, #1, p. 411, #1, p. 438, #3). (PC-E.4)

III.D.3.1, III.D.3.2,  
I.B.1.1, I.B.1.2

b

SPECIAL INQUIRY GROUP RECOMMENDATION

- b. The NRC should give a greater emphasis to radiation protection in both its safety review and inspections (Vol. I, p. 155; Vol. II, Pt. 2, p. 342, #2, p. 438, #2). (PC-E.4)
- c. At reactor sites, the radiation protection function should be made independent of operations and be elevated to equal importance (Vol. I, p. 155; Vol. II, Pt. 2, p. 438, #1). (PC-E.4)

RELATED TMI  
ACTION PLAN TASK

STATUS

III.D.3.1, III.D.3.2,  
I.B.1.1, I.B.1.2

a

III.D.3.1, I.B.1.1,  
I.B.1.2

c (alternate  
actions)

J. INFORMATION MADE AVAILABLE TO THE NEWS MEDIA

J.1. Emergency Response Planning

- a. A provision for public information should be incorporated in the emergency response plans of both the NRC and the utility, and those plans should be coordinated with State, county or local plans (Vol. I, p. 157; Vol. II, Pt. 3, p. 1074, #1). (PC-G.1)

III.A.1.1, III.A.1.2,  
III.A.3.1, III.B,  
III.C.1

a

J.2. Principal Spokesperson

- a. A senior NRC official should be the principal spokesman at onsite or near-site press conferences during an accident at a nuclear power plant. A utility spokesman should be present at such press conferences to provide simultaneously any differing views or additional information the utility feels is necessary to keep the public fully informed (Vol. I, p. 157; Vol. II, Pt. 3, p. 1074, #2). (PC-G.1.a, G.2)
- b. As appropriate, a State official should also be present at these press conferences and should have sole jurisdiction for public information concerning evacuation and related emergency planning (Vol. I, p. 157; Vol. II, Pt. 3, p. 1074, #2). (PC-G.1.b, G.2)
- c. The utility should maintain responsibility for initial public statements until the NRC estimates an onsite or near-site capability. Press briefings should be held three times a day, or more frequently if dictated by the situation (p. 157). (PC-G.1.a, G.2)

III.A.3.1

b

III.A.3.1

b

III.A.3.1

b

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

K. DISINCENTIVES TO SAFETY

K.1. NRC Evaluation of Utility Finances

- a. The NRC will have to become more aware of the relationship between the business and technical sides of the utility. Consideration should be given to an expanded financial analysis of the utility licensee so that the NRC might be alerted when financial pressures combine to impact on safety (Vol. I, p. 164; Vol. II, Pt. 1, p. 241-246, #1-17). (PC-A.4)

IV.F.2

a

K.2. Communication with Other Regulatory Bodies

- a. The agency needs better methods for making other regulatory bodies aware of the effect of their regulatory programs on the overall safety of nuclear plants (p. 164). (PC-B.6)

IV.F.2

a

COMPARISON OF RECOMMENDATIONS IN VOLUME II OF SIG REPORT (NUREG/CR-1250)  
WITH THE TMI ACTION PLAN (NUREG-0660)

Status of recommendation in the Action Plan:

- a. Recommendation is adequately covered in the Action Plan.
- b. This recommendation (or some part thereof) may not be explicitly included in the Action Plan but it is intended that when the action is undertaken by the lead office, this specific recommendation by the SIG will be taken into consideration.
- c. Staff or Commission do not agree with recommendation or the recommendation is beyond the purview of the NRC. The Action Plan was not changed to account for this recommendation.

2 Note: The enclosed list provides, in the left column, a reference to the Parts and page numbers of Volume II of NUREG/CR-1250 where the recommendation may be found. Many of the recommendations have been paraphrased and/or abbreviated. The list also provides a cross-reference to the same or similar recommendations made in Volume I of NUREG/CR-1250; for example, the parenthetical note (Vol. I-E.3.a) refers to the action plan list of recommendations for Volume I of NUREG/CR-1250.

<u>(Page)</u>	<u>SPECIAL INQUIRY GROUP RECOMMENDATION</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
Part 1 (24)	1. A Nuclear Safety board should be established to exercise independent oversight of the effectiveness of the system (Vol. I-E.3.a).	V.8	a
	2. A statement of regulatory objectives should be developed, including policy on risk objectives and methods, to better use risk assessment techniques (Vol. I-A.1.a).	V.1, IV.E.1	a
	3. WASH-1400 techniques should be emphasized through an expanded risk assessment program (Vol. I-H.10.a, b, c).	II.C.1, II.C.2, IV.E.1	a
(25)	4. The reactor system vendors and the architect-engineer should either be licensed or made accountable by some equivalent system.	II.J.1.3, IV.A	a
	5. An organization should be designated to assure that the quality of the regulations is adequate.	V.11, IV.G.2, IV.G.3	a
	6. The two-step licensing process should be abolished (Vol. I-H.3.a).	V.9	a
	7. Incentives should be established that would result in more information prior to construction, fewer unresolved issues, and less variety in the design of important systems.	IV.E.2, IV.E.3	a
	8. Important licensing areas should be examined and prompt action taken to publish applicable regulatory criteria.	IV.B, IV.E.2	a
	9. The NRC should be relieved of its responsibilities under the Nuclear Nonproliferation Act of 1977 (Vol. I-E.7.a).	V.2	a
	10. The NRC should be relieved of its preclicensing antitrust review responsibilities (Vol. I-E.7.a).	V.2	a
	11. The U.S. Government should decide on a national policy on societal risks (Vol. I-A.1.b).	V.1	b
(105)	1. Rational risk objectives should be established and approved by Congress (Vol. I-A.1.b).	V.1	b
	2. Current requirements should be reevaluated to meet specific risk objectives (Vol. I-A.1.a).	IV.E.1, IV.E.2	b
	3. An explicit rationale should be established for the evaluation of proposed new safety requirements against the criteria "substantial additional protection required for public health and safety" (Vol I-A.1.a).	V.1	a

(Page)

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

Part 1  
(cont'd)  
(105)

4. New requirements should be implemented in a staged, controlled process that provides for holding plant designs standard over significant periods of time.

IV.E.3

b

5. An organizational element to carry out recommendations 2, 3, and 4 above should be established.

V.11

a

6. The existing design basis accident concept should be enlarged (Vol. I-H.10.c).

II.B.5, II.C.1

a

7. The hearing process should be modified.

V.5

a

8. Operating experience should be applied to the development of new or modified regulatory requirements (Vol. I-B.2.a).

I.E.1, V.11

a

9. An internal quality assurance program should be established to ensure that the licensing process is conducted in accordance with Commission approved standards.

V.8

b

10. The Standard Review Plan should be expanded.

V.II

b

(130)

1. Administrative and physical prohibitions must be instituted to prevent all operator actions during an accident or assume the operator will act when he should not.

I.A.2.2, I.A.4.2,  
I.C.7, I.C.8, I.C.9

b

(135)

2. The entire industry and the NRC must broaden their review of operating experience (Vol. I-B.1.a).

I.B.1.1, I.B.2.3, I.B.2.4,  
I.E (all sections)

a

(135)

3. The charter of AEOD should require that the recommendations of AEOD be followed unless the Commissioners or the Director of the applicable Program Office direct otherwise (Vol. I-B.2.a).

I.E.1

b

(136)

4. A program should be developed to reduce the insulation and lack of effective communications that currently exist by:

V.11

b

a. Selection of management dedicated to the interchange of information.

b. An incentive program for identification and exchange of safety information.

c. Regulator interchange conferences with broad agendas including industry and NRC delegates.

d. Interorganizational training on communications.

(Page)

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

Part 1  
(cont'd)  
(137)

5. Each inspection should be an occasion to comment on the general state of affairs at the particular plant.

I.B.2.1

b

6. A permanent unit within each Region reporting to IE headquarters, other NRC offices involved, and AEOD should review and evaluate Licensee Event Reports.

I.B.2.3, I.E.1,  
I.E.2

a

7. Organizational separation between IE and NRR should be reduced by integrating IE and the Division of Operating Reactors into a single group (Vol. I-E.2.a).

V.11

b

(138)

8. Requirements for the maximum number of working days that a Board Notification request can be held at each step in the process should be established and strictly enforced.

V.9

b

9. Simplified event-tree and fault-tree analysis techniques should be used to evaluate each nuclear power plant (Vol. I-H.10.b).

II.C.1, II.C.2

a

10. Event-tree and fault-tree analysis techniques should be used for assignment of priorities and allocation of resources to various safety issues.

II.C.1, IV.E.1

a

11. Better management control over the priority of assigned work should be implemented.

V.10, V.11

b

(199)

1. Systems controlling pressurizer level for anticipated operating transients should be distinctly and separately operated from systems designed to supply cooling water for loss-of-coolant accidents. Systems designed for loss-of-coolant accidents should be designed to actuate in response to breaks in the reactor coolant system and should be designed to operate unabated until their function is served.

II.C.1, II.E.2  
II.F.2, II.G

b

2. The NRC should consider reviewing acceptance criteria for startup tests to determine whether similar component limitations exist.

II.C.1, I.G.2

b

3. Instrumentation should be installed to provide indication of water level in the reactor vessel.

II.F.2

a

4. The NRC should review the B&W pressurizer design to determine whether equipment modifications are needed.

II.E.5

a

5. The NRC should review the reliability of secondary equipment.

II.C.1

a

<u>(Page)</u>	<u>SPECIAL INQUIRY GROUP RECOMMENDATION</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
Part 1 (cont'd) (241)	1. Establish an expanded Financial Analysis office to monitor situations in which business considerations may impact on nuclear safety (Vol. I-K.1.a).	IV.F.2	a
(242)	2. Establish better communication and coordination with the "economic regulators" (Vol. I-K.1.a).	IV.F.2	a
	3. Establish a better system at IE for balancing the pressures created by financial incentives (Vol. I-K.1.a).	IV.F.1	a
	4. Scrutinize the power ascension test program to prevent compromising safety (Vol. I-K.1.a).	IV.F.1	a
(243)	5. Examine the status of the FSAR listing of the power ascension tests to be performed (Vol. I-K.1.a).	IV.F.1	a
(244)	6. PUC's must recognize the unique problems associated with challenging utility decision-making on a nuclear unit (Vol. I-K.1.a).	IV.F.2	a
	7. When nuclear units are involved, a truly future test year should be employed by PUC's (Vol. I-K.1.a).	IV.F.2	a
	8. CWIP in the rate base should be allowed for nuclear units by PUC's to reduce the "lump sum" that is otherwise accumulated (Vol. I-K.1.a).	IV.F.2	a
	9. PUC's should recognize a distinction between a nuclear plant in "commercial operation" and one that is "used and useful" (Vol. I-K.1.a).	IV.F.2	a
(245)	10. PUC's should consider the long-term effects on nuclear plant decision-making of disallowance arguments (Vol. I-K.1.a).	IV.F.2	a
	11. PUC's should improve a dialogue with the NRC and other PUC's to coordinate nuclear plant treatment (Vol. I-K.1.a).	IV.F.2	a
	12. FERC should improve its communication and coordination with the NRC (Vol. I-K.1.a).	IV.F.2	a
(246)	13. FERC should eliminate the threat of disallowance of AFUDC that is implied in Electric Plant Instruction 9D (Vol. I-K.1.a).	IV.F.2	a

(Page)

SPECIAL INQUIRY GROUP RECOMMENDATION

RELATED TMI  
ACTION PLAN TASK

STATUS

Part 1  
(cont'd)  
(246)

14. The IRS should require the use of the qualified progress expenditures basis for recognizing ITC for nuclear units (Vol. I-K.1.a).
15. The IRS should bring its standard for recognizing a nuclear unit into closer conformity with the standards used by other regulators (Vol. I-K.1.a).
16. A study should be conducted of the relative safety of privately owned vs. publicly owned nuclear units (Vol. I-K.1.a).
17. A study should be conducted of the conflicting, ambiguous responsibilities of the various regulatory agencies in this area (Vol. I-K.1.a).

IV.F.2

a

IV.F.2

a

IV.F.2

a

IV.F.2

a

Part 2  
(342)

1. Radiation protection must be given greater emphasis (Vol. I-I.1.a).
2. NRC must change its organizational structure to improve management effectiveness for ensuring that its mandate "to protect public health and safety" is fulfilled (Vol. I-I.1.b).
3. Radiation protection programs at existing reactors should be reexamined to ascertain whether they are adequate to cope with normal and emergency conditions.
4. The public must be fully informed of the manner by which nuclear power plants are designed, licensed, and operated and of the actual risks associated with radiation and radioactive materials.

I.B.1.1, I.B.1.2,  
III.D.3.1

a

V.11

a

III.D.1, III.D.2, III.D.3  
(all sections)

a

III.C (all sections)

a

(368)

1. The design bases for radwaste and other related systems, such as the makeup and purification systems, should be reexamined to determine appropriate design criteria for the expected levels of activity and volumes that will be generated in both normal operation and accident situations.
2. Review of radwaste systems should include all related systems, such as the Industrial Waste Treatment System, to ensure that all potential releases are treated.
3. Radwaste system components should be periodically tested for leaks, and any leaks exceeding a minimum acceptance level should be repaired.

II.B.8

a

II.B.8, III.D.1.1

a

III.D.1.1, III.D.1.2,  
III.D.1.3

a

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SPECIAL INQUIRY GROUP RECOMMENDATION

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|--------|--|---|--------|
|        | 4. Consideration should be given to locating systems such as the makeup and purification system in an isolating building.  | III.D.1.4                                 | b      |
|        | 5. Consideration should be given to the installation of tie-lines back to containment from components outside containment having the potential to contain significant activity.            | III.D.1.1                                 | a      |
|        | 6. Methods should be developed for inplace testing of ventilation systems to ascertain overall filter system performance when needed.  | III.D.1.3                                 | b      |
|        | 7. Procedures should be developed for the evaluation of spent carbons exposed to accident conditions and to consider the effect of high concentrations of noble gas and iodine.            | III.D.1.3                                 | a      |
|        | 8. Certain filtration systems should be designated and designed for use only after an accident; separate filter systems should be provided for normal operation.                           | II.B.8, III.D.1.3                         | b      |
|        | 9. Dampers around filter systems should be eliminated or improved to minimize leakage.   | III.D.1.3                                 | a      |
|        | 10. To increase the radioiodine removal capabilities, consideration should be given to co-impregnating carbons with an amine, such as triethylenediamine, and to using deeper carbon beds. | III.D.1.3                                 | a      |
| (395)  | 1. NRC should reevaluate requirements for environmental radiological monitoring for released radioactive materials in both normal and accident conditions.                                 | III.D.2.1, III.D.2.4, III.D.2.6           | a      |
| (411)  | 1. Licensees, in their design, and NRC, in its review, should assure that adequate consideration is given to radiation protection matters (Vol. I-I.1.a).                                  | II.B.2, III.D.1 (all sections), III.D.3.1 | a      |
| (419)  | 2. The functions of radiation protection and chemistry should be separated and technicians should not be required to perform in both roles.  | I.B.1.1, I.B.1.2, III.D.3.1               | b      |
|        | 3. The duties of a radiation protection manager should be clearly specified and performed by a qualified individual.   | I.B.1.1, I.B.1.2, III.D.3.1               | b      |

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Part 2 (cont'd) (419)	4. NRC should require minimum qualifications for the positions of Radiation Protection Foreman and Chemistry Foreman.	I.A.2.6, I.B.1.1, I.B.1.2, III.D.3.1	b
(420)	5. Technical Specifications should be amended to include the positions of Radiation Protection Foreman and Chemistry Foreman.	I.B.1.1, I.B.1.2, III.D.3.1	b
(420)	6. Technicians should be given training adequate to meet FSAR requirements and to develop and maintain adequate job skills.	I.A.2.2, I.A.2.6, I.B.1.1, I.B.1.2, III.D.3.1	a
(421)	7. Met Ed should take appropriate steps to eliminate the serious communications problems in the radiation protection organization.	I.B.1.1	b
(421)	8. Emergency Plans should provide for radiation protection staff response to inplant radiation hazards.	III.D.3.1	a
(423)	9. Radiation protection procedures should be followed during emergencies, and appropriate documentation should be maintained.	III.D.3.1	a
(423)	10. NRC should require the implementation of an adequate radiation protection training program.	I.A.2.2, I.A.2.6, I.B.1.1, III.D.3.1	a
(424)	11. NRC should inspect for actual competence of the trainees and trainers.	I.A.2.2, I.A.2.3, I.A.2.7, I.A.3.4, I.B.1.1, III.D.3.1	b
(424)	12. NRC and the licensee should review radiation protection staffing and organization to assure that radiation protection functions are fulfilled by adequately trained personnel.	I.B.1.1, I.B.1.2, III.D.3.1	a
(424)	13. NRC should develop guidance regarding the specific use and training of "rent-a-techs" at licensed facilities.	I.A.2.6, I.B.1.1, III.D.3.1	a
(424)	14. NRC should examine the feasibility and advisability of licensing or certifying radiation protection personnel at commercial nuclear power reactors.	I.A.3.4	a
(424)	15. NRC should defer action on a petition (PRM-20-13) presently pending before the Commission, which requests that radiation protection personnel at all levels in licensed activities be certified by the Commission until the aforementioned study is completed.	I.A.3.4	a

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Part 2 (cont'd) (429)	16. NRC should reassess the requirements for inplant fixed-radiation monitoring instruments.	II.F.1, III.D.3.3	a
	17. NRC should evaluate and specify requirements for type, quality and quantity of operational portable radiation survey instruments for both normal and accident conditions.	III.D.3.3	a
(430)	18. NRC should require that the responsibility for the respiratory protection program be vested in a single individual and that technicians be permanently assigned to perform the tasks of inspection, maintenance and decontamination of respiratory protection equipment.	I.B.1.1, I.B.1.2, III.D.3.1	b
	19. NRC should specify the minimum number of functional respiratory protection devices required by type and size for both normal operations and for emergencies.	III.D.3.2	a
(432)	20. Met Ed should establish an improved system for control, issuance and recovery of personnel dosimeters.	III.D.3.1	b
	21. Met Ed should assure that their personnel dosimetry program is managed and implemented by competent personnel.	I.B.1.1, III.D.3.1	b
	22. NRC should require licensees to have adequate personnel dosimetry services, including sufficient staff, and that personnel dosimetry records, evaluations and referrals for bioassay be maintained during emergencies	III.D.3.1, III.D.3.2	b
(438)	1. The radiation protection function at commercial nuclear power plants should be independent of operations and be elevated to equal importance with production (Vol. I-I.1.c).	I.B.1.1, I.B.1.2, III.D.3.1	c (alternate actions)
	2. NRC should give greater emphasis to radiation protection in its licensing review and inspection processes and should reassess the radiation protection programs at commercial nuclear power reactors (Vol. I-I.1.b).	I.B.1.1, I.B.1.2, III.D.3.1	a
	3. NRC should give additional emphasis to radiation protection and radiological health (Vol. I-I.1.a).	III.A.1.1, I.B.1.1, I.B.1.2, III.D.3.1	a

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Part 2 (cont'd) (438)	4. NRC should develop a regulatory base for assuring that inplant radiological conditions resulting from an accident are considered in the planning of emergency procedures.	III.A.1.1, III.D.3.1	a
(448)	1. The required "design basis" for nuclear power plants should be reconsidered, as well as the importance and impact of core melt and disruption accidents in the licensing process (Vol. I-H.10.c).	II.B.8, II.C.1, II.C.2	a
(454)	1. The frequency of PORV operation in B&W plants should be reduced.	II.K.2, II.E.5.1	a
(455)	2. The capability of PORVs to discharge water or two-phase fluid should be established.	II.D.2	a
(456)	3. Bounding thermohydraulic analyses should be reevaluated to determine their accuracy in predicting system variations.	II.E.2.2, II.E.2.3	a
	4. Automatic reactor protection actions should be derived from independent process variables.	II.F.4	a
	5. Automatic actions through coincidence of independent process variables should be limited for nonreactor protection functions.	II.F.4	a
	6. Pressurizer level instruments should be designed to criteria applied for instrumentation systems important to safety, and emphasis should be placed on achieving diversity in the measured parameters.	II.F.3	b
(458)	7. The need for immediate trip of reactor coolant pumps should be reevaluated.	II.K.1	a
	8. ECCS capacity should be sufficient to preclude uncover of the core when the reactor coolant pumps continue to run during any accident.	II.E.2, II.K.3	a
	9. Control logics for all complex systems and components should be made available to the operators to assure their continued familiarity with all control permissives and inhibits.	I.A.2.1, I.A.3.1	b

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Part 2) (cont'd) (460)	10. The use of the steam generators as a heat-removal mechanism during transient-initiated and small-break accidents should be a matter of careful discussion among the regulatory, vendor, and utility staffs.	II.K.3	a
(461)	11. The addition of remotely operable vent valves, or the modification of presently installed manual vents, appears to be a desirable change.	II.B.1	a
(461)	12. Transient and LOCA reanalyses should be performed to confirm important parameters for actuation of reactor building isolation from direct measurements of such parameters.	II.E.4.2	a
(462)	13. Reevaluation should be made to determine the criteria for defeating an isolation signal for any component and system during an accident mitigation sequence.	II.E.4.2	a
(462)	14. The principal sources of hydrogen generation should be determined more accurately for the implementation of an appropriate hydrogen recombination system or consideration should be given to containment designs that would not require hydrogen recombination systems.	II.B.5	a
(463)	15. Engineered safety feature systems and components should be capable of performing their intended function without operator intervention for at least 10 minutes following a real safety feature actuation signal initiation.	II.C.1	b
(464)	16. A thorough evaluation should be performed to determine adequate response requirements for automatic or manual reinitiation of engineered safety features following inadvertent loss of power supply during a critical transient or accident mitigation sequence.	I.A.4.2, I.C.9	b
(464)	17. The engineered safety features actuation signals should automatically remove components and systems important to safety from off-normal position and place them back to normal alignment for safety actuation.	II.C.1.1	b
(464)	18. Control circuit components should be designed and periodically tested at expected degraded power supply conditions to ensure that they are capable of performing their intended function.	II.F.4	b

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Part 2 (cont'd) (465)	19. An explicit assessment of the effects of the core barrel vent valves should be included as part of the small-break loss-of-coolant accident analyses begun since the TMI-2 accident (B&W designed plants only).	I.C.1, II.K.1	a
(466)	20. Analysis should be performed to determine the consequences of inadvertent interruption of engineered safety features from loss of power at any time during a transient or accident mitigation sequence.	II.C.1, II.C.2	b
(468)	21. Surveillance procedures should not permit the simultaneous defeat of redundant systems important to safety.	I.B.1.3, I.C.6, I.C.9, I.D.3, II.C.1, II.K.1	a
(471)	22. The emergency feedwater system should be designed with a diverse and redundant automatic safety feature actuation of pumps, discharge valve alignment and emergency steam generator level. This automatic actuation should be independent of the integrated control system.	II.E.1.2, II.K.3	a
(471)	23. The distinction between "safety" and "nonsafety" related systems should be replaced by a graded scale of significance (H.10.c).	II.C.1	b
(471)	24. System designs should consider implementation of piping configurations that can permit periodic testing of valves at system conditions expected during emergencies.	II.E.6, II.E.3	a
(471)	25. Interconnections of control, process and safety systems should be limited unless suitable isolation can be provided to ensure that failures in the control or process systems do not cause unacceptable plant disturbances.	II.C.3	a
(485)	1. Utilities should install Malfunction Detection Analyzers in each plant to assist operators in controlling the plant.	I.D.5	a
(486)	2. Design of cables and some sensors for operation after flooding should be considered, and their required time for postaccident operation should be lengthened.	II.F.3	a
(487)	3. Accident monitoring and safe shutdown systems should be qualified to function under full accident conditions.	II.F.3	a

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Part 2 (cont'd) (487)	4. A category for "systems required to maintain the plant in a stable condition" should be established. These systems should be qualified to operate in full accident conditions.	II.C (all sections)	b
	5. Careful review of instrument and control systems should be carried out to make sure that items such as pressurizer heaters do not get left out or get placed in improper categories.	II.C.1	a
	6. Administrative review of instrument repair records is necessary so that unreliable systems will be upgraded.	II.C.4	a
	7. Stricter control on strip-chart marking should be instituted.	I.D.1:1, I.F.2	b
	8. Data presented to the operators should be reviewed to make sure that important data are continuously available.	I.D.1, I.D.2	a
	9. Consideration should be given to layout so that important data can be readily assimilated without distraction by less important displays.	I.D.1, I.D.2	a
	10. Recording devices meant to document data for historical reconstruction of accidents or off-normal incidents, such as control room voice recorders, magnetic tape, disk recording of important parameters, and dedicated strip charts, should be installed. (Vol. I-F.1.b)	I.D.5, III.A.1.2	b
(612)	1. NRC should develop an interdisciplinary human factors capability.	V.11	a
	2. NRC should require the development and implementation of formal human factors programs by utilities, vendors, and architect-engineer organizations.	I.B.1.1	b
	3. NRC should promulgate detailed regulations for the design of new nuclear power-plant control rooms requiring the application of human factors principles to such designs.	I.D.4	a
	4. NRC should initiate a program of control room enhancement. In the near term the NRC should conduct an onsite human factors evaluation of control rooms in operating plants and plants for which operating licenses are imminent. On a long term basis, the NRC should conduct an indepth evaluation of nuclear power plant control rooms to determine the adequacy of the man-machine interface (F.2.a).	I.D.1, I.D.2	a

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Part 2 (cont'd) (612)	5. Additional diagnostic operational aids, such as logic trees or disturbance analysers, should be required in all control rooms (F.1.c).	I.D.5	a
	6. NRC should certify and approve operator training facilities, training instructors, and training curricula (C.1.b).	I.A.2.3, I.A.2.6, I.A.2.7	b
	7. NRC should require increased emphasis on diagnosis and accident response training of control room operators (C.1.a).	I.A.2.1, I.A.2.2, I.A.2.5, I.A.2.6, I.C.9, I.A.3.1, II.B.4	a
	8. The operator selection and training criteria, manning levels, procedural format, and content should consider analysis and research performed to determine operator responsibilities and actions during normal and abnormal conditions (C.3.a).	I.A.1.3, I.A.1.4, I.A.2.1 I.A.2.2, I.A.2.6, I.A.4.2, I.C.3, I.C.9	a
	9. Until recommendation 8 can be implemented, the NRC should require that all hot operations shifts be manned by a minimum of one SRO, two CROs and one additional individual with demonstrated and tested capabilities in abnormal system diagnosis. Two of these individuals should be required in the plant control room at all times (C.2.a, C.3.a).	I.A.1.1, I.A.1.3, I.A.2.1 I.A.3.1, I.B.1.1	a
(613)	10. NRC should require power plant operations supervisors and management personnel to be trained in investigation techniques and reporting methods for events involving human behavior.	I.A.2.6	b
	11. NRC should conduct an immediate review of the emergency procedures of all operating plants to identify and correct problems associated with symptoms identification, technical accuracy, and systems compatibility.	I.C.1, I.C.7, I.C.8, I.C.9	a
	12. NRC should develop improved methods for measuring operator performance and the effectiveness of training programs in meeting training objectives.	I.A.2.3, I.A.2.4, I.A.3.1, I.A.3.2	a
	13. The NRC should consider the licensing of auxiliary operators and testing and maintenance personnel for specific plants.	I.A.3.4	a
(645)	1. The public in the vicinity of nuclear power reactors should be well-informed about reactor operations and malfunctions.	III.C (all sections)	a

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Part 2 (cont'd) (645)	2. Timely, relevant, and understandable information about the status of an accident and likely offsite consequences should be made available to State, county, and local decision-makers responsible for recommending or implementing offsite protective action.	III.A.1.2, III.A.3.6, III.B.1, III.B.2	a
Part 3 (854)	1. Prompt action should be taken to upgrade the diagnostic and emergency response capabilities of personnel licensed to operate reactor plants and their supervisors up to at least the level of unit superintendent. This recommended action should be assigned the highest priority (C.1.a).	I.A.2.1, I.A.2.2, I.A.2.5, I.A.2.6, I.C.1, I.C.9, I.A.3.1	a
	2. On the same priority basis, on-shift manning levels should be increased to levels determined to be needed by the results of accident response task analyses (C.3.a).	I.A.1.3, I.A.1.4, I.A.2.2	a
	3. Supervisors of licensed reactor operators, up to at least the level of unit superintendent, should be required to hold a senior reactor operator license on any unit to which they are assigned supervisory responsibilities for normal or emergency operations (C.2.b).	I.A.2.1, I.A.2.2, I.A.2.6, I.A.3.4	b
	4. The shift manager or equivalent, who is assigned the responsibility for the safety of operation and in direct charge of the operators in the control room, should have a college degree in a technical discipline closely related to reactor plant design and operations, and at least 3 years of operating experience. This requirement should be met as soon as practicable but no later than July 1, 1983 (C.2.b).	I.A.2.6	a
	5. The duties and responsibilities and the qualifications and training of all personnel assigned to support the unit operators and their supervisors in maintaining the unit should be reassessed and upgraded to be consistent with the upgraded levels of the reactor operators and their supervisors.	I.A.2.2, I.A.2.6, I.B.1.1	a
	6. Revise emergency procedures for inplant response to accidents to have plans available for the organization and efficient use of off-duty operating staff personnel who would be expected to report to the site in the event of an accident.	I.B.1.1, I.C.9, III.A.1.1	a

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7. Take immediate action to provide the operations staff with the means to acquire prompt expert advice from offsite sources. Immediate implementation of interim measures that will be developed into a final program should be approved by the NRC in accordance with its requirements no later than January 1, 1982.

I.B.1.1, III.A.1.1

a

8. Develop procedural guidance for the use of the operations staff in responding to situations beyond the normal design bases of the facility.

I.C.1, I.C.9, II.B.4

a

9. Develop plans for effective mobilization and use of industry resources for the mitigation of consequences and for recovery from reactor accidents.

I.B.1.1, III.A.2.1,  
III.A.2.2

b

(874)

1. Plant procedures and personnel training requirements related to radiological emergency recognition and response should be reviewed and upgraded.

I.C.1, I.C.9,  
III.A.1.1, I.A.2.2

a

2. Real-time, on-line radiation monitoring equipment should be installed around all nuclear power plants (G.4.c).

III.D.2.4

a

3. Inplant and portable radiation monitoring instruments and trained personnel should be available at all nuclear power plants.

III.D.3.2, III.D.3.3  
III.D.2.4, III.D.2.1  
I.B.1.1, I.A.2.2

a

4. Emergency plans should include provisions for a prolonged radiological response effort and clear chain of command. In addition, guidance should be provided to assure that the emergency director is promptly informed of critical information, and that State and Federal agencies are kept accurately informed of plant status and radiological conditions.

III.A.1.1, I.B.1.1,  
I.C.3

a

5. Communications equipment should be provided at all nuclear power plants to assure unimpeded contact between inplant locations and all locations where offsite monitoring teams are likely to perform radiation dose rate measurements.

III.A.1.1

a

6. Emergency plans should be suitably definitive to provide an adequate response to a realistically anticipated accident under adverse conditions, such as inclement weather, minimum allowable staff, and a rapidly developing accident (G.2.h).

III.A.1.1, III.A.2.2,  
III.B (both sections)

b

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Part 3 (cont'd) (892)	1. The NRC should require that the emergency plans for all nuclear power plants include provisions to assure prompt technical support to plant operations personnel coping with a reactor accident and its consequences. Also, the NRC should ensure that adequate technical and managerial personnel and resources will be requested and integrated into a preplanned emergency organization for response to and recovery from an accident.	III.A.1.1, I.B.1.1, I.B.1.2	a
(911)	2. The NRC should interact with nuclear industry organizations in defining the criteria and guidance for emergency planning.	III.A.2.1, III.A.3.6, I.B.1.1	a
(911)	1. The NRC should identify and qualify those NRC personnel relied upon to obtain or evaluate critical information during nuclear power plant or radiological emergencies.	III.A.3.5, IV.D, III.A.3.1	a
(911)	2. The NRC should provide training, equipment, and guidance that assure rapid, efficient, and comprehensive gathering of information by NRC personnel during nuclear power plant or radiological emergencies.	III.A.3 (all sections)	a
(911)	3. The NRC should determine the minimum staffing and composition of the initial NRC response teams, both onsite and offsite, for nuclear power plant accidents and other foreseeable radiological emergencies.	III.A.3.1	a
(920)	1. Prompt action should be taken to upgrade the qualification and experience requirements for personnel managing and supervising activities at nuclear power plants. A suitable method of certification of the qualification and experience requirements should be established. These actions should be completed as soon as practicable but no later than January 1, 1982 (C.2.b).	I.A.2.2, I.A.2.1, I.A.2.6, I.A.2.3, I.A.2.7	b
(920)	2. The NRC should require that each key management position at a nuclear power plant be staffed by a qualified person working full time in that position.	I.B.1.1, I.B.1.2, I.A.2.2	b
(920)	3. The NRC should perform a timely evaluation of personnel changes in key plant management positions and changes in the plant organizational structure to assure that adequate staffing is maintained.	I.B.2.3, I.B.1.1	a

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Part 3 (cont'd) (920)	4. Offsite safety review committees, or equivalent, should include within the scope of their activities the evaluation of personnel changes in key management positions and the evaluation of changes in plant organizational structure.	I.B.1.1	b
	5. Qualifications for personnel participating on safety review committees should be established by the NRC.	I.B.1.1, I.A.2.6	a
(930)	1. Regulatory Guide 1.101 should be revised to include a requirement that each nuclear utility employee with an emergency response assignment receive appropriate training and participate in at least one emergency plan drill each year.	III.A.2.2	a
	2. The NRC should expedite review and upgrading of existing emergency planning and preparation requirements.	III.A.1 (all sections) III.B (all sections)	a
(986)	1. In an emergency of predetermined severity, the NRC should send an emergency response team to the site. The team should be drawn principally from personnel in the appropriate Regional office (G.3.d).	III.A.3.1	b
	2. Whenever this team is activated and sent to the site, its leader should be the Regional Director or the Regional official who, in the absence of the Director, would become the Acting Regional Director (G.3.e).	III.A.3.1	b
	3. The onsite team leader should have the delegated authority to manage and direct the NRC's entire emergency response and to be the Agency's spokesman concerning the emergency response from the time of the team's arrival (G.3.e).	III.A.3.1	b
	4. This authority should include the power to require the licensee to take such action as the onsite team leader deems appropriate to ensure adequate protection of the public's health and safety. Also included should be the authority to make a final recommendation to State and local officials on behalf of the the NRC about the appropriateness of various protective actions, including evacuation (G.3.f).	III.A.3.1	b
	5. The onsite team leader's authority should be made known through preplanned notification procedures to all NRC officials; officers and employees of the licensee; and appropriate Federal, State and local officials (G.3.f).	III.A.3.1, III.A.3.6	b

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| 6.  | The functions of the onsite team should include, among others, the following: (1) observing, evaluating, and reporting on operational and radiological status and activities; (2) giving advice or orders to the licensee regarding accident recovery; and (3) advising State and local authorities on public protection actions. A program plan should be prepared in each region. | III.A.3.1                          | a |
| 7.  | Regional project inspectors or, where applicable, resident inspectors should be part of the onsite team. These managers and inspectors must all have extensive exposure to the plant and good knowledge of its design, layout, operating procedures, and other essential information.   | III.A.3.1                          | b |
| 8.  | Procedures should be prepared that explain in detail the onsite team's role. Team members should be adequately instructed as to who is team leader, what they should do upon arrival at the site, what to look for and report, to whom to report, and from whom they will receive instructions.   | III.A.3.1,<br>III.A.3.5            | a |
| 9.  | The procedures should describe the emergency response structure that will be organized by the licensee during an emergency (G.3.d).   | III.A.3.1                          | b |
| 10. | The procedures should describe State and local officials and offices that may play a role during the emergency (G.3.d).   | III.A.3.1, III.A.3.6,<br>III.A.2.2 | a |
| 11. | Upon arrival at the site, the onsite team should set up an operations center at a pre-designated location, to which all available information concerning plant and offsite conditions will be transmitted. The licensee should set up a similar operations center at the same location (G.3.d).   | III.A.3.1, III.A.1.2               | a |
| 12. | Upon arrival at the site, the onsite team should immediately establish and maintain telephone contact with those individuals whom the licensee has designated to have direct supervisory authority (G.3.d).   | III.A.3.1                          | b |
| 13. | Recognizing the onsite team leader's obligations as agency spokesman, the onsite team should be organized so that the team leader's deputies and principal managers in the normal organizational structure are designated and prepared to assume primary responsibility for supervising the work of all NRC personnel at the site (G.3.d).  | III.A.3.1                          | b |

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| Part 3<br>(cont'd)<br>(987) | 14. When the NRC is first notified of an emergency requiring activation of an onsite team, NRC Headquarters officials should bear the responsibility for managing and directing the Agency's emergency response until the onsite team arrives at the site.  | III.A.3.1,<br>V.14                      | a             |
|                             | 15. A duty officer should be available at the Headquarters incident response center on a round-the-clock shift basis. When notified of an emergency requiring activation of an onsite team, the duty officer should supervise activation of the Headquarters' center.   | III.A.3.1                               | a             |
|                             | 16. Upon notification of an emergency requiring activation of an onsite team, the Headquarters duty officer should immediately establish telephone contact with individuals to whom the licensee has designated direct supervisory authority.   | III.A.3.1                               | b             |
|                             | 17. Once the onsite team leader takes command, the function of the personnel at the Headquarters incident response center should be to provide support and advice to the onsite team when and as requested.   | III.A.3.1                               | b             |
|                             | 18. The support and advisory functions of Headquarters should be provided as requested by the onsite team leader.   | III.A.3.1                               | b             |
|                             | 19. The Headquarters Incident Response Plan should describe the support and advisory functions that may have to be performed in any given emergency, and should specify which component office at Headquarters will be responsible for providing each such function. The Plan should also describe the management structure each office will use in discharging an assigned function. | III.A.3.1                               | a             |
|                             | 20. Except for the command function at the incident response center just mentioned, the Commission should not interject itself into the management's response to an emergency. We expect that individual Commissioners will keep closely informed and act as spokesmen within the Government.   | III.A.3.1                               | b             |
|                             | 21. Automatic data retrieval systems should be developed to telemeter important plant data to the onsite response team's operations center, as well as to the affected regional office and the Headquarters incident response center.   | III.A.3.4                               | a             |

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22. Permanently open communication pathways should be maintained between each site and the regional and Headquarters response centers. These communication lines should be backed up by alternative means of communication resistant to loss from possible environmental conditions.

III.A.3.3

a

(988)

23. In an emergency, the oral communication of information among the onsite team members, the regional office, and Headquarters should be the responsibilities of individuals specifically assigned to only this task.

III.A.3.1

b

24. In an emergency, separate pathways should be provided for the oral communication of operating and radiological information.

III.A.3.3

a

25. The oral communication of information should be transmitted by the most direct means possible to the party having the principal need for the information. Thus, to the extent possible, emergency plans should establish communications priorities concerning the different categories of information.

III.A.3.1

b

26. Each region should have available what has previously been determined to be the emergency equipment required to perform all necessary independent measurements, and to allow the NRC emergency response team to fulfill its mission.

III.A.3.1, III.D.2.6

a

27. The regional and Headquarters incident response centers all should have duty officers available on a round-the-clock basis to immediately receive the licensee's notification.

III.A.3.1

b

28. The NRC should prepare and publish a policy statement concerning its role in responses to nuclear accidents.

III.A.3.1

a

29. The NRC's present policy referred to in paragraph 024 of Manual Chapter 0502, "NRC Incident Response Program," should be clarified. The NRC should prepare and publish a policy statement concerning whether and under what conditions the NRC will intervene to direct recovery actions following an accident. The statement should clarify the responsibilities of licensee management unless and until these are preempted by the NRC.

III.A.3.1

a

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30. The NRC should consider in advance the assistance that will be needed by the State, licensee, the NRC, and other Federal agencies in any nuclear accident. Agreements should be established between the NRC, the DOE, and other agencies as to what each will do in an emergency, and how and by whom the activities will be coordinated.
31. The Region's onsite team and the Headquarters support team should include a distinct group of officials whose assigned function is to evaluate contingencies.
32. The NRC support team at Headquarters should be organized in advance to identify centers of expertise for different technical areas. Based on the bad experience in one particular area during the TMI response, the NRC should establish within the staff an organization with concentrated expertise in reactor chemistry matters.
33. The contingency group should appraise the need for public protective measures as soon as possible after responding to an emergency.
34. The NRC should have a clearly identified single spokesman for making recommendations on protective actions. There should be a clear advance knowledge on the part of State and local officials as to who this NRC spokesman is, with whom he will consult, and to whom he will make his recommendations. The spokesman for NRC should be the onsite team leader.
35. The NRC should develop a policy about dealing with briefing requests from State and local officials, Congress, other Federal officials, the media, and others during emergencies. A special team shall be established to conduct these briefings.
36. The NRC should advise all other response team members--at Headquarters, the Regional office, and at the site--to defer to the special team with respect to media briefings or discussions. A single location at or near the site for all media briefings should be considered.
37. The information policy should be issued, along with an implementing procedure, as part of the emergency response plan. The NRC should inform the States, the Congress, the media, and the public of this policy, and request that they work only with this special information group.

III.A.3.6

a

III.A.3.1

b

III.A.3.1

b

III.A.3.1

b

III.A.3.1, III.C.2

b

III.C (all sections)

b

III.A.3.1, III.C  
(all sections)

b

III.A.3.1, III.C  
(all sections)

b

(989)

(Page)	<u>SPECIAL INQUIRY GROUP RECOMMENDATION</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
Part 3 (cont'd) (989)	38. The NRC should intensify its efforts to keep up-to-date information on nuclear accidents available on a prerecorded tape accessible to the public by direct dial phone.	III.A.3.3, III.C.1	b
	39. Individuals who write preliminary notification documents (PN's) should be properly trained and instructed to prepare PN's for nontechnical readers.	III.A.3.1, III.C,	b
	40. The NRC should prepare and be able to provide to Government officials and others the documents appropriate to assist them in understanding technical explanations provided by the NRC staff during or after a nuclear accident.	III.C.1	b
	41. The NRC should prepare multiple plant accident and offsite hazard descriptions for each plant using realistic analyses and reference meteorology conditions. These descriptions should cover a wide range of serious accidents, including core melt sequences. They should be made a part of the emergency plan documentation.	III.A.2 (both sections)	a
(1007)	1. On September 16, 1978, Federal Reorganization Plan No. 3 established the Federal Emergency Management Agency (FEMA) as the agency responsible for centralized overall planning and coordination for Federal agency response to emergencies, including nuclear reactor accidents. We endorse this action (G.2.b).	III.B (both sections)	a
(1008)	2. To handle planning and coordination, FEMA must have sufficient authority to generate a timely response from other Federal, State, and local agencies. Such authority must recognize the responsibility of the NRC, State and local governments, and the utility.	III.A.3.6(2), III.B	a
	3. FEMA must develop a comprehensive Federal response plan for peacetime nuclear emergencies.	III.A.3.6	a
	4. The proposed NRC appropriations bill (S. 562) requires that an NRC emergency plan be developed that provides appropriate details for rapid agency response to reported incidents at nuclear facilities. Some of these provisions are in the area of NRC interface with other Federal agencies; hence, coordination with other agencies will be required.	III.A.3.6(2)	a

(Page)	SPECIAL INQUIRY GROUP RECOMMENDATION	RELATED TMI ACTION PLAN TASK	STATUS
Part 3 (cont'd) (1009)	5. There could be a substantive conflict between elements of the State law that authorize FEMA to exert command control over local emergency actions and the portions of the law that charges the local jurisdictions with the responsibility for protection of the health and safety of their citizens. This possible problem should be carefully considered by the States.	III.B (both sections)	b
(1018)	1. Official channels for the transmittal of protective action recommendations to the responsible decision authority must be set up in advance and understood by all parties (G.3.b).	III.A.3.1, III.A.3.6, III.C.2	b
	2. Procedures must be established in advance by the decision-making authority for verifying protective action recommendations and their bases. These procedures must provide for timely verification, according to the temporal nature of the public hazard.	III.A.3.1, III.B (both sections)	a
	3. The NRC, in cooperation with HEW and EPA, must develop clear and commonly acceptable protective action guidelines (PAGs) that are understood by decision-makers and can be applied in a relatively unambiguous manner.	III.A:3.1	a
	4. The NRC, in cooperation with EPA, HEW, and FEMA, must evaluate the array of protective actions available in the event that PAGs may be exceeded and develop recommendations for action accordingly.	III.A:3.1 III.A.3.6	a
	5. FEMA must study and, to the extent reasonable, lower possible economic barriers to protective actions, such as evacuation.	III.B (both sections)	b
(1025)	1. Each Federal, State, county, and local organization involved in emergency response must develop complete, integrated emergency response plans which prescribe the organization's functions, its emergency organization, and its modus operandi and assure that proper information will be obtained and disseminated by the agency so it can discharge its responsibilities.	III.A.1.1, III.B (both sections)	a
(1026)	2. State, county, and local plans for response to nuclear plant accidents must include the following:	III.A.1.1, III.A.2.2, III.B (both sections)	b
	a. It must be clearly stated that Federal agencies do not have the authority to order an evacuation.	III.A:3.6, III.A.3.1	

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Part 3  
(cont'd)  
(1026)

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- b. The division of authorities and responsibilities must be clearly spelled out. III.A.3.1, III.A.3.6 b
- c. Federal, State, and local relationships must be clearly defined and the resources that each agency could provide must be predetermined.
- d. Local jurisdictions must develop emergency plans in sufficient detail to assure that their responsibilities are understood. Matters requiring detailed planning include the size of planning zones; evacuation routes; designation of host areas; communications procedures for plant personnel to provide specific information concerning the extent of the hazard to State, county, and local government officials; coordination of public information releases; and tests and drills.
- e. Funding is required for establishing and maintaining county and local emergency preparedness. We believe funding assistance to county and local governments for nuclear facility emergency planning is necessary. Such funds could come from the NRC, FEMA, the State, or the utility. We believe the utility should fund the county and local effort necessary for effective nuclear emergency planning. III.B b
- f. Training of State, county, and local emergency response personnel must be provided by the utility in areas such as basic plant operations and the site emergency plans. III.A.1.1 b
- g. FEMA should offer assistance to the States in establishing and/or carrying out training programs for State, county, and local officials. III.B.2 a
- h. Plans must consider impacts on transportation, food, shelter, and communications. III.A.2.2 a
3. FEMA and the NRC should study the Mississauga evacuation, as well as other evacuations of populated areas, to determine: II.A.2, II.B.6, III.A.3.5 a
- a. The extent to which prior planning can improve the effectiveness of an evacuation. III.A.3.1
- b. The impact of population density and other factors on the effectiveness of evacuation.

(1027)

<u>(Page)</u>	<u>SPECIAL INQUIRY GROUP RECOMMENDATION</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
Part 3 (cont'd) (1027)	4. FEMA should be required to certify the status of State emergency planning prior to the issuance of an NRC license (G.2.f).	III.B.2	a
(1034)	1. NRC, in cooperation with FEMA and HEW, must establish criteria for the storage and distribution of a thyroid-blocking agent, such as potassium iodide. Specifically, consistent guidance needs to be developed for the use of potassium iodide in the total context of nuclear hazards. Prompt attention should be given to the population at risk in the vicinity of nuclear plants.	III.A.1.3	a
	2. The utility must fund the purchase and storage of potassium iodide, based on the same rationale that supports our recommendation to require utility funding of the development of local emergency plans.	III.A.1.3	b
	3. Each State must develop specific criteria and procedures governing the storage, distribution, and use of potassium iodide that are consistent with Federal guidance and stockage requirements.	III.A.1.3	b
	4. Unlike evacuation, which requires substantial time to implement, other protective actions should be strongly considered if radiation levels or doses are likely to approach protective action guides.	III.A.2.2	a
(1039)	1. DOE must be the lead agency for coordination and implementation of a prompt, large-scale emergency radiological monitoring response, since it is already operationally equipped for such a function. However, the EPA should be the lead agency for long-term, low-level, followup monitoring actions; and HEW should be the lead agency for determining the long-term health effects of the accident (G.4.a, G.4.b).	III.A.3.6(2)	b
	2. FEMA must assure that personnel dosimetry equipment capable of measuring and indicating both low and high radiation exposures is available for those involved in conducting evacuations and securing the evacuated areas, such as the State police, fire personnel, and the National Guard, and that training is provided in the use of this equipment.	III.A.3.6(2), III.B.1	b
	3. RAP and AMS/NEST teams must be promptly dispatched by DOE upon the occurrence of a potentially serious radiological incident without waiting for an invitation or request by the State or NRC.	III.A.3.1, III.A.3.6(2)	b

<u>(Page)</u>	<u>SPECIAL INQUIRY GROUP RECOMMENDATION</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
Part 3 (cont'd) (1039)	4. Radiological monitoring and radio relay positions must be preplanned by the utility in cooperation with the NRC, DOE, and the State and should be based on land use, terrain, accessibility, and other considerations.	III.A.2.3, III.D.2.4, III.D.2.6	b
(1043)	1. FEMA must carefully evaluate communications systems to determine if the preassigned authorities and responsibilities of the various Federal, State, and local agencies and the utility can be carried out effectively during an emergency situation.	III.B.2	b
(1044)	2. Necessary information regarding the status of the emergency must be transmitted routinely and consistently by all parties to all appropriate Federal, State, county, and local government agencies.	III.B.2, III.C.2	a
(1047)	1. The NRC must adopt a policy that requires reasonable offsite emergency planning, and such planning must consider emergency response to low probability accidents having offsite consequences greater than those analyzed as "credible" in the design review.	III.A.3.1	a
	2. The NRC must establish the areas for which evacuation planning is required and the maximum times within which evacuation of the areas must be conducted.	III.A.2.1, III.A.2.2, III.A.3.1	a
(1048)	3. Clear and explicit Federal and State emergency response coordination and command roles must be established and understood by all parties.	III.A.2.2, III.A.3.1, III.B (all sections)	a
	4. Appropriate emergency plans must be developed and routinely tested at all levels of government and suitably meshed with the utility's plan. These plans must include sufficient detail to facilitate a reasonably prompt and effective 10-mile evacuation. The utility should in some manner provide the funding appropriate for the development and testing of local emergency plans.	III.A.3.5	a
(1049)	5. Evacuation plans must be prepared in anticipation that the evacuation of selected persons will result in the voluntary evacuation of many more people than specified, and that many people living at least twice as far from the reactor as specified will also evacuate.	III.A.1.1, III.A.2.2, III.B.2	b
(1050)	6. The NRC, in cooperation with HEW and the EPA, must establish uniform and agreed upon protective action guides. The NRC must also develop criteria for the storage and distribution of potassium iodide so that it can be reasonably available to the public if needed.	III.A.1.3, III.A.3.1	a

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(cont'd)  
(1050)

7. A DOE Radiological Assistance Team must automatically be dispatched whenever there is a clearly abnormal radiological situation at a nuclear power plant; formal procedures to this effect must be instituted. DOE should be the lead agency with regard to the collection and assessment of radiological monitoring data in any multi-agency emergency response. Also, arrangements must be made for the ready availability near every nuclear power plant of appropriate radiation monitoring equipment for all emergency response personnel and for training of the emergency personnel in its use.

III.A.3.1,  
III.A.3.6(2)

b

8. FEMA must carefully evaluate communications linking all participants in emergency response systems to assure that the systems are adequate for emergency communications. Such an evaluation should consider the availability of backup systems, as appropriate, communications from alternate command posts, and the use of automated data transmission.

III.A.3.6(2), III.B.2

b

(1050)

9. All organizations involved in emergency response must assess their information needs to assure the effective and timely communication of all necessary information during an emergency.

III.A.1, III.A.3.6(2),  
III.B.2

b

89

(1074)

1. All utilities operating nuclear power plants should designate a place equipped to serve as a communications center in the event of an accident that requires extensive interface with the news media. Such a facility must be near the site (J.1.a).

III.A.1.2, III.C.2

a

2. A senior NRC official should be the principal spokesman at onsite or near-site press conferences during an accident at a nuclear plant. A utility spokesman should be present at such press conferences to provide any differing views or additional information the utility feels is necessary to keep the public properly informed. A cognizant State official should be present at these press conferences and should have sole jurisdiction for public information concerning evacuation and related planning (J.2.a, J.2.b).

III.A.3.1, III.C.2

b

3. Each utility that operates nuclear power plants should ensure that a member of its public relations staff has extensive experience in dealing with the local media and that the staff member has a detailed understanding of the operating and radiological aspects of the utility operating plants.

III.A.1.1

b

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Part 3  
(cont'd)  
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- | (Page) | <u>SPECIAL INQUIRY GROUP RECOMMENDATION</u>  | <u>RELATED TMI<br/>ACTION PLAN TASK</u> | <u>STATUS</u>                     |
|--------|--|---|-----------------------------------|
| 4.     | Each utility that operates nuclear power plants should prepare a standard briefing package for each plant which provides background information about the plant and which can be disseminated to the media as required. This briefing package should be approved by the NRC.   | III.A.1.1, III.C.1                      | b                                 |
| 5.     | The NRC should establish requirements that will ensure prompt notification of the news media when a nuclear facility experiences an event that could impact the public's health and safety.  | III.A.3.1, III.C.2                      | a                                 |
| 6.     | The NRC nuclear accident response teams should include at least two technical individuals, one with a background in health physics and the other in reactor design and operations. Another response team member should be designated to establish and maintain open channels of communication to offsite centers involved in media interface activities. | III.A.3.1, III.C.2                      | b                                 |
| 7.     | The NRC should choose and train members of the technical staff to serve as technical advisors to the media following any future nuclear accident.  | III.A.3.1, III.C.2                      | b                                 |
| 8.     | The NRC should develop a standard format for press releases to ensure inclusion of basic information concerning a nuclear accident.  | None                                    | c (disagree with standard format) |
| 9.     | The NRC should establish a clear policy of issuing prompt public announcements concerning nuclear accidents.   | III.C.2                                 | a                                 |
| 10.    | The NRC should take the lead in working with responsible State agencies to develop a public information program to educate the general public on nuclear power and its consequences.   | III.C.1                                 | a                                 |

COMPARISON OF RECOMMENDATIONS IN OFFICE OF NUCLEAR REACTOR REGULATION  
LESSONS LEARNED TASK FORCE REPORTS (NUREG-0578 AND NUREG-0585)  
WITH THE TMI ACTION PLAN (NUREG-0660)

Key:

Impact on TMI Action Plan

- a. Recommendation is adequately covered in the Action Plan.
- b. This recommendation (or some part thereof) may not be explicitly included in the Action Plan but it is intended that, when the action is undertaken by the lead office, this specific recommendation will be taken into consideration.
- c. The NRC staff or Commission does not agree with the recommendation or the recommendation is beyond the purview of the NRC. The Action Plan does not account for this recommendation.

TMI-2 LESSONS LEARNED SHORT-TERM RECOMMENDATIONS (NUREG-0578)

<u>NUREG-0578</u> <u>Section Number</u>	<u>Section Title</u>	<u>Related TMI</u> <u>Action Plan Task</u>	<u>Status</u>
2.1.1	Emergency power supply requirements for the pressurizer heaters, power-operated relief valves and block valves, and pressurizer level indicators in PWRs.	II.E.3.1, II.G.1	a
2.1.2	Performance testing for BWR and PWR relief and safety valves.	II.D.1, II.D.2	a
2.1.3.a	Direct indication of power-operated relief valve and safety valve position for PWRs and BWRs.	II.D.3	a
2.1.3.b	Instrumentation for detection of inadequate core cooling in PWRs and BWRs.	I.C.1, II.F.2	a
2.1.4	Containment isolation provisions for PWRs and BWRs.	II.E.4.2	a
2.1.5.a	Dedicated penetrations for external recombiners or post-accident purge systems.	II.E.4.1, II.B.8	a
2.1.5.b	Inerting BWR containments.	II.B.7, II.B.8	a
2.1.5.c	Capability to install hydrogen recombiner at each light water nuclear power plant.	II.E.4.1, II.B.8	a
2.1.6.a	Integrity of systems outside containment likely to contain radioactive materials (Engineered Safety Systems and Auxiliary Systems) for PWRs and BWRs.	III.D.1.1, II.B.8	a
2.1.6.b	Design review of plant shielding of spaces for post-accident operations.	II.B.2, II.B.8	a
2.1.7.a	Automatic initiation of the auxiliary feedwater system for PWRs.	II.E.1.2	a
2.1.7.b	Auxiliary feedwater flow indication to steam generators for PWRs.	II.E.1.2	a

TMI-2 LESSONS LEARNED SHORT-TERM RECOMMENDATIONS (NUREG-0578) (Continued)

<u>NUREG-0578 Section Number</u>	<u>Section Title</u>	<u>Related TMI Action Plan Task</u>	<u>Status</u>
2.1.8.a	Improved post-accident sampling capability.	II.B.3, II.B.8	a
2.1.8.b	Increased range of radiation monitors.	II.B.8, II.F.1, III.D.2.1	a
2.1.8.c	Improved in-plant iodine instrumentation.	II.B.8, III.D.3.3	a
2.1.9	Analysis of design and off-normal transients and accidents.	I.C.1	a
2.2.1.a	Shift supervisor's responsibilities.	I.A.1.2, I.C.3	a
2.2.1.b	Shift Technical Advisor.	I.A.1.1	a
2.2.1.c	Shift and relief turnover procedures.	I.C.2	a
2.2.2.a	Control room access.	I.C.4	a
2.2.2.b	Onsite Technical Support Center.	III.A.1.2, III.A.2.2	a
2.2.2.c	Onsite Operational Support Center.	III.A.1.2, II.A.2.2	a
2.2.3	Revised limiting conditions for operation of nuclear power plants based upon safety system availability.	I.B.1.3	b

TMI-2 LESSONS LEARNED LONG-TERM  
RECOMMENDATIONS (NUREG-0585)

NUREG-0585 <u>Section Number</u>	<u>Section Title and Excerpt of Recommendation</u>	<u>Related TMI Action Plan Task</u>	<u>Status</u>
1.	<u>Personnel Qualifications and Training.</u>		
1.1	<u>Utility Management Involvement.</u> The corporate management of each licensee should establish a definite presence and involvement in the selection, training, and qualification of operations personnel. To assure that this has been accomplished, the NRC should require, as part of the application for operator and senior operator licenses, that corporate management certify the competence and fitness of the applicants.	I.A.2.1, I.B.1.1	a
1.2	<u>Training Programs.</u> Each licensee should be required to review its training program for all operations personnel, including maintenance and technical personnel, and should justify the acceptability of training programs on the basis that these programs provide sufficient assurance that safety-related functions will be effectively carried out.  The training should include the use of the systems already installed at the plant to control or mitigate the consequences of accidents in which the core is severely damaged. This training would be an interim measure pending completion of the rulemaking to determine what design features should be required to mitigate these more severe accidents.	I.A.2.2, II.B.4	a
1.3	<u>In-Plant Drills.</u> Each licensee should be required to review its training program with respect to the conduct of in-plant drills. For tasks performed by shift operating personnel in response to off-normal or accident situations, licensees should assure that sufficient in-plant drills are conducted to enable personnel to maintain proficiency in those tasks.	I.A.2.5	a

TMI-2 LESSONS LEARNED LONG-TERM RECOMMENDATIONS (continued)

NUREG-0585  
Section Number

Section Title and Excerpt of Recommendation

Related TMI  
Action Plan Task

Status

1.4

Operator Licensing.

- |     |   |   |   |
|-----|---|---|---|
| (1) | As part of the IE inspector training program, NRR operator licensing personnel should provide information to IE inspectors on the operator licensing program and identify the types of information the IE inspectors should provide to assist NRR in making decisions with regard to the renewal of operator licenses.  | I.A.2.4   | a |
| (2) | The NRC staff should establish a mechanism whereby individuals committing operational errors are identified in LERs. Such a mechanism should include provisions for protection of the privacy of the individual.  | I.A.3.2   | a |
| (3) | As part of the training program for all licensed operators, a one-week course should be conducted by the NRR operator licensing personnel with assistance from other NRR technical personnel. The course would include safety analyses, probabilistic assessments, current safety issues and recent significant operating experience, and NRC and industry responsibilities for safety. | Not included - replaced by Task I.A.2:3 which provides increased NRC presence in licensee training programs |   |

TMI-2 LESSONS LEARNED LONG-TERM RECOMMENDATIONS (Continued)

NUREG-0585  
Section Number

Section Title and Excerpt of Recommendation

Related TMI  
Action Plan Task

Status

(4)

Prior to assuming initial assignment as shift supervisor or shift technical advisor and on a biennial basis thereafter, individuals should be interviewed by an interdisciplinary group of NRC staff.

Not included - replaced by Task I.A.2.3 & I.A.3.1 which provides for increased NRC presence in licensee training programs and increased scope of examination of licensed personnel. For shift technical advisors (I.A.1.1) - IE will review implementation

(5)

The NRR operator licensing personnel should sponsor an annual workshop for licensed operators to be attended by at least one representative of the licensed shift personnel at each unit.

I.A.2.6(4)

a

(6)

As a less prescriptive alternative to recommendation 6 of SECY 79-330E, that "Phase II, III, and IV cold training program instructors and all hot training program instructors that provide instruction in nuclear power plant operations hold senior operator licenses and be required to successfully participate in applicable requalification programs to maintain their instructor status" the following is considered acceptable: such instructors should hold or have previously held a senior reactor operator license on a comparable nuclear

I.A.2.3

a

TMI-2 LESSONS LEARNED LONG-TERM RECOMMENDATIONS (Continued)

NUREG-0585  
Section Number

Section Title and Excerpt of Recommendation

Related TMI  
Action Plan Task

Status

power plant and currently possess instructor certification from INPO, provided the INPO certification program has been examined and found acceptable by the NRC. Emphasis should be placed on an instructor's ability to instruct, in addition to his technical competence.

(7)

Consideration should be given to placing resident operator licensing examiners in each of the major geographical areas in which there is a concentration of training centers using nuclear power plant simulators.

I.A.3.2

a

1.5

NRC Staff Coordination. A coordinated long-term approach to the subject of qualifications of personnel must be developed. The NRC should increase the staff resources in this area, assure the hiring of needed professional disciplines to increase present staff capabilities, and designate responsibilities and organizational entities within the various offices.

V.11

b

1.6

Licensed Operator Qualifications. A program for raising the qualification requirements for shift supervisors and senior reactor operators should be established.

(1)

Shift supervisors should have at least a BS degree or equivalent training and experience in engineering or the related physical sciences, hold a senior reactor operator's license, and have served as a reactor operator for one year or senior reactor operator (SRO) for six months. It is also recommended that shift supervisor qualifications include leadership training and experience.

I.A.2.6(1),  
I.A.2.6(2)

a

TMI-2 LESSONS LEARNED LONG-TERM RECOMMENDATIONS (Continued)

NUREG-0585 Section Number	Section Title and Excerpt of Recommendation	Related TMI Action Plan Task	Status
(2)	SROs should have at least the same general technical educational and specific training in transient and accident response characteristics of nuclear power plants as recently articulated for the shift technical advisor. Additional recommendations for upgrading SRO qualifications are identified in SECY 79-330E.	I.A.2.6(1), I.A.2.6(2)	a
(3)	The NRC, perhaps in consultation with INPO, should examine the content of the basic fundamentals course (part of the operator training program) and establish definitive instructional requirements for the course.	I.A.2.6(6)	a
1.7	<u>Licensee Technical and Management Support.</u> The NRC staff review and evaluation of the management and technical resources available to utilities to handle unusual events or accidents should be completed, and regulatory guidance should be developed that covers the capabilities and role of technical and management personnel in the normal operation of the plant and during an emergency. The criteria should contain a requirement for periodic verification of the licensee's technical and management support capability throughout the operating life of the plant.	I.B.1.1	a
1.8	<u>Licensing of Additional Operating Personnel.</u> The staff should decide which plant personnel, other than reactor operators and senior reactor operators, should be licensed.	I.A.3.4, I.A.3.5	a

TMI-2 LESSONS LEARNED LONG-TERM RECOMMENDATIONS (Continued)

NUREG-0585 Section Number	Section Title and Excerpt of Recommendation	Related TMI Action Plan Task	Status
2.	<u>Staffing of Control Room.</u> The Commission's regulations should be revised to more clearly state staff requirements for minimum shift staffing of licensed reactor operators. In developing revisions to regulations, consideration should be given to requiring the presence in the control room of two reactor operators and one senior reactor operator at all times during normal operations. Provisions for tours of the plant by operators will probably need to be made if this staffing proposal is adopted.	I.A.1.3, I.A.1.4	a
3.	<u>Working Hours.</u> Each licensee should be required to review and revise the plant administrative procedures to assure that a sound policy is established covering working hours for reactor operators and senior reactor operators.	I.A.1.3, I.A.1.4	a
4.	<u>Emergency Procedures.</u> Emergency operating procedures for all nuclear power plants should be reviewed by the NRC. The review should be conducted by interdisciplinary groups comprised of IE inspectors and NRR technical reviewers knowledgeable in system design, accident analysis, operator training, theories of education and crisis management, human factors, and the underlying technical bases for licensing.	I.C.8, I.C.9	a
5.	<u>Verification of Correct Performance of Operating Activities.</u> A more effective system of verifying the correct performance of operating activities is needed to provide a means of reducing human errors and improving the quality of normal operations, thereby reducing the frequency of occurrence of situations that could result in or contribute to accidents. Such a verification system should include automatic system status monitoring and human verification of operations and maintenance activities independent of the people performing the activity.	I.C.6, I.D.3	a

TMI-2 LESSONS LEARNED LONG-TERM RECOMMENDATIONS (Continued)

NUREG-0585 Section Number	Section Title and Excerpt of Recommendation	Related TMI Action Plan Task	Status
6.	<u>Evaluation of Operating Experience.</u>		
6.1	<u>Nationwide Network.</u> An integrated NRC-utility program to evaluate operating experience should be established.	I.E.4	a
6.2	<u>Providing Information to the Operator.</u> Each licensee should be required to review its administrative procedures to assure that a mechanism exists through which lessons learned from operating experience (such as IE Bulletins, Circulars and Notices, and LERs) and from the licensee's own operating experience evaluation group are conveyed to the reactor operators and other affected operations personnel.	I.C.5	a
7.	<u>Man-Machine Interface.</u>		
7.1	<u>Control Room Reviews.</u> All licensees should be required to conduct a review of their control rooms in an effort to improve upon operator-process communications. The safety review should consider control room design and control room operational procedures, including emergency operating procedures.	I.D.1	a
7.2	<u>Plant Safety Status Display.</u> Each licensee should be required to define and adequately display in the control room a minimum set of plant parameters (in control terminology, a state vector) that defines the safety status of the nuclear power plant. The annotated set of plant parameters should be presented to the operator in real time by a reliable, single-failure-proof system located in the control room; the set of plant parameters should also be available in real time in the onsite technical support center.	I.D.2	a

TMI-2 LESSONS LEARNED LONG-TERM RECOMMENDATIONS (Continued)

NUREG-0585 Section Number	Section Title and Excerpt of Recommendation	Related TMI Action Plan Task	Status
7.3	<u>Disturbance Analysis System.</u> RES should establish a program to evaluate the safety effectiveness of designs of disturbance analysis systems. The program should consider the evaluation of all pertinent methodologies being used in disturbance analysis systems.	I.D.5	a
7.4	<u>Manual versus Automatic Operations.</u> RES should formulate a program to establish a technical basis for definitive licensing criteria for manual and automatic operations for systems which execute plant safety functions and safety-related functions.	I.A.4.2(1)	b
7.5	<u>Standard Control Room Design.</u> The work by the IEEE standards committee to define design requirements for the standard control room should be completed expeditiously. Upon completion of the standard, SD should evaluate the standard for its acceptability in the licensing process.	I.D.4	a
8.	<u>Reliability Assessments of Final Designs.</u> The staff should initiate a systematic assessment of the reliability of safety systems in operating units and in units in the late stages of construction using simplified fault and event tree analyses.	II.C.1, II.C.2	a
9.	<u>Review of Safety Classifications and Qualifications.</u> The owners of operating plants and all plants under construction should be required to evaluate the interaction of non-safety and safety-grade systems during normal operations, transients, and design basis accidents to assure that any interaction will not result in exceeding the acceptance criteria for any design basis event.	II.C.3, II.F.5	b

TMI-2 LESSONS LEARNED LONG-TERM RECOMMENDATIONS (continued)

NUREG-0585 Section Number	Section Title and Excerpt of Recommendation	Related TMI Action Plan Task	Status
10.	<u>Design Features for Core-Damage and Core-Melt Accidents.</u> The Commission should issue a notice of intent to conduct rulemaking to solicit comments on the issues and facts relating to the consideration of design features to mitigate accidents that would result in (a) core-melt and (b) severe core damage, but not substantial melting.	II.B.8, III.D.1.1	a
11.	<u>Safety Goal for Reactor Regulation.</u> The Commission should undertake with the staff the development and articulation of clear criteria to define the basic safety goal for nuclear power plant regulation. Definitive policy guidance should also be developed regarding the threshold for backfitting of new requirements to existing plants.	IV.E, V.1	a
12.	<u>Staff Review Objectives.</u> The approach, methods, and organization of the NRC staff in performing licensing reviews of nuclear power plants should be revised (eight specific objectives given in the recommendation).	IV.E, V.11	b
13.	<u>NRR Emergency Response Team.</u> An NRR Emergency Response Team should be established to be on immediate call in the event of emergencies. The team should be a multi-disciplinary group composed of designated NRR personnel knowledgeable in reactor systems, instrumentation and control, core physics, accident analysis, radiation control, and health physics.	III.A.3.1	b

COMPARISON OF RECOMMENDATIONS IN THE OFFICE OF INSPECTION AND ENFORCEMENT  
SPECIAL REVIEW GROUP (SRG) REPORT (NUREG-0616) WITH THE TMI ACTION PLAN (NUREG-0660)

Status of SRG recommendations in the Action Plan:

- a. Recommendation is adequately covered under actions in the referenced task, or when no Action Plan reference is given it is adequately covered under current IE policies, practices, or procedures.
- b. This recommendation (or some part thereof) may not be explicitly included in the Action Plan but it is intended that when the action is undertaken by the lead office, this specific recommendation by the SRG will be taken into consideration.
- c. The staff or Commission does not agree with recommendation or the recommendation is beyond the purview of the NRC; the Action Plan was not changed to account for this recommendation.
- d. This recommendation will be taken into consideration in ongoing IE work.

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
2.0 <u>Findings and Recommendations Regarding the IE Preventive Inspection Program</u>		
2.2.1 <u>Inspection Program Emphasis - Direct Observation</u>		
1. The Office of Inspection and Enforcement should take additional action to emphasize observation of work activities.	I.B.2.1	a
2. Action should be taken to ensure trained inspector access to licensee facilities with minimum delay.	None	a
3. For major outages the IE inspection program should be revised to require an IE/licensee management meeting to review outage accomplishments, major modifications, systems status, and other significant conditions before return to power.	I.B.2.1	a
4. The IE inspection program should be revised to incorporate provisions for review of major outage schedules as a basis of inspection planning.	I.B.2.1	b
5. The IE inspection program should place additional emphasis on outage control and require IE to observe a larger portion of plant modifications and changes. Team inspections by regional inspections during outages should complement the resident inspector's activities.	I.B.2.1	b

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
2.2.2 <u>Independent Assessment</u>		
An expansion of independent assessment with adequate planning, direction, management, and guidance should be undertaken. The correct ratio of IE to contractor resources should be established and procedures developed. A dedicated task group with actual power plant experience in diverse areas such as calibration, NDE, and HP should be created to oversee development of this program.	I.B.2.1, II.J.2.2, III.D.2.6	a
2.2.3 <u>Program Administration</u>		
1. Regional line level management should be more actively involved in the supervision of inspections at the site. This will involve consideration of what constitutes adequate supervision and what is the function of the Section Chief.	None	a
2. Project and resident inspectors should be required to perform a project status review periodically with inspections who have conducted inspections at the site to integrate findings and identify areas of common concern.	I.B.2.3, I.B.2.4	a
3. Resident inspectors assigned to sites which are in the preoperation and startup phases should be supplemented by a preoperational inspection team leader from the regional office. The team leader, who would also serve as a backup resident inspector, would plan and direct the preoperational inspection program from the regional office. Site coordination would be the responsibility of the resident.	IV.F.1	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
4. The current regional organization relative to the reactor inspection program should be reviewed to identify changes required to implement the resident program. The use of inspector resources (e.g. project, resident, specialist) should be examined with the goal of establishing as uniform regional organization as is practical.	None	d
5. A group of inspection specialists should develop specific IE inspection guidance to review licensee actions related to NUREG-0578.	None	d
6. An independent IE organization should periodically audit regional implementation of the IE inspection program, to verify consistency and conformance with established IE policy. This independent audit group should report directly to the Director, Office of Inspection and Enforcement.	None	a
2.2.4 <u>IE Review of Licensee Procedures</u>		
IE review of the technical adequacy of licensee procedures should be significantly improved. Step-by-step evaluation of adequacy including correlation with the as-built system should be done for important procedures. Inspection guidance should be issued regarding number (fraction) and type of procedures which should be given this depth of review. Inspector resources needed to accomplish the program should be obtained.	I.B.2.1, I.C	b

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
2.3 <u>Communications</u>		
2.3.1 <u>IE Interactions with the Office of Nuclear Reactor Regulation (NRR)</u>		
1. Joint IE/NRR review groups should be used to evaluate safety-related issues identified by IE.	I.E	a
2. IE and NRR should establish an ad hoc committee to define the mechanism for effecting the above recommendation. The committee should also examine the current systems for information exchange between the two offices and recommend changes for improvement.	I.E.2, IV.B	a
3. The IE/NRR interfacing should include more interaction between NRR Project Managers and reviewers and IE inspectors. An interoffice agreement on joint IE/NRR site reviews should be implemented.	I.B.2.3., I.B.2.4	a
2.3.2 <u>Handling of Differing Views Within IE</u>		
The SRG believes that procedures should be developed to provide for automatic rereview of field-identified safety issues which have been rejected within IE. Consideration should be given to having this rereview performed by a joint IE/NRR committee.	None	d

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
2.3.3 <u>IE-Licensee Interfaces</u>		
1. IE should reemphasize to licensees the importance of having the project manager or the station superintendent attend all IE inspection exit interviews.	None	d
2. Meetings between senior IE regional management and senior licensee corporate management should be held annually.	I.B.2.3	a
3. Improve inspector training on conducting exit interviews and other management meetings.	IV.D	b
2.4 <u>Qualification and Training</u>		
2.4.1 <u>Inspector Qualification and Training</u>		
1. Expand initial inspector training to include courses on basic health physics and emergency response.	IV.D	b
2. Define an acceptable level of plant-specific knowledge needed by an operations resident inspector and develop a guided self-study program to reach that goal within a specified period of time. Inspector progress should be audited by his supervisor.	IV.D	b

SRG Recommendations (continued)

RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP

RELATED TMI  
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3. In addition to technical training, resident inspectors should be given training appropriate to their unique role of representing the NRC onsite. Such topics as conduct of meetings with public and media representatives should be included. Methods for keeping the resident abreast of NRC policies, decisions, and announcements should be developed.
4. Give regional office training and annual refresher training in health physics, emergency response, and respiratory protection (including mask fitting, medical examination, and bioassay) to all inspectors, so that unescorted admittance be granted to licensee facilities with only short delay for site-specific orientation. Inspectors should be provided with credentials certifying receipt of training.
5. Give health physics inspectors training on radiation protection and radwaste inspection modules to improve consistency in interpretation of requirements. Schedule refresher training on pertinent technical subjects for health physics inspectors.
6. Develop special courses to train IE inspectors in the proper method of conducting an investigation.

III.C, IV.D

b

IV.D

b

IV.D

b

IV.D

b

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
2.4.2 <u>Licensee Training</u>		
1. The NRC should form a group with representatives from IE, NRR, and Office of Standards Development (OSD) which would be responsible to establish minimum competency standards for various categories of unlicensed plant and contractor personnel and to define correspondingly acceptable training and refresher programs. The group should consider the extent of radiation protection refresher training needed by the various groups. Exchange with industry and professional groups is encouraged.	I.A.3.4, I.A.2.6	a
2. The group should identify regulatory changes needed to make the standard enforceable. NRC licensing and/or recognition of certification by other cognizant groups should be considered.	I.A.3.4, I.A.2.6	a
3. The group should establish a program for continuing verification of competence of of unlicensed personnel through the IE inspection program.	I.A.3.4, I.A.2.2	a
4. Inspection guidance in the IE Manual should be amended to assure that the standards are met and that suitable training programs are implemented.	I.B.2.1, I.A.2.2, I.A.2.6	d

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
5. IE, with the assistance of NRR, should develop a program for continuing verification of licensed operator competence. The program should factor in the recommendations of the NRR Lessons Learned Task Force and should extend beyond training records verification to direct interaction with the operator. It should also include review of operator performance on the simulator in routine and abnormal situations. Qualification standards for the examiners/inspectors should be established.	I.A.2.1, I.A.2.6, I.A.3.1, I.A.3.2	a
6. The NRC should develop maximum work hour criteria and establish them as requirements through suitable changes to the regulations.	I.A.1.3, I.A.1.4, I.A.2.6	a
7. The feasibility of establishing some form of "ability to perform test" should be investigated.	I.A.2.2, I.A.2.6	b
2.5 <u>Administrative Controls</u>		
2.5.1 <u>Licensee Management</u>		
1. The IE inspection program should be modified to emphasize assessment of the effectiveness of licensee management control systems.	I.B.2.1	a
2. IE regional management should periodically review licensee inspection history for indications of management control weaknesses. Weaknesses identified should be resolved in appropriate meetings between licensee and IE management.	I.B.2.3	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3. IE regional management should participate more actively in exit and management meetings at licensee facilities to increase visibility of IE management and to strengthen the IE program.	I.B.2.3	a
4. IE studies of approaches to measuring licensee performance should be reevaluated and utilized to define and implement a licensee performance appraisal system.	I.B.2.3, I.B.2.4	a
2.5.2 <u>Quality Assurance</u>		
1. The QA program requirements for the preoperational and startup test phase should be reemphasized by NRR by revision of the Standard Review Plan.	I.F.2	b
2. The IE inspection program for the preoperational and startup test phase should be strengthened to require additional QA inspections.	I.B.2.1	b
3. The IE inspection program should include a provision for a licensee/IE management meeting to perform a final review of the operational QA program in relation to the total administrative control program just prior to facility operations.	I.B.2.1	b
4. IE should reemphasize the importance of the QA function and require a licensee QA representative to attend IE inspection exit interviews. IE inspectors should meet with licensee QA personnel during site inspections.	None	d

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
2.5.3 <u>Plant Maintenance</u>		
1. A survey of all operating plants should be conducted to determine the effectiveness of maintenance programs. As a minimum, the survey should identify:	None	d
a. Maintenance staffing characteristics such as number per shift, types of skills, and training of the staff.	-	-
b. Maintenance practices such as what types of maintenance can be performed on back shifts, the number of technicians involved, relationship to QA/QC, spare parts philosophy and inventory, and preventative maintenance.	-	-
c. Change management related to jumpers, temporary modifications, bypass, out-of-service equipment, and others.	-	-
2. Evaluate the need for more comprehensive reporting requirements with attention on failure analysis of failure equipment. This should be considered in relation to Licensee Event Report (LER) evaluation and the Nuclear Plant Reliability Data System (NPRDS) interface. (Section 2.7)	I.E.6	a
3. The SRG feels that requiring implementation of a preventative maintenance program at licensed facilities should be studied to determine if such a requirement should be universally imposed.	I.F.2	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
4. The IE inspection program should require and verify that the maintenance program be in effect and adequately staffed prior to operation of the plant.	None	d
5. Exapnd IE inspection efforts in the area of instrumentation calibration. Include portable equipment and accident response instrumentation.	I.B.2.1	b
2.5.4 <u>Independent Review and Audit</u>		
1. IE should evaluate the adequacy of the independent safety reviews at all operating plants. The review should be conducted by an independent audit group and should consider the competency of plant staff members to review proposed design changes and the interface between plant staff review, offsite review, and design groups.	I.B.1.1, I.B.1.2	a
2. The NRC resident inspectors should periodically attend the onsite review group meetings.	I.B.2.1	b
2.5.5 <u>Radiation Controls</u>		
1. Technical specifications should be amended to require a technical audit of radiation protection, chemistry, and radwaste management programs at a frequency not to exceed three years. The audit team should include persons meeting ANSI N18.1-1971, "Selection and Training of Nuclear Power Plant Personnel" (or successor standard), qualification for radiation protection manager and radiochemist.	III.D.3.1	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
2. A comprehensive review of health physics, chemistry, and radwaste management should be done by IE with NRR participation during the first year of plant operation. A similar review should be done at all operating plants.	None	d
3. Preoperational inspection guidance should be strengthened to require detailed review of all radwaste release procedures, release quantification procedures, installed monitor calibration procedures, and all procedures relating to in-plant exposure control.	I.B.2.1	b
4. IE regional management should review the current radiation protection and radwaste management inspection programs to identify plants where increased inspection frequency is needed. Inspector resources should be increased to support an augmented inspection program.	None	d

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
2.6 <u>Plant Design</u>		
2.6.1 <u>NRC Design Inputs</u>		
1. The definition of safety related and other related terms such as "essential," "safety grade," and "important to safety" that are utilized by NRC should be examined. Safety related should be defined to remove ambiguity and introduce specificity. These definitions should be considered in terms of the interrelation between 10 CFR 50, Appendix A, "General Design Criteria," and 10 CFR 50, Appendix B, "Quality Assurance Requirements for Nuclear Power Plants and Fuel Reprocessing Facilities." This task of integrating Appendix A and Appendix B will necessitate adopting a "graded" approach to quality assurance such that the "all or nothing" classification would be eliminated. QA would be applied to any given SSC only to the degree required by the classification assigned to the SSC. The SRG recommends that this be approached on a Task Force basis with IE, NRR, and Office of Standards Development (SD) participation.	I.F (all sections)	a
2. The "Codes and Standards Section," 10 CFR 50.55a, should be reviewed and updated to include applicable industry standards (American Concrete Institute, Institute of Electrical and Electronics Engineers, and others). This would transform some design criteria which are presently only commitments into regulatory requirements and would provide a solid base for more rigorous inspection.	IV.E.4	b

SRG Recommendations (continued)

RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP

RELATED TMI  
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| <p>3. The NRC should require licensees to report revisions to the SAR on a periodic basis. Significant change which affect safety should be reported when the proposed change is defined for NRR review. All changes should be promptly distributed to Regional Offices.</p>   | <p>None (final rule being published)</p>  |
| <p>4. IE should participate with NRR in determining the acceptability of proposed licensee alternatives to regulatory guides.</p>  | <p>None d</p>   |
| <p>5. An NRC task force should take immediate steps to identify installed radiation monitoring/ sampling systems as safety related and to establish acceptance criteria for them, considering TMI experience. Considerations should include state-of-the-art data handling, the need for additional data display outside the control room, and the need for requiring automatic grab sampling capability on release paths. Impose these criteria as requirements on licensees.</p> | <p>I.F (all sections, a<br/>II.B.3,<br/>III.A.1.2,<br/>III.D.2.1,<br/>III.D.3.3</p> |
| <p>6. IE inspection guidance for the monitoring systems should include acceptance criteria. The system and all related calibration and release procedures should be examined before an operating license (OL) is issued.</p>   | <p>None a</p>   |

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
2.6.2 <u>Design Control</u>		
1. (a) Interdisciplinary teams from IE and other NRC offices should perform frequent audits of licensee and licensee contractor design controls.	(a) None	d
(b) Architect-engineers and nuclear steam system suppliers should be brought under NRC regulatory authority.	(b) IV.A.1, II.J.1	a
2. The IE inspection program should be strengthened by including specific requirements to audit design changes in the field during construction and preoperational testing.	I.B.2.1, II.J.2.1	a
3. IE inspections should concentrate on a comparison of as-built conditions with design criteria and drawings.	II.J.2.1	a
2.6.3 <u>Design Verification</u>		
1. NRC should reevaluate the concept of shared systems between dual units. Systems shared between units should be subject to more in-depth design verification in the design phase, due to the probability of interaction.	II.C.3	a
2. Revise the construction inspection program to enlarge the sample of components reviewed for qualification. Consideration should be given to establishing an IE:HQ environmental qualification review group similar to the Seismic Qualification Review Group to perform reviews which would include components from all systems categories.	II.J.2	b

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3. Establish a data bank of qualification reports by report number, vendor, and component.	II.J.2	b
4. Revise the IE inspection program to include positive requirements and criteria for evaluating and determining acceptability of environmental qualification reports for components and systems and qualification of testing laboratories.	II.J.2	b
5. Initiate a study by IE and NRR to evaluate the need for a continuing program of testing at nuclear power plants to confirm that plant behavior later in plant life continues as expected.	II.C.4	a

2.7 Evaluation of Events at Nuclear Power Facilities

1. Develop guidance for the resident inspector to relay for further NRC analysis information about events not reported by the licensee.	None	a
2. A headquarters Support Group should be established or an existing technical group expanded to include specialists in such areas as instrumentation, core physics, mechanical and electrical engineering, and thermal-hydraulics. This group would work full time doing in-depth analyses of LERs and would select events for analysis by the Event Analysis Group described below. Expanded computer searches for related events could be done by this group.	I.E	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3. A standing headquarters-based Event Analysis Group should be established to analyze events at licensed facilities. This group should consist of technical representatives from IE, NRR, the NSSS vendors, and the A-Es.	I.E	a
2.8 <u>Enforcement</u>		
1. The enforcement program should be studied to: determine methods for increasing the effectiveness of enforcement actions or sanctions; improve the timeliness of communications and enforcement action transmittals to licensees; establish interfaces with licensees to assure licensee awareness of NRC concerns; and establish enforcement actions more directly correlated with the degree of safety concern.	IV.A	a
2. Enforcement policy should be reviewed with particular emphasis on IE:HQ and OELD interface to assure timely processing of escalated enforcement action.	IV.A.2	a
3. <u>Findings and Recommendations Regarding Emergency Preparedness and Response</u>		
3.2 <u>IE Mission</u>		
1. Achieve statutory recognition of IE to formalize its entire mission.	V.11	a
2. Publish a concise statement of the IE emergency response mission to include: ensuring the emergency preparedness of NRC and NRC licensees; providing direction and manpower following an accident involving NRC-licensed material; and ensuring the historical preservation of accident information for use in future prevention and response activities.	III.A.3.1	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3. Revise Manual Chapter 0502, "NRC Incident Response Program," to explicitly define IE's mission, particularly in the areas of onsite direction of NRC activities and providing assistance to the licensee.	III.A.3.1	a
3.3 <u>Organizational Functions and Responsibilities</u>		
3.3.1 <u>Assignment of Organizational Functions and Responsibilities</u>		
Once IE's emergency response mission is well stated (Section 3.2), its responsibility and resulting authority should be clearly assigned and distinguished from the responsibility and authority of other NRC offices and other agencies.	V.11	a
3.3.2 <u>Description of Organizational Functions and Responsibilities</u>		
IE should establish and maintain (via change notice system) a catalog describing organizational functions, responsibilities, and authorities of NRC and other Federal agency components, of State and smaller governmental agencies, and of medical, fire, police, and other emergency services in major cities and near licensed facilities.	None	d
3.3.3 <u>The Role of Inspection and Enforcement</u>		
Formally establish IE as the NRC component primarily responsible for NRC activities at accident sites. To the extent possible, predetermine a chain of command within and beyond IE to ensure proper direction of site activities and proper communication of site information.	III.A.3.1	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.3.4 <u>Regional Organization, Plans, and Procedures</u>		
To the extent possible, regional emergency response organizations, plans, and procedures should be identical. An Emergency Office position should be uniformly established in each region, as well as in headquarters, to ensure this.	III.A.3.1	b
3.3.5 <u>The Role of the IE Inspector</u>		
1. Revise IE Manual Chapter 1300 to identify typical response teams for various classes of emergencies and to indicate typical initial tasks, as in the examples below. Include guidance and decision criteria to allow the Regional Director to determine the appropriate team size and composition.	III.A.3.1	a
2. Advise licensees of the role of IE response teams. Arrange that such teams are granted immediate access to the site and/or control centers.	III.A.3.1	b
3. Revise IE Manual Chapter 1300 to provide for the use of regional inspectors from unaffected regions as part of the NRC Operations Center support staff and as backup support at the scene. These individuals could be used to augment existing staff in areas such as communications, data/status maintenance, and evaluation. On-scene needs from unaffected regions will depend on the scope and duration of the emergency.	III.A.3.1	b

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.4 <u>Organizational Interfaces</u>		
3.4.1 <u>Description of Organizational Interfaces</u>		
<p>In the catalog of organizational functions, responsibilities, and authorities recommended in Section 3.3.2, define the interfaces of NRC and other Federal agency components; State and smaller governmental agencies; and medical, fire, police; and other emergency services in major cities and near major licensee facilities. For convenience, cross reference this catalog by organizational name and areas of responsibility.</p>	None	d
3.4.2 <u>Interfaces Internal to IE</u>		
1. Revise IE Manual Chapter 1300 to be consistent with the IE organization and NRC Manual Chapter 0502. Provide additional details concerning individual responsibilities.	III.A.3.1	a
2. Clarify the emergency response role of the IE Regional Director. Specify a requirement for the Regional Director to go to the scene of any Site or General Emergency, as defined in Regulatory Guide 1.101.	III.A.3.1	a
3. Clarify "chain of command" relationships between the on-scene leader, the Regional Response Center, and the IRACT. (This may be needed if the IRACT Director, due to the type of accident, is from outside IE.)	III.A.3.1	a

SRG Recommendations (continued)

RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP

RELATED TMI  
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4. Clarify Regional Response Center functions, once the NRC Operations Center is fully manned and the IRACT is functioning. It would appear that at this point the Regional Response Center team should become engaged in peer review and in rendering communication assistance to outside agencies or the media. The command, control, and communications link should be directly between the IRACT and the Regional Director, whether in the regional office or at the scene. Revise IE Manual Chapter 1310, "Regional Office Incident Response Actions," appropriately.

III.A.3.1

a

3.4.3 Interfaces Internal to NRC

1. As the organization chartered to take the lead in NRC emergency preparedness, IE should provide guidance and training to all NRC offices regarding emergency response functions and responsibilities. This would include formalized training/briefings to the Commissioners and to EMT and IRACT members.

III.A.3.5

a

2. Identify key staff positions required to support IRACT for various types of emergencies.

III.A.3.1

a

3. Establish criteria and procedures for NRR and other NRC offices to provide assistance to IE at the emergency site.

III.A.3.1

a

SRG Recommendations (continued)

RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP

RELATED TMI  
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STATUS

4. Conduct drills annually, in conjunction with a licensee and regional drill, that would mobilize the entire headquarters incident response team. (See "Drills," Section 3.14.5.)
5. Revise NRC Manual Chapter 0502 to clarify the duties of various NRC offices regarding Items 1-4 above.

III.A.3.5

a

III.A.3.1

a

3.4.4 Interfaces External to NRC

1. Recommendations made by the Task Force on Emergency Planning should be acted upon by cognizant managers. Interagency issues should be quickly resolved.
2. Revise NRC Manual Chapter 0502 to provide guidance regarding coordination of the NRC emergency response actions with all outside agencies. (Current guidance pertains essentially to DOE and the FBI.)
3. (a) Take steps to ensure NRC acceptance as the lead agency for responding to nuclear emergencies.  
(b) Clarify jurisdictional boundaries between NRC and other State/Federal agencies.
4. Monitor development of the AIF emergency organization scheme for all licensees and incorporate into Regulatory Guide 1.101, if appropriate.

III.A.1.1,  
III.A.3.6

a

III.A.3.1

b

(a) III.A.3.6

a

(b) III.A.3.1,  
III.A.3.6

b

III.A.1.1,  
III.A.2.2

b

SRG Recommendations (continued)

RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP

RELATED TMI  
ACTION PLAN TASK

STATUS

3.5 Application of Regulations and License Conditions

Establish and announce a firm policy regarding the responsibility and authority of licensees to follow and the authority of licensees to violate regulations and license conditions during emergencies. Provide additional guidance, as necessary, for the benefit of licensees and IE inspectors.

None

d

3.6 IE Policy and Direction

3.6.1 Assistance vs. Regulation

Publish a statement of NRC policy regarding assisting licensees. The statement should identify conditions (e.g., licensee unavailable, undermanned, or overwhelmed) under which assistance might be warranted. The statement also should discuss the limits of providing advice, direction, and equipment.

III.A.3.1

b

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.6.2 <u>Takeover from Licensee</u>		
Referencing the statutory authority, publish a statement of NRC policy regarding takeover from licensees. The statement should identify conditions under which takeover might be warranted, such as:	III.A.3.1	b
<ul style="list-style-type: none"><li>• Licensee unavailable</li><li>• Licensee proposing to perform or performing actions which are not prudent or legal.</li><li>• Licensee understaffed or overwhelmed.</li><li>• Licensee uncooperative.</li></ul>		
3.6.3 <u>Independent Measurements</u>		
(a) Publish a statement of policy regarding postaccident, independent measurements. On the basis of this policy, establish a continuing program for uniformly training and equipping regional personnel to perform such measurements.	(a) III.D.2.6	a
(b) Establish a centrally located facility to provide these training and equipment services and to provide radiochemistry support to the regions during both normal and emergency operations.	(b) None	d

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.6.4 <u>Emergency Dose Limits for NRC Personnel</u>		
Publish in the NRC Manual statements of NRC policy regarding emergency dose limits and whether an employee has the right to refuse assignments, during both normal and emergency conditions, because of the potential for radiation exposure.	III.A.3.1	b
3.6.5 <u>Safety vs. Security</u>		
Publish a statement of NRC policy regarding the relative importance of controlling access to Part 50 and 70 facilities to satisfy Part 73 and of permitting access to such facilities to perform tasks essential to safety. Also, require that the topic be addressed in licensee contingency plans.	None	d
3.7 <u>Training and Qualification</u>		
3.7.1 <u>Licensee Personnel</u>		
1. Review Part 50 and 70 licensee training records and interview trainees to ensure adequate training and resultant qualifications in the various areas of emergency preparedness. Verify that personnel assigned meet or exceed the training requirements of ANSI N18.1 and/or other applicable guidance.	III.A.1.1	d

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
2. Review shift staffing procedures to ensure that all emergency team, emergency organization, and minimum shift crew training and qualifications are met when personnel are assigned or selected for a shift.	III.A.1.1, III.A.2.2	d
3. If the above have not been specifically inspected since March 1979, they should be inspected by March 1980.	None	d
4. Licensee personnel should be given additional training in plant operations under emergency conditions or when high contamination is present.	I.A.2.5	a
3.7.2 <u>IE Personnel</u>		
1. Establish an Office of Training, which would operate an NRC Training Center. Locate the NRC Training Center to take advantage of simulator facilities and existing reactor proximity; for example, near the TVA Training Center in Chattanooga, Tennessee. New IE personnel should attend appropriate Training Center courses, or receive certification of competence, before being allowed to conduct unescorted inspections or being assigned lead responsibility for a facility. Existing IE inspectors should be certified or should attend appropriate Training Center courses until certification is received. The Training Center should conduct for IE, as a minimum, courses dealing with the following: (Note: The SRG listed 1-½ pages of specific recommendations which are not included here.)	IV.D	b

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
2. Promptly establish training and certification programs to prepare reactor resident inspectors to be responsive in the event of an accident, as well as perform routine inspections. Certify both existing and new resident inspectors. (Note: The SRG listed 1-½ pages of specific recommendations which are not included here.)	IV.D	b
3. To provide for individual recognition and documentation, develop a program leading to a Senior Resident Inspector (SRI) certification, which requires the inspector to have site-specific knowledge adequate to assure facility comprehension and the ability to evaluate transients and accidents. This will require knowledge at a level adequate to direct licensee actions, if necessary.	IV.D	b
4. Expand training for IE supervisors and management to ensure that fundamentals in various disciplines and licensee operations are retained in order to ensure that supervision/management is prepared to direct NRC emergency activities. The following training is recommended: (Note: the SRG listed 4 specific recommendations which are not included here.)	IV.D	b
5. Review training needs for IE staff not directly involved in operating reactors to ensure staff readiness for emergencies. Several suggested training courses are: (Note: The SRG listed 6 specific recommendations which are not included here.)	IV.D	b

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
6. Consider offering training in emergency response to appropriate State and local agencies.	IV.D	b
7. Conduct emergency response training, as necessary, for other Offices and Divisions within NRC.	IV.D	b
3.7.3 <u>Other NRC Personnel</u>		
1. Establish an emergency response training program involving all levels of NRC employees. Periodically, brief the NRC Commissioners, EMT members, and IRACT members concerning emergency preparedness.	III.A.3.5	a
2. Office Directors should identify courses to be offered by the Office of Training for their staffs. This may include short courses for supervisors (similar to recommendation No. 4 in Section 3.7.2) or courses in a specific discipline or technical area.	IV.D	b
3. The Office of Training should develop a curriculum to meet the needs of other NRC offices.	IV.D	b

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.8 <u>Administrative Controls</u>		
3.8.1 <u>Licensee Controls</u>		
Ensure that licensee administrative controls do not intentionally delay or unnecessarily hamper IE personnel.	None	a
3.8.2 <u>NRC Controls</u>		
Establish and document policy regarding all administrative matters affecting IE's ability to function effectively and efficiently in response to an emergency. Provide services and supplies as necessary.	III.A.3.1	b
3.9 <u>Resources</u>		
3.9.1 <u>Licensee Instrumentation and Equipment</u>		
1. All Part 50 and 70 licensees should review existing emergency plans and implementing procedures to ensure that specified actions can be performed. This review should include but not be limited to an assessment of the following: (Note: The SRG listed 16 specific recommendations regarding availability and operability of radiation monitoring and other equipment.)	I.D.1, III.A.1.1, III.A.2.2	a

SRG Recommendations (continued)

RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP

RELATED TMI  
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2. The licensee's meteorological system should be supplied with dedicated power or backup emergency power. The windspeed indicators should be upgraded to allow measuring the highest expected wind speed.

III.A.2.2

a

3.9.2 Licensee Other Resources

Each Part 50 and 70 licensee's emergency plans and procedures should include the name, location, and number of individuals, companies, governmental agencies, and other utilities which could furnish either personnel or equipment in support of the licensee's emergency effort. This should include but not be limited to: (Note: The SRG listed 6 examples of support resources which are not repeated here.)

III.A.2.1

a

3.9.3 IE Instrumentation and Equipment

1. (a) Determine regional instrument and equipment needs and transportation methods. Purchase instruments, equipment, calibration sources, carrying cases, and other accessories, and provide specialized training regarding calibration and use.

III.D.2.6

a

- (b) Establish a full-time position at each region for the purpose of maintaining, calibrating, and transporting such instruments and equipment.

None

d

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
2. Procure a mobile whole body counter to be installed at one regional office, which would transport it to any accident site, as necessary.	III.D.2.6	a
3.9.4 <u>IE Other Resources</u>		
1. NRC and regional emergency response plans should include the name, location, and number of individuals, companies, and agencies that could furnish support. This should be site specific, where necessary, and should include but not be limited to: (Note: The SRG listed 7 specific examples of support resources.)	III.A.3.1	a
2. To the extent possible, ensure that NRC medical consultants will be willing to respond whenever and wherever needed and that they will not be encumbered by consulting arrangements with licensees or other organizations.	None	a
3.9.5 <u>NRC Operations Center and Regional Response Centers</u>		
1. Redesign and reconstruct the NRC Operations Center to support a major accident (Figure 3.9.5.2). As a minimum, the Operations Center should contain or be designed to the following criteria: (Note: The SRG report included diagrams and two pages of specific recommendations which are not repeated here.)	III.A.3.2	a

SRG Recommendations (continued)

RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP

RELATED TMI  
ACTION PLAN TASK

STATUS

2. Recognizing that recommendation 1, above, is essentially a "long term fix," the following items are recommended for a "short term fix" for the existing NRC Operations Center: (Note: The SRG listed 4 specific recommendations which are not repeated here.)
3. Provide each NRC regional office with a dedicated Regional Response Center room with, as a minimum, the following: (Note: The SRG listed 8 specific recommendations which are not repeated here.)
4. Provide emergency lighting and around-the-clock air conditioning for all regional and headquarters emergency response facilities.

III.A.3.2

a

III.A.3.2

a

III.A.3.2

a

3.10 Investigation

3.10.1 Present IE Policy on Conduct of Investigations

Place increased emphasis on completing the Investigation Manual chapter presently under development.

None

a

3.10.2 Investigator Authority

Promptly redelegate to appropriate inspectors and investigators the authority to administer oaths and affirmations following emergencies.

None

a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.10.3 <u>Interview Transcriptions</u>		
Retain professional transcription service to work with investigation teams at accident locations. Also, assign a permanent clerical staff to the teams to handle administrative and clerical functions.	None	d
3.10.4 <u>Qualification and Training</u>		
1. Prepare a formal training program within IE to familiarize the regional investigative staff with the peculiar needs of NRC.	IV.D	b
2. Consider the various training programs offered by outside agencies during the interim period of establishing an NRC program.	IV.D	b
3. Establish a training program to familiarize regional inspectors with investigative techniques and procedures.	IV.D	b
3.10.5 <u>Timeliness</u>		
1. Assign one or two investigators to the initial response team to observe and to protect the integrity of documentary evidence.	None	d

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
<p>2. Require that power reactor licensees install a video and sound recording system in every power reactor control room, to be activated in the event of a reactor or turbine trip. This system would record control room activities during the initial phases of an accident to assist NRC and licensee in reconstructing the facts of the accident.</p>	I.D.2, III.A.1.2	a
<p>3.10.6 <u>Legal Assistance</u></p>		
<p>Assign a member of ELD legal staff to each accident investigation team to provide such assistance as may be needed.</p>	None	d
<p>3.10.7 <u>Coordination with Other Agencies</u></p>		
<p>IE should provide guidance regarding the role of the investigator in the conduct of joint investigations with other agencies.</p>	None	d
<p>3.10.8 <u>Liaison with Other Investigative Agencies</u></p>		
<p>Encourage regional offices to develop and maintain liaison with outside investigative agencies (e.g., Federal Bureau of Investigation; Drug Enforcement Agency; Alcohol, Tobacco, and Firearms; Secret Service; Customs; and State Police Organizations).</p>	None	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.11 <u>Communication</u>		
3.11.1 <u>Licensee Management</u>		
Require all Part 50 and Part 70 licensees to review their emergency notification procedures and ensure that key management personnel are equipped with beeper units to enhance prompt communication in an emergency.	III.A.1.1	a
3.11.2 <u>Site Telephones</u>		
1. Expedite installation of the second dedicated telephone line to each major facility. Both dedicated telephone lines should contain sufficient flexibility to accommodate additional tie-ins, such as from an offsite "command center" or trailer complex.	III.A.3.3	a
2. Consider backup communication links to enhance reliability in the case of a Centrex interruption. For example, a radiotelephone link to the licensee's microwave communication system may be appropriate.	III.A.3.3	a
3. Establish contractual arrangements with telephone companies serving major facilities to ensure swift installation of telephone facilities necessary to support extensive communications following an accident.	None	d

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
<p>3.11.3 <u>Licensee Radios</u></p> <p>Require Part 50 and Part 70 licensees to review their emergency communication capabilities and to consider: (Note: The SRG listed 6 specific recommendations for alternate communications which are not repeated here.)</p>	III.A.1.1	a
<p>3.11.4 <u>Licensee Technical Support</u></p> <p>Require licensees to incorporate into their emergency procedures and to keep current the following:</p> <ul style="list-style-type: none"> <li>. Lists and telephone numbers of senior operating personnel at similar plants.</li> <li>. Lists and telephone numbers of steam system supplier, architect engineer, and other contractor personnel involved in design or construction of the facility. The licensee should be required to ensure that prompt technical support is available at all times.</li> </ul>	III.A.1.1, III.A.2.1	a
<p>3.11.5 <u>Licensee/NRC Interface</u></p> <p>During future accidents, both the NRC and the licensee should appoint a communications or information coordinator to accumulate and transmit data from field teams.</p>	III.A.3.1	b

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.11.6 <u>NRC Radios</u>		
1. Review current systems and procure at least ten portable radio transceivers, with repeater units, for each regional office. This equipment should be standardized and interchangeable among regions.	III.A.3.3	a
2. Equip each regional mobile laboratory (Section 3.14.3) with: 40-channel CB with high-gain antenna; NAWAS and law enforcement transceiver with antenna; and receiver/transmitter base station with antenna plus repeater for the NRC portable radio system.	III.A.3.3	a
3.11.7 <u>Resident Inspectors</u>		
1. Provide each resident inspector a "beeper," the beeper number to be kept by the regional office, the NRC Operations Center, and the licensee. If available, the beeper should be of the voice-message type. It is recognized that there will be times when the beeper is out of range or otherwise unavailable and that not all reactor locations have a local beeper service. The purpose of the beeper is to increase the probability that residents can be reached.	None	d
2. Provide each resident a four-wheel drive vehicle equipped with two-way radio to the facility and a mobile telephone.	None	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.11.8 <u>Support from Other Agencies</u>		
In lieu of actually purchasing a similar communication network and training personnel in its operation, NRC should accelerate present negotiations with outside agencies and establish formal agreements to ensure communications when needed.	III.A.3.3	a
3.11.9 <u>Support from Within the NRC</u>		
1. IE should assist Tel Com in assessing and evaluating communications available to NRC at potential emergency locations. Develop a Temporary Instruction to examine these areas during routine inspections. Technical instruction to the inspectors could be furnished by Tel Com personnel visiting the regions.	None	d
2. IE should arrange with Tel Com to furnish disaster and weather information to the Incident Response Action Coordination Team (IRACT) after an accident.	III.A.3.3	a
3. Tel Com should arrange Early Reporting Service teletype communication between Region V and the National Earthquake Information Service, Golden, Colorado.	None	d

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.11.10 <u>Equipment</u>		
1. Establish a task group of IE and other NRC personnel, including the Telecommunications Branch, to evaluate and determine the feasibility of such telemetry systems and alternatives.	III.A.3.4	a
2. Use the existing TERA system to store facility data for display in the NRC Operations Center complex.	III.A.3.4	a
3.12 <u>Documentation</u>		
3.12.1 <u>Licensee Documentation</u>		
1. Require licensees to maintain normal logs, if possible, throughout an accident.	III.A.2.2, III.A.2.1	a
2. As recommended in Section 3.10.5, power reactor licensees should install in every reactor control room a reactor or turbine trip actuated, videotape camera/recorder, and a multichannel voice recorder to capture conversations and instructions that otherwise might be lost.	I.D.2, III.A.1.2	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>		<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.	Licensees should consider the use of computerized storage systems to record, display, and analyze selected plant parameters. These systems should be powered by a vital power supply.	I.D.2, I.D.3	a
4.	Licensees should consider the installation of backup computer printout facilities to ensure that no records are lost in the event the printer fails or the paper runs out during an accident.	I.D.2	a
3.12.2	<u>NRC Documentation</u>		
	Evaluate and standardize IE's capability for recording information and provide adequate supplies of logs, forms, recording devices, and other needs. Train IE personnel in the general area of information recording and in specific techniques used by NRC and licensees at various sites.	None	a
3.13	<u>Licensee Emergency Preparedness</u>		
3.13.1	<u>10 CFR Part 50 and Regulatory Guide 1.101</u>		
1.	Amend 10 CFR 50.54, "Conditions of Licenses," to clarify that 10 CFR 50, Appendix E, is a license requirement.	III.A.2.1	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
<p>2. Amend 10 CFR 50.59, "Changes, Tests, and Experiments," 10 CFR 50.59(a)(2), which defines an "unreviewed safety question," to include the emergency plan, emergency plan implementing procedures, and emergency resources, equipment, and instrumentation.</p>	III.A.2.1	c (alternate actions)
<p>3. Form a committee representing Office of Standards Development, Office of Nuclear Reactor Regulation, and Office of Inspection and Enforcement to revise RG 1.101 to provide clear requirements and specific minimum acceptable criteria, including the following:</p> <ul style="list-style-type: none"> <li>· Minimum number and availability of emergency equipment and instruments.</li> <li>· Minimum number and availability of self-contained breathing apparatus and minimum breathing time.</li> <li>· Minimum number of licensee drills and drill acceptance criteria.</li> <li>· Maximum time allowed licensee until 100% accountability of personnel.</li> </ul>	III.A.2.1, III.A.2.2	a
<p>3.13.2 <u>Protective Action Guides</u></p>		
<p>Require NRC Part 50 licensees to immediately review their emergency plans and their applicable State Protective Action Guides to verify that action levels specified in the Protective Action Guides are incorporated into the emergency plan and implementing procedures.</p>	III.A.1.1	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.13.3 <u>Personnel Accountability and Access Control</u>		
Issue a Temporary Instruction requiring a comprehensive inspection of licensees' personnel accountability and access control programs by March 1980.	III.A.1.1	c (alternate actions)
3.13.4 <u>Reentry and Recovery</u>		
1. Require all licensees to review current reentry/recovery plans and procedures to ensure adequate planning, including, but not limited to: facility models, such as TMI; accident personnel control; adequately (conspicuously) labeled valves and pipes; photographs/drawings of plant area with valve and equipment locations; and high level sampling procedures.	None	d
2. IE and NRR should evaluate the need for the development of post-accident plant operations procedures. Required licensee procedures should be promulgated via a change to Regulatory Guide 1.33.	None	d
3.13.5 <u>Supplies and Equipment</u>		
1. Require that licensees review current emergency plans to ensure that procedures identify a responsible member of the emergency organization who will coordinate initial requests for supply and equipment assistance from offsite support groups.	III.A.1.1	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
<p>2. Require that licensees review emergency plans and available equipment for adequacy in the event of a major accident. Licensees should procure equipment, revise the emergency plan and procedures, initiate contractual support services, etc., as necessary.</p>	III.A.1.1	a
<p>3.13.6 <u>Response Organization</u></p>		
<p>1. Revise Regulatory Guide 1.101 to specifically reference support which may be received from other utilities or contractors.</p>	III.A.2.1, III.A.2.2	a
<p>2. Require all licensees to review their emergency organization to identify where special advisory groups and technical support will be incorporated. The review should include preplanning to identify similar facilities from which to obtain assistance. The licensees should ensure that their organization is consistent with their Technical Specifications and Emergency Plan.</p>	III.A.2.1, III.A.2.2	a
<p>3.13.7 <u>Drills</u></p>		
<p>1. Require all licensees to review facility training records for each individual functioning in a position described in the emergency plan. For each individual identified, the licensee training program should certify successful completion of formal training courses and examinations, and successful drill participation every two years.</p>	I.A.2.2	a

SRG Recommendations (continued)

RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP

RELATED TMI  
ACTION PLAN TASK

STATUS

2. Amend Regulatory Guide 1.101 to provide an Annex C containing several detailed scenarios acceptable to be used for drills.

III.A.2.2

a

3.13.8 Tests

1. Amend 10 CFR 50.54, "Conditions of Licenses," to state:

III.A.2.1,  
III.A.2.2

a

"The licensee shall maintain for the life of the facility an adequate state of emergency preparedness, as specified in Appendix E. A license may be revoked, suspended, or modified for failure of the licensee to maintain an adequate emergency preparedness capability. The Commission shall conduct tests, as necessary, to demonstrate compliance with this part." (The last sentence is consistent with Parts 30.53 and 70.56.)

2. Amend Regulatory Guide 1.101, Annex B, Section 2.3.5, "Tests and Drills," to include a third paragraph, as follows:

III.A.2.1,  
III.A.2.2

a

"Licensees shall establish a program for the conduct of tests of the emergency plan, implementing procedures, facilities, equipment, personnel, and other organizations. The test program function shall demonstrate adequate capability to implement all portions of the emergency plan, implementing procedures, facilities, equipment, personnel, and other organizations at least annually."

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
<p>3. Develop and publish criteria for determining when the licensee's test, as described in recommendation (2), above, is unacceptable. In addition, IE and NRR should jointly participate in the development of criteria, scenarios, and administration of the NRC test as identified in recommendation (1), above, upon licensee failure to conduct an adequate test or demonstrate unsatisfactory performance.</p>	<p>III.A.1.1, III.A.2.1, III.A.2.2</p>	<p>a</p>
<p>3.13.9 <u>Multiple Responsibilities</u></p>		
<p>Require all Part 50 and 70 licensees to review shift staffing, emergency training records, and the emergency plan team requirements to ensure that emergency responsibilities are clearly assigned to qualified individuals and that multiple assignments are avoided.</p>	<p>III.A.1.1, III.A.2.2</p>	<p>a</p>
<p>3.13.10 <u>Classification and Notification of Emergencies</u></p>		
<p>1. Require all Part 50 and 70 licensees to adopt Regulatory Guide 1.101 to ensure standardized criteria and action levels. Each licensee should identify plant-specific criteria to allow determination of the applicable threshold.</p>	<p>III.A.2.1, III.A.2.2</p>	<p>a</p>

SRG Recommendations (continued)

RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP

RELATED TMI  
ACTION PLAN TASK

STATUS

2. Require immediate notification via the NRC "hot line" telephone of all plant, site, or general emergencies. For these three classes, specific criteria for reactors should include at least: (Note: The SRG listed 15 specific examples of events that should require immediate notification.)
3. Publish similar criteria for immediate notification by other licensees equipped with NRC hotlines.
4. Revise IE Manual Chapter 1300 to reflect the five Regulatory Guide 1.101 severity level classifications.
5. Revise and standardize regional emergency plans to be consistent with IE Manual Chapter 1300 and Regulatory Guide 1.101.

None

a

None

a

III.A.3.1

a

III.A.3.1

b

3.13.11 Transportation

1. The SRG concurs and encourages IE participation in implementing the recommendations of NUREG-0535, "Review and Assessment of Packaging Requirements and Emergency Response to Transportation Accidents."

IV.C

a

SRG Recommendations (continued)

RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP

RELATED TMI  
ACTION PLAN TASK

STATUS

2. The NRC should improve liaison with the States to ensure that State and local police understand notifications required for transportation accidents involving licensed material. Toward this end, NRC could provide, for distribution to State and local law enforcement agencies, cards or stickers, or information booklets containing NRC Regional telephone numbers.

None

d

3.13.12 Licensed Operators in the Control Room

1. NRR should revise facility technical specifications for all single unit facilities (or multi-unit facilities with separate unit control rooms) to require the presence of two licensed operators in the control room at all times when the reactor is in Mode 1, 2, or 3.
2. NRR should evaluate multi-unit facility technical specifications to determine if additional control room operator requirements during operation in Mode 1, 2, or 3 are appropriate for facilities with shared (common) control rooms for the multiple units.
3. NRR should evaluate the need for requiring the shift supervisor (or an assistant shift supervisor) to remain in the control room area at all times when the reactor is in Mode 1, 2, or 3.

I.A.1.3, I.A.1.4,  
III.A.2.2

a

I.A.1.3, I.A.1.4

a

I.A.1.3, I.A.1.4

a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>		<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.14	<u>NRC Emergency Preparedness</u>		
3.14.1	<u>NRC Emergency Response Plan</u>		
	1. Form an ad hoc NRC Emergency Preparedness Committee representing Inspection and Enforcement, Nuclear Reactor Regulation, Nuclear Material Safety and Safeguards, Standards Development, Administration, Congressional Affairs, Public Affairs, and State Programs to revise the current IRP to include emergency plans and procedures for each participating NRC Office.	III.A.3.1	a
	2. Establish Inspection and Enforcement as the lead Office for coordinating and implementing the IRP revision.	III.A.3.1	a
	3. Establish the Director of Inspection and Enforcement, or alternate, as the Deputy Director of EMT.	III.A.3.1	a
	4. Designate an individual as IE Headquarters Emergency Officer to coordinate emergency response planning.	III.A.3.1	a
3.14.2	<u>Regional Emergency Response Plan</u>		
	1. Form an ad hoc committee of regional representatives to revise existing regional emergency plans into a standard plan by March 1980.	None	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
2. Designate in each region a senior emergency planning inspector as Regional Emergency Officer. He should have a collateral duty for maintaining the regional emergency plan, for coordinating emergency response planning between regions, and for conducting regional drills, as specified under Section 3.14.5.	None	a
3. Staff the regional offices sufficiently to ensure that all personnel are not in travel between home and office at one time.	None	a
3.14.3 <u>Regional Capabilities</u>		
1. Establish the following minimum capability in each region by mid-1980: (Note: The SRG listed a number of specific recommendations for equipment and resources for mobile and fixed laboratories, emergency monitoring kits, and response centers.)	III.D.2.6	a
2. Standardize equipment and instruments among regions to allow interchangeability and to ensure that support personnel responding from other regions are already trained and familiar with the equipment and instruments.	III.D.2.6	a
3. Provide inspectors respirator mask spectacle frames and glasses.	None	d
3.14.4 <u>IE Manual Chapter 1300 and NRC Manual Chapter 0502</u>		
Revise IE Manual Chapter 1300 and NRC Manual Chapter 0502 in conjunction with the committee assignments discussed in Sections 3.14.1 and 3.14.2. (Also, see Sections 3.2, 3.3, and 3.4.)	III.A.3.1	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.14.5 <u>Drills</u>		
1. Conduct the following drills: (Note: The SRG listed several examples of types of drills to be conducted by regional offices and two suggestions regarding how drills should be conducted.)	III.A.3.5	a
2. Assign each Regional Emergency Officer to observe and critique one drill in another region annually.	None	d
3.14.6 <u>Site Reference Books</u>		
In each Regional Response Center and at the NRC Operations Center, maintain site reference books for each power reactor, test/research reactor, and fuel facility.	None	a
3.14.7 <u>Personnel Resources Matrix</u>		
Develop a personnel resources matrix as an addition to the IE staff data maintained by XOMA. Ultimately, such a matrix may be appropriate on an agency-wide basis. Examples of data to be stored include: (Note: The SRG listed 7 specific examples.)	III.A.3.1	a

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
3.15 <u>Security</u>		
3.15.1 <u>Licensee Organization</u>		
Require all Part 50 and Part 70 licensees to assess their security organization's structure, manning, and training, from the viewpoint of ability to respond to major accidents. The review should also consider agreements with outside support agencies.	IV.C	b
3.15.2 <u>Licensee Plans and Procedures</u>		
Request NMSS to review licensee security contingency plans presently under consideration to ensure that security's functions under emergency conditions are properly defined. Areas of consideration should include emergency organization, personnel processing, searches, and patrols.	IV.C	b
3.15.3 <u>Access Controls</u>		
1. Require licensees to establish compensatory search plans and procedures for use following the loss of normal facilities.	III.A.1.1	b

SRG Recommendations (continued)

RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP

RELATED TMI  
ACTION PLAN TASK

STATUS

2. Require all Part 50 and Part 70 licensees to review their current badging system and establish procedures for processing and identifying response personnel in all categories. Licensees should consider an offsite location or staging area with an individual responsible for coordinating the processing operation.

III.A.1.1,  
IV.C

b

3. Require contractors, vendors, State agencies, and Federal agencies that would be involved in a site response to furnish licensees with current lists of authorized individuals who would normally respond.

III.A.1.1,  
IV.C

b

3.15.4 Safety vs. Security

Using inspection teams comprising regional RONS, FFMS, and Safeguards inspectors and Headquarters Safeguards personnel, inspect in detail the access control systems of every licensee required to comply with Part 73.55. Determine whether such systems unacceptably affect the licensee's ability to control or mitigate an accident.

None

d

3.15.5 Transportation of SNM

1. Train safeguards inspectors in emergency response techniques, including radiation protection. The Emergency Response Operations Course conducted by DOE in Nevada might partially accomplish such training.

IV.D

b

SRG Recommendations (continued)

<u>RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP</u>	<u>RELATED TMI ACTION PLAN TASK</u>	<u>STATUS</u>
2. Provide vehicles equipped for extended trips, hazardous weather conditions, and emergency response.	None	d
3. Furnish vehicles with both inter-vehicle and field communication equipment and with secure radio communication with NRC Operations Center.	None	d
4. Install a dedicated telephone line between the NRC Operations Center and Tri-State, the principal commercial carrier of SNM.	III.A.3.3	b
5. Consider arming the inspection teams, which could be involved in attempted diversion or sabotage of a shipment.	None	c (do not agree)
6. Clarify the role of NRC inspectors covering shipments of SNM and define the inspector's authority over the commercial transportation team.	None	d
3.15.6 <u>IE Inspection Program</u>		
Revise the security and emergency planning modules to include full examination of the security organization's responsibilities and capabilities during emergency conditions. Specific areas to be examined should include the security organization structure, personnel processing, site access control, outside assistance, and radiation protection. The module should also examine security personnel training programs in the above areas.	None	d

SRG Recommendations (continued)

RECOMMENDATIONS OF THE IE SPECIAL REVIEW GROUP

RELATED TMI  
ACTION PLAN TASK

STATUS

3.16

Adverse Effect of Accidents on Other IE Activities

1. Ensure that Bulletins, Circulars, Notices, and Temporary Instructions are accurate and explicit. (Note: The SRG give two examples which are not repeated here--licensees should review bulletins before issuance, and Temporary Instructions supporting a bulletin should be more explicit.)
2. Identify in advance modules for reduced or delayed inspection effort at unaffected facilities following an accident. Consider the following examples: (Note: The SRG listed 3 examples for reduced inspection frequency and 6 examples for frequencies that would be maintained.)
3. Be prepared to direct existing resident inspectors to assist in accident response or special post-accident inspection/investigation functions. Residents from a similar facility would be valuable response team members. Whenever possible, residents should be utilized such that a site is not left without a resident.

IV.B

b

I.B.2.1

b

None

a

COMPARISON OF THE TMI ACTION PLAN WITH THE REPORT TO THE AIF POLICY  
COMMITTEE ON FOLLOWUP TO THE THREE MILE ISLAND ACCIDENT BY THE  
WORKING GROUP ON ACTION PLAN PRIORITIES AND RESOURCES

Section <sup>(1)</sup>	Description	Implementation	Resources
I.A.1.3	<p><u>Shift Manning</u></p> <ul style="list-style-type: none"> <li>• AIF provided alternative scope statement based on unacceptable assumption (one of two existing ROs can be qualified and licensed as SRO without an increase in staffing)</li> <li>• Action Plan revised to clarify NRC requirements</li> </ul>	<ul style="list-style-type: none"> <li>• AIF indicated staffing and training could be completed by January 1982. AIF schedule may not take into account additional staffing required by NRC</li> <li>• For operating reactors implementation schedule in Action Plan consistent with AIF schedule. For operating license applicants this action must be completed prior to fuel loading</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF cost estimate not applicable due to incorrect assumption in its scope statement</li> <li>• Licensee cost, however, revised upward in Action Plan (\$400,000)</li> </ul>
I.A.2.1	<p><u>Immediate Upgrading of Operator and Supervisor Training and Qualifications</u></p> <ul style="list-style-type: none"> <li>• Scope reduced, upgraded education is long-term (see I.A.2.6.) AIF concern that turnover rate may increase will be considered</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation schedule revised to correspond to revised scope of task</li> </ul>	<ul style="list-style-type: none"> <li>• Resources revised in Action Plan correspond to the revised scope</li> </ul>
I.A.2.2	<p><u>Training and Qualification of Operations Personnel</u></p> <ul style="list-style-type: none"> <li>• AIF noted this was a worthwhile task which should be pursued jointly by the NRC and INPO, where INPO would perform a task analysis for those positions that are generally used industry wide. Each utility would perform analyses for unique positions.</li> <li>• Revised to recognize the proposed AIF option</li> </ul>	<ul style="list-style-type: none"> <li>• AIF schedule more optimistic than NRC schedule</li> <li>• No revision required</li> </ul>	<ul style="list-style-type: none"> <li>• Resources were not shown in the Action Plan, which was revised to indicate an estimate of \$50,000 per plant per year</li> <li>• NRC estimate consistent with AIF estimate for recurring cost</li> </ul>

(1) Section numbers are the same as in the AIF report (which is the same as Draft 2) except Table C-3 which were not numbered in AIF report and are listed here by numbers in final version of the Action Plan.

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
I.A.2.5	<p><u>Plant Drills</u></p> <ul style="list-style-type: none"> <li>• Descriptions are comparable</li> <li>• Revised to indicate that the task related to drills requiring plant maneuvers and the AIF concern that plant challenges would increase is a Decision Group D item</li> </ul>	<ul style="list-style-type: none"> <li>• AIF schedule based on early issuance of NRC requirement</li> <li>• Action Plan revised to indicate walk-thru drills begin July 1, 1981 vice January 1, 1981 to allow time for procedure development. Revised schedule consistent with AIF schedule allowing time for procedure development and delay in requirement issuance</li> <li>• Action Plan revised to indicate long-term program is a Decision Group D item</li> </ul>	<ul style="list-style-type: none"> <li>• Resources revised to be more specific. Consistent with AIF estimate for short-term program implementation</li> <li>• Revised to indicate long-term program is a Decision Group D item</li> </ul>
I.A.3.1	<p><u>Revised Scope and Criteria for Licensing Examinations</u></p> <ul style="list-style-type: none"> <li>• Descriptions are comparable</li> <li>• Informing utility management of exam results (Recommendation 14 of SECY 79-330E) added to task.</li> </ul>	<ul style="list-style-type: none"> <li>• AIF showed a longer implementation schedule</li> <li>• Action Plan revised to indicate this item is an NTOL requirement with respect to initial exams.</li> <li>• Implementation schedule revised to differentiate between initial exam requirement and renewal exam requirement</li> </ul>	<ul style="list-style-type: none"> <li>• Revised to quantify costs</li> <li>• Initial implementation costs comparable to AIF</li> <li>• Recurring costs lower than AIF figures (\$100K vs. \$180K for AIF as provided in text of AIF description)</li> </ul>
I.A.3.2	<p><u>Personnel Selection Process</u></p> <ul style="list-style-type: none"> <li>• Item deleted as a separate task in Action Plan. Item now included as part of I.A.2.1 and I.B.1.1</li> </ul>		
I.A.4.1	<p><u>Initial Simulator Improvement</u></p> <ul style="list-style-type: none"> <li>• Descriptions are comparable</li> <li>• No revision necessary</li> </ul>	<ul style="list-style-type: none"> <li>• AIF schedule not consistent with NRC schedule. AIF stretches out NRC study and implementation schedule</li> <li>• Schedule revised to recognize greater time required for simulator modifications</li> </ul>	<ul style="list-style-type: none"> <li>• Costs were comparable; however, AIF more definitive in costs</li> <li>• Revised to correspond to AIF estimates</li> </ul>

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
I.A.4.2	<u>Long-Term Training Simulator Upgrade</u> • Descriptions comparable • No revision necessary	• Revised to indicate it is not possible to provide schedule until long-term requirements were specified	• Revised to indicate resources were uncertain until long-term requirements were specified. A range was specified consistent with AIF comments.
I.B.1.1	<u>Organization and Management Long-Term Improvements</u> • Descriptions comparable • No revision necessary • Now also includes I.A.3.2, Personnel Selection Process and I.B.1.2, Safety Engineering Group	• AIF expresses concern on speed of implementation and its possible negative impact on safety. No change in implementation schedule made. NRC will proceed cautiously on implementation. Public comment will be requested in process of criteria development. Possible negative impact on safety will receive due consideration during implementation process	• AIF and NRC resource estimates were consistent • Resource estimates lowered to be consistent with changes anticipated in final criteria
I.B.1.2	<u>Safety Engineering Group</u> • Deleted as a separate line item. Now included in I.B.1.1 and new I.B.1.2. Evaluation of NTOL Organization and Management Improvements which is broadened in Action Plan to include NTOL requirement for evaluation of organization and management improvements of NTOL applicants • AIF indicates safety engineering group need not be located on site full time. This is not correct. Some functions, but not all can be done offsite. The onsite/offsite functions to be performed will be specified in the final criteria (See I.B.1.1)		

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
I.B.1.5	<u>Loss of Safety Function</u> • Item renumbered (now I.B.1.3) • Item revised to indicate licensee action dependent on Commission decision	• Revised to reflect licensee action dependent on Commission decision	• Revised to reflect resource estimate dependent on Commission decision
I.C.5	<u>Procedures for Feedback of Operating Experience to Plant Staff</u> • AIF combined item with its description of I.B.1.2 • No need to revise Action Plan	• Revised to provide for implementation by ORs by January 1, 1981, and by NTOL applicants prior to fuel load • Since AIF combined I.C.5 and I.B.1.2, schedules cannot be compared	• Since AIF combined I.C.5 and I.B.1.2, resources cannot be compared • No need to revise Action Plan
I.C.7	<u>NSSS Vendor Review of Procedures</u> • Descriptions comparable • No revision necessary	• Proposed AIF schedule does not recognize this item is applicable only to NTOL applicants • No revision necessary	• Revised upward • Consistent with AIF estimate
I.C.8	<u>Pilot Monitoring of Selected Emergency Procedures for Near-Term Operating License Applicants</u> • Descriptions are comparable • AIF indicates an alternative to full NRC review would be to have the NRC Resident Inspector review existing procedures. Such a method leaves out review of procedures by NRC technical branches • No revision required	• Revised to reflect item is an NTOL requirement • AIF indicated schedule varies with each plant - No revision necessary for AIF comment	• AIF estimate of about \$300,000 per plant too high. Most action is performed by NRC • Action Plan revised to indicate an estimate of \$50,000 per NTOL applicant

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
I.C.9	<u>Long-Term Plan for Procedure Upgrade</u> <ul style="list-style-type: none"> <li>• Description of task significantly changed</li> <li>• Item now indicates a plan will be developed to address subject of procedure upgrade</li> </ul>	<ul style="list-style-type: none"> <li>• Revised to indicate schedule will be established during development of NRC plan</li> </ul>	<ul style="list-style-type: none"> <li>• Revised to indicate resource estimates will be addressed during development of NRC plan</li> </ul>
I.D.1	<u>Control Room Design Reviews</u> <ul style="list-style-type: none"> <li>• AIF stresses short-term, long-term corrections</li> <li>• Action Plan includes implementation of short-term and long-term fixes</li> <li>• No need for revision</li> <li>• AIF indicates changes should be implemented gradually and cautiously in operating plants and in NTOL plants where operators have already been qualified so as to accommodate the operator relearning process to the additional human engineering. This is an appropriate comment and the Action Plan now recognizes this point</li> </ul>	<ul style="list-style-type: none"> <li>• NRC schedule estimate revised and now comparable to AIF estimate.</li> </ul>	<ul style="list-style-type: none"> <li>• NRC estimate revised upward (Range of 1 to 2 million and 4 my)</li> <li>• AIF estimated 1.7 million and 6 my in Attachment 3</li> <li>• No further revision necessary</li> </ul>
I.D.2	<u>Plant Safety Monitor Display Console</u> <ul style="list-style-type: none"> <li>• AIF provided considerable discussion of functional and design requirements</li> <li>• Action Plan is very general in its description</li> <li>• Criteria for console are still being established</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF schedule provides for installation in calendar year 1982</li> <li>• Action Plan calls for submittal of system design by January 1981 and implementation by January 1982</li> <li>• No need to revise Action Plan</li> </ul>	<ul style="list-style-type: none"> <li>• AIF estimated approximately 4 million dollars. AIF estimate appears to be too high</li> <li>• Action Plan resources revised upward (Range of 1 to 2 million dollars estimated)</li> </ul>

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
I.D.3	<u>Safety System Status Monitoring</u> • Description in Action Plan changed to reflect NRR will do a study of the need for such a system including AIF cautions.	• Action Plan changed to indicate no licensee action required pending results of NRC study	• Resources not now estimated in Action Plan due to change in item description
I.E.4	<u>Coordination of Licensee, Industry, and Regulatory Programs</u> • AIF proposed no alternate scope statement; however, the AIF comment indicated a potential misunderstanding of the objectives and actions associated with this item • Action Plan description has been expanded and clarified. The new description should resolve AIF comments	• AIF and NRC schedules appear to be consistent • No revision necessary	• AIF estimated cost of \$5K per plant while the NRC estimated the cost to be minimal • Revised to use AIF cost estimate
I.E.6	<u>Reporting Requirements</u> • AIF provided alternative scope statement • Description of task has been extensively modified in Action Plan • The expanded version should resolve AIF comments	• Implementation schedule no longer estimated due to change in task scope • Schedule will be established during course of task accomplishment	• Resources no longer estimated due to change in task scope • Resources will be estimated during course of task accomplishment
I.G	<u>Training During Low-Power Testing</u> • Now redesignated I.G.1, Training Requirements • Descriptions are comparable; however, AIF provided more detailed assumptions • Since this is a new requirement, NRR is developing criteria in conjunction with initial NTOL reviews	• AIF indicated schedule varied with each unit and it assumed one month duration • Action Plan indicates training be conducted prior to full-power operation • No further revision necessary	• AIF indicated cost of \$100,000 plus replacement power cost due to extended startup period • Action Plan revised to indicate costs of 2 my plus costs associated with delay due to extended startup period which is estimated to be one additional week

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
I.G (Continued)	<ul style="list-style-type: none"> <li>• Description revised to provide additional clarification on individual shift training</li> </ul>		
II.B.4	<u>Training - Degraded or Melted Cores</u> <ul style="list-style-type: none"> <li>• AIF recommended revised scope to clarify intended NRC and licensee action</li> <li>• Action Plan revised to include AIF suggestions</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF estimate for development of initial training program (1.2 MY per plant) more realistic than the annualized estimate</li> <li>• Resources revised to agree with AIF estimate</li> </ul>
II.B.7	<u>Hydrogen Control</u> <ul style="list-style-type: none"> <li>• AIF suggests study instead of proposed inerting requirements</li> <li>• Revised Action Plan refers to current Commission Paper which calls for continued analysis as part of longer term rulemaking.</li> </ul>	<ul style="list-style-type: none"> <li>• No licensee action now required, plan revised</li> </ul>	<ul style="list-style-type: none"> <li>• No licensee action now required, plan revised</li> </ul>
II.B.9	<u>Core Retention and Vented Containment Studies</u> <ul style="list-style-type: none"> <li>• AIF disagreed with scope to require licensee conceptual designs and recommend NRC studies</li> <li>• Deleted as separate line item and included conceptual designs and studies to be done by both industry and NRC as part of rulemaking consideration (II.B.8)</li> </ul>		
II.C.1.1	<u>IREP</u> <ul style="list-style-type: none"> <li>• Renumbered II.C.1</li> <li>• Descriptions comparable</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
II.C.1.3	<u>Reliability Engineering</u> • Renumbered II.C.4 • Description comparable • No need to revise	• AIF estimate was the same as NRC (1/81), which now has been delayed to FY82 or later	• AIF estimate (1.5 MY) to establish program low. NRC 10 MY estimate now revised. Both estimate 1 MY continuing cost
II.D.4.	<u>Automatic Block of PORV</u> • Deleted as a separate line item and included as part of II.K.3, Table C.3, Items 1 and 2 • AIF recommended further study prior to implementation • Requirement revised based on ACRS concerns, similar to AIF proposal	• See II.K.3	
II.E.1.1	<u>AFW System Evaluation</u> • No need to revise	• No need to revise	• No need to revise MY estimate per plant, for study, AIF agrees • AIF estimate of modification cost is included in revised plan
II.E.2.1	<u>Reliance on ECCS</u> • AIF recommended survey of ECCS experience not proposed means for reducing challenges • Action plan revised to agree with AIF	• AIF suggests 6 months to study plus time to resolve NRC comments • Action Plan revised to initiate task in FY82 or later	• AIF indicates about 0.3 MY per plant • Compared to NRC estimate of 1 MY • Plan revised to include AIF estimate
II.E.2.3	<u>Appendix K Uncertainties</u> • AIF did not disagree with scope, but considered activity to be of lower priority	• No need to revise	• AIF estimate of 0.1 MY and \$1 K per plant - too low

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
II.E.2.3 (continued)	<ul style="list-style-type: none"> <li>No need to revise</li> </ul>		<ul style="list-style-type: none"> <li>Plan revised to show 15 MY total for industry and \$1,000,000 based on 5 approved models being assessed</li> </ul>
II.E.4.3	<p><u>Containment Integrity Check</u></p> <ul style="list-style-type: none"> <li>AIF suggests revised scope to perform feasibility study and perform some demonstration tests prior to issuing final criteria</li> <li>Action Plan revised accordingly</li> </ul>	<ul style="list-style-type: none"> <li>Longer schedule based on study, design, install and test sequence</li> <li>Action Plan revised to call for study in FY82 or beyond</li> </ul>	<ul style="list-style-type: none"> <li>AIF estimates 0.5 MY per plant for study and possible \$400K cost per plant for implementation</li> <li>Action plan revised accordingly</li> </ul>
II.E.4.4	<p><u>Containment Purging</u></p> <ul style="list-style-type: none"> <li>AIF recommends study of radiological consequences for workers and public</li> <li>Such studies made more explicit in revision</li> </ul>	<ul style="list-style-type: none"> <li>AIF schedule only for study.</li> <li>No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>AIF agrees with MP estimate in Action Plan</li> <li>Revised plan includes AIF capital cost estimates</li> </ul>
II.F.3	<p><u>Regulatory Guide 1.97</u></p> <ul style="list-style-type: none"> <li>AIF concerned that requirements are too uncertain, instrument development may be required and efforts should be consistent with other activities, i.e., Technical Support Center, control room design, status monitor, and safety vector</li> <li>Implementation will take these concerns into account</li> <li>No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>AIF indicates 18-27 months to implement</li> <li>Action Plan calls for 6/82 implementation</li> </ul>	<ul style="list-style-type: none"> <li>AIF estimates of \$6M to \$20M per plant - too high</li> <li>Action Plan revised to include "up to \$6M" per plant</li> </ul>

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
II.J.3.1	<p><u>Organization for Design and Construction</u></p> <ul style="list-style-type: none"> <li>• AIF believes NSAC and INPO should be involved in studies with NRC and DOE. NRC should not evaluate need without industry input</li> <li>• Action Plan revised to include studies with NSAC and INPO, but NRC will issue criteria based on results of studies</li> </ul>	<ul style="list-style-type: none"> <li>• Included in I.B.1.1</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise, included in I.B.1.1</li> </ul>
II.K.1 (Table C-1)	<p><u>IE Bulletin</u></p> <ul style="list-style-type: none"> <li>• AIF agrees with all items, with the exception of RCS pump trip and use of anticipatory trip without further detailed analysis</li> <li>• II.K.3 (item C-3-5) revised to continue study of the need for this requirement prior to implementation. Anticipatory trip is being evaluated by B&amp;W and will be reviewed by NRC.</li> <li>• No need to revise II.K.1</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
II.K.3 <u>Table C-3</u> C-3-1 & C-3-2	<p><u>B&amp;O Task Force Recommendations</u></p> <ul style="list-style-type: none"> <li>• AIF recommended include in II.D.4</li> <li>• Revised to require study prior to implementation of automatic PORV isolation, as suggested by AIF (see II.D.4)</li> </ul>	<ul style="list-style-type: none"> <li>• Study to be completed by 1/1/81, and implemented 7/1/81, if needed</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-3	<ul style="list-style-type: none"> <li>• AIF suggests include in I.E.6, reporting requirements only</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
C-3-4	<ul style="list-style-type: none"> <li>• AIF - include in II.C.1</li> <li>• OL implementation is in II.C.1</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-5	<ul style="list-style-type: none"> <li>• AIF - study need for RCP trip</li> <li>• Agree, revised to study need for RCP trip and need for automatic trip (see II.K.1)</li> </ul>	<ul style="list-style-type: none"> <li>• Revised to require study by 1/81 and modify, if required by 1/82</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-6	<ul style="list-style-type: none"> <li>• AIF - additional work should be done on not-to-interfere basis since current requirements are generally adequate</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise, in I.C.1 and II.F.2, II.F.3</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-7	<ul style="list-style-type: none"> <li>• AIF - no comment</li> <li>• Covered by C-2-14</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-8	<ul style="list-style-type: none"> <li>• AIF - unit specific, should not be in Action Plan</li> <li>• Disagree, further study required by staff. Action Plan revised</li> </ul>	<ul style="list-style-type: none"> <li>• AIF - completed</li> <li>• Disagree, see description</li> <li>• OR/OL implementation not applicable, Plan revised</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-9	<ul style="list-style-type: none"> <li>• AIF - design specific, complete but no need to be in Action Plan</li> <li>• Disagree, no need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-10	<ul style="list-style-type: none"> <li>• AIF - design specific, complete but no need to be in Action Plan</li> <li>• Disagree, no need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
C-3-11	<ul style="list-style-type: none"> <li>• AIF - design specific, complete but no need to be in Action Plan</li> <li>• Disagree, no need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-12	<ul style="list-style-type: none"> <li>• AIF - agree, not high priority, affects only two plants</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-13	<ul style="list-style-type: none"> <li>• AIF - should be included in II.E.2.1</li> <li>• While longer term investigation of ECCS challenge in II.E.2.1 will consider this and other topics as well, specific HPCI and RCIC separation for GE plants should be implemented</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-14	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF - completed</li> <li>• Disagree, 1/1/81 completion</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-15	<ul style="list-style-type: none"> <li>• AIF - agrees with scope and need</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-16	<ul style="list-style-type: none"> <li>• AIF - should be included in II.D.2 and II.E.2.1</li> <li>• Disagree, these items NA, no need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-17	<ul style="list-style-type: none"> <li>• AIF - agrees</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-18	<ul style="list-style-type: none"> <li>• AIF - should be included in II.C.1</li> <li>• Disagree, will not be studied specifically in IREP, no need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
C-3-19	<ul style="list-style-type: none"> <li>• AIF - design specific, should not be in Action Plan</li> <li>• Disagree, no need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-20	<ul style="list-style-type: none"> <li>• AIF - design specific, should not be in Action Plan</li> <li>• Disagree, no need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-21	<ul style="list-style-type: none"> <li>• AIF - should be studied further before implementing specific fix</li> <li>• Licensee analysis will point out other approaches, if appropriate, prior to implementation</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• Final implementation not until 1/1/82, no need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-22	<ul style="list-style-type: none"> <li>• AIF - agrees with scope</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF - low priority</li> <li>• 1/1/81 verification and 1/1/82 modification consistent with priority.</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-23	<ul style="list-style-type: none"> <li>• AIF - current systems adequate</li> <li>• Licensee should confirm, no need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• Included in I.D.2</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-24	<ul style="list-style-type: none"> <li>• AIF - should be included in II.C.1</li> <li>• Disagree, will not be studied specifically in IREP</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-25	<ul style="list-style-type: none"> <li>• AIF - should be included in II.C.1</li> <li>• Disagree, will not be studied specifically in IREP</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
C-3-26	<ul style="list-style-type: none"> <li>• AIF - not required, covered by procedures</li> <li>• Will be studied in II.E.2.1, longer term review and implementation</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• Included in II.E.2.1</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-27	<ul style="list-style-type: none"> <li>• AIF - should be included in I.D.1</li> <li>• Disagree, no need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-28	<ul style="list-style-type: none"> <li>• AIF - should be included in II.C.1</li> <li>• Disagree, IREP will not study specifically</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-29 <sup>(2)</sup>	<ul style="list-style-type: none"> <li>• AIF - should be included in II.C.1</li> <li>• Agree, removed from II.K.3</li> </ul>	<ul style="list-style-type: none"> <li>• Removed from II.K.3</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-29	<ul style="list-style-type: none"> <li>• AIF - design specific, should be removed from Action Plan</li> <li>• Disagree, no need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-30	<ul style="list-style-type: none"> <li>• AIF agrees with scope</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF - small safety impact, should not divert resources</li> <li>• Agree, 1/1/82 requirement consistent with this</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>
C-3-31	<ul style="list-style-type: none"> <li>• AIF agrees with scope</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF - low priority</li> <li>• 1/1/83 implementation consistent with priority</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• NA</li> </ul>

(2) As numbered in Draft 3

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
C-3-32	<ul style="list-style-type: none"> <li>• AIF - confirmatory experiments desirable</li> <li>• Agree, matter under consideration in II.E.2.2 (research) and for a PWR startup</li> </ul>	<ul style="list-style-type: none"> <li>• Should be on not-to-interfere basis</li> <li>• Plan revised to reference II.E.2.2</li> </ul>	• NA
C-3-33	<ul style="list-style-type: none"> <li>• AIF - conduct study</li> <li>• Agree, included in II.C.1</li> <li>• No need to revise</li> </ul>	• No need to revise	• NA
C-3-34	<ul style="list-style-type: none"> <li>• AIF - staff action, not reviewed</li> <li>• Agree, covered in II.E.2.2</li> <li>• Draft to be revised</li> </ul>	• Revised to show II.E.2.2 staff action	• NA
C-3-35	<ul style="list-style-type: none"> <li>• AIF - agrees with scope</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF - licensee completed action</li> <li>• Agree, covered in I.C.1</li> </ul>	• NA
C-3-36	<ul style="list-style-type: none"> <li>• AIF - staff action, not reviewed</li> <li>• Agree, covered in I.C.1</li> <li>• Draft to be revised</li> </ul>	• Revised to show I.C.1 staff action	• NA
C-3-37	<ul style="list-style-type: none"> <li>• AIF - agrees with scope</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF - licensee completed action</li> <li>• Agree, covered in I.C.1</li> </ul>	• NA
C-3-38	<ul style="list-style-type: none"> <li>• AIF - agrees with scope</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF - licensee completed action</li> <li>• Agree, covered in I.C.1</li> </ul>	• NA
C-3-39	<ul style="list-style-type: none"> <li>• AIF - agrees with scope</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF - licensee completed action</li> <li>• Agree, covered in I.C.1</li> </ul>	• NA
C-3-40	<ul style="list-style-type: none"> <li>• AIF - agrees with scope</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF - licensee completed action</li> <li>• Agree, covered in C.2.16</li> </ul>	• NA

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
C-3-41	<ul style="list-style-type: none"> <li>• AIF - agrees with scope</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF - licensee completed action</li> <li>• Agree, covered in I.C.1</li> </ul>	• NA
C-3-42	<ul style="list-style-type: none"> <li>• AIF - agrees with scope</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF - licensee completed action</li> <li>• Agree, covered in I.C.1</li> </ul>	• NA
C-3-43	<ul style="list-style-type: none"> <li>• AIF - agrees with scope</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• Licensee action completed</li> <li>• Agree, included in C-2-15</li> </ul>	• NA
C-3-44	<ul style="list-style-type: none"> <li>• AIF - should be included in II.C.1</li> <li>• Disagree, licensee analysis desired and IREP will not review all anticipated transients</li> <li>• No need to revise</li> </ul>	• No need to revise	• NA
C-3-45	<ul style="list-style-type: none"> <li>• AIF - agrees with scope</li> <li>• No need to revise</li> </ul>	• No need to revise	• NA
C-3-46	<ul style="list-style-type: none"> <li>• AIF - not generally applicable to BWRs</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF - low priority</li> <li>• No need to revise</li> </ul>	• NA
C-3-47	<ul style="list-style-type: none"> <li>• AIF - agrees with scope</li> <li>• No need to revise</li> </ul>	• Included in I.C.1 and II.E.2.2	• NA
C-3-48	<ul style="list-style-type: none"> <li>• AIF - NRC should evaluate all action items before implementation</li> <li>• Disagree, but subsequent evaluation will be done in II.C.1 and II.C.2</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• Included in II.C.1 and II.C.2</li> <li>• No need to revise</li> </ul>	• NA
C-3-49	<ul style="list-style-type: none"> <li>• AIF - should be included in I.C.8</li> <li>• Agree, also in I.C.9, no need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• Included in I.C.8 and I.C.9</li> <li>• No need to revise</li> </ul>	• NA

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
C-3-50	<ul style="list-style-type: none"> <li>• AIF - should be included in I.C.7</li> <li>• Agree, also in I.C.9</li> <li>• No need to revise</li> </ul>	• No need to revise	• NA
C-3-51	<ul style="list-style-type: none"> <li>• AIF - should be included in I.C.9</li> <li>• Agree, no need to revise</li> </ul>	• No need to revise	• NA
C-3-52	<ul style="list-style-type: none"> <li>• AIF - should be included in I.C.2</li> <li>• Agree, also in I.B.1 and I.C.5</li> <li>• No need to revise</li> </ul>	• No need to revise	• NA
C-3-53	<ul style="list-style-type: none"> <li>• AIF - should be included in I.A.1.3</li> <li>• Agree, no need to revise</li> </ul>	• No need to revise	• NA
C-3-54	<ul style="list-style-type: none"> <li>• AIF - should be included in I.A.4</li> <li>• Agree, included in I.A.4.1</li> <li>• No need to revise</li> </ul>	• No need to revise	• NA
C-3-55	<ul style="list-style-type: none"> <li>• AIF - no comment</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• No need to revise, included in I.C.1, I.D.2, and I.D.3</li> </ul>	• NA
C-3-56	<ul style="list-style-type: none"> <li>• AIF - agrees with scope</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• AIF - completed</li> <li>• Included in I.A.2.6, I.A.3.1, and I.A.3.3</li> <li>• No need to revise</li> </ul>	• NA
C-3-57	<ul style="list-style-type: none"> <li>• AIF - revised operating procedures should cover requirement</li> <li>• Agree for OLs, I.C.1 is referenced</li> <li>• No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>• OL implementation included in I.C.1</li> </ul>	• NA
Other	<ul style="list-style-type: none"> <li>• AIF - auxiliary feedwater system items should be included in II.E.1</li> <li>• Agree, removed from II.K.3</li> </ul>	• Removed from II.K.3	• NA

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
III.A.1.3	<u>Potassium Iodide</u> <ul style="list-style-type: none"> <li>AIF description is equivalent.</li> </ul>	<ul style="list-style-type: none"> <li>AIF: February 1981 Action Plan: March 1981</li> <li>No need to revise</li> </ul>	<ul style="list-style-type: none"> <li>AIF estimate comparable to Action Plan</li> </ul>
III.A.3.3	<u>Communications</u> <ul style="list-style-type: none"> <li>AIF assumed the land-lines were to carry data, not simply voice communications, as described more clearly now in the Action Plan</li> </ul>	<ul style="list-style-type: none"> <li>AIF showed a longer implementation time, but this was based on wrong scope assumption</li> </ul>	<ul style="list-style-type: none"> <li>AIF estimate too high</li> <li>Reduced industry resources to zero</li> </ul>
III.D.1.2	<u>Improved Vent Gas Systems</u> <ul style="list-style-type: none"> <li>This task has now been combined in item III.D.1(1) Primary Coolant Sources Outside Containment which is a Decision Group C item</li> <li>AIF recommended this task also consider return vent gas collection lines to containment. Action Plan revised to include this option</li> </ul>	<ul style="list-style-type: none"> <li>Now a Decision Group C item (except for a small NTOL requirement whose completion date has passed). Therefore AIF comments are not applicable</li> </ul>	<ul style="list-style-type: none"> <li>Resources shown in Action Plan now clearly identify them as being "NTOL" resources only</li> </ul>
III.D.1.3	<u>Secondary Systems</u> <ul style="list-style-type: none"> <li>This task now combined in item III.D.1(1) Primary Coolant Sources Outside Containment without change</li> <li>AIF noted that scope was vague</li> <li>Action Plan revised to make this task a Decision Group "C" item (except for small NTOL requirement)</li> </ul>	<ul style="list-style-type: none"> <li>Now mostly a Decision Group C item</li> </ul>	<ul style="list-style-type: none"> <li>Resources shown in Action Plan now clearly identify them as being "NTOL" resources only</li> </ul>

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
III.D.1.5	<u>Auxiliary &amp; Radwaste Building Ventilation</u> • This task now combined in item III.D.1.3(3) Ventilation System and Radioiodine Criteria without change	• AIF noted that most backfit systems would not be operational until first half of 1982 • Action Plan calls for task to be initiated in FY82 or later	• AIF estimates and Action Plan estimates are now comparable
III.D.1.6	<u>Radioiodine Absorber Criteria</u> • This task now combined in III.D.1.3(3) Ventilation System and Radioiodine Criteria	• AIF noted schedule is unrealistic. Plan revised to indicate task to be initiated in FY82, or later	• AIF annual cost slightly lower, Capital costs higher • No need to revise
III.D.2.1	<u>Radiation Monitoring of Effluents</u> • AIF description is equivalent	• Scheduled implementation is comparable with dates now shown in Action Plan. Task will not be initiated until FY82, or later	• Action Plan costs are speculative but not grossly out of line with AIF estimates • Since scope of this item is a feasibility study, no need to revise.
III.D.2.3	<u>Liquid Pathway Radiological Control</u> • AIF description equivalent	• This task is now a Decision "C" item, so implementation is not applicable	• Resources to implement not in Action Plan
III.D.2.4	<u>Offsite Dose Measurements</u> • AIF description equivalent	• This task is now a Decision "C" item, so implementation is not applicable	• Resources to implement not in Action Plan
III.D.2.5	<u>Offsite Dose Computational Manual</u> • AIF description equivalent	• AIF showed March 81 • Action Plan now shows task to be initiated in FY82, or later	• AIF estimated about 0.2 MY per plant plus a \$5K capital cost (assumed to be expense of printing new procedures) which have been added to the Action Plan

TMI ACTION PLAN RESPONSE TO AIF COMMENTS (continued)

Section <sup>(1)</sup>	Description	Implementation	Resources
III.D.3.1	<u>Radiation Protection Plans</u> • AIF description equivalent	• AIF showed December 1980 • Action Plan now shows task to be initiated in FY82 or later	• AIF estimated 190 MY industry cost • Action Plan showed the equivalent of 61 MY which was probably too low. Action Plan revised to show equivalent of 123 MY (i.e., 1 MY per plant) plus \$5K per plant for printing.
III.D.3.2	<u>Health Physics Improvements</u> • AIF suggested that licensees should be able to become certified processors of personnel dosimeters, if they desire • Revised description includes this option	• This is now a Decision Group "D" item; Implementation schedules not applicable	• Resources not applicable
III.D.3.3	<u>Inplant Radiation Monitoring</u> • AIF description equivalent	• AIF assumed May 1982. • Action Plan now shows work on additional monitors to be initiated in FY82 or later	• AIF estimate four times higher than was in Action Plan, which has now been doubled
III.D.3.4	<u>Control Room Habitability</u> • AIF description equivalent	• AIF showed March 1982 • Action Plan now shows January 1983 • No need to revise	• AIF estimated about 2.5 MY per plant; Action Plan showed 0.3 MY per plant with a capital cost of \$35K per plant. (AIF showed capital cost ranging from \$0.4 to \$1.0M per plant. Action Plan revised to 2 MY and \$0.5M per plant
III.D.3.5	<u>Radiation Worker Exposure Data Base</u> • AIF expressed concern about legal constraints on obtaining non-radiological health data on workers • Action Plan description implicitly recognizes this problem	• Now a Decision Group D item; implementation not applicable	• Now a Decision Group D item; no resources shown in Action Plan

COMPARISON OF COMMISSION ACTION ON SECY 79-330E, "QUALIFICATIONS OF REACTOR OPERATORS,"  
WITH THE TMI ACTION PLAN (NUREG-0660)

Key:

Impact on TMI Action Plan

- a. Recommendation is adequate covered in the Action Plan.
- b. This recommendation (or some part thereof) may not be explicitly included in the Action Plan but it is intended that, when the action is undertaken by the lead office, this specific recommendation will be taken into consideration.
- c. The NRC staff or Commission does not agree with the recommendation or the recommendation is beyond the purview of the NRC. The Action Plan does not account for this recommendation.

COMPARISON OF COMMISSION ACTION ON SECY 79-330E, "QUALIFICATIONS OF REACTOR OPERATORS,"  
WITH THE TMI ACTION PLAN (NUREG-0660)

SECY 79-330E  
Recommendation

Subject

Related TMI  
Action Plan Task

Status

Experience Requirements for Senior Operator Applicants\*

1

Applicants for senior operator licenses shall have 4 years of responsible power plant experience. Responsible power plant experience should be that obtained as a control room operator (fossil or nuclear) or as a power plant staff engineer involved in the day-to-day activities of the facility, commencing with the final year of construction. A maximum of 2 years' power plant experience may be fulfilled by academic or related technical training, on a one-for-one time basis. Two years shall be nuclear power plant experience. At least 6 months of the nuclear power plant experience shall be at the plant for which the applicant seeks a license.

I.A.2.1(1)

a

Requirement for Applicants for Senior Operator Licenses to Have Experience as a Licensed Operator\*

2

Training programs shall be modified so that the training concentrates on the responsibilities and functions of the operator, rather than the senior operator. All individuals who satisfactorily complete this training program will be allowed to apply for an operator license, but must have at least one year of experience as a licensed operator before applying for a senior operator license.

I.A.2.1(1)

a

Requirement for License Applicants to Participate in Plant Shift Operation\*

3

Three-month continuous on-the-job training for operator applicants as an extra man on shift in the control room shall be required. Senior operator applicants shall be required to have three months' continuous on-the-job training as an extra man on shift in training.

I.A.2.1(2)

a

\*Precritical applicants will be required to meet unique qualifications designed to accommodate the fact that their facility has not yet been in operation.

COMPARISON OF COMMISSION ACTION ON SECY 79-330E (continued)

SECY 79-330E  
Recommendation

Subject

Related TMI  
 Action Plan Task

Status

Requirement that Simulators be used in  
 Training Programs

4

In addition to the presently approved training programs, all replacement applicants shall participate in simulator training programs, as applicable for their facility.

I.A.2.6(3)

a

Audits of Training Programs and Administration of  
 Certification Examinations

5

NRC will audit training programs more closely and administer all the certification examinations at the simulator training centers.

I.A.2.3

a

Eligibility Requirements for Instructors

6

Training center and facility instructors who teach systems, integrated responses, transient, and simulator courses shall demonstrate their competence to NRC by successful completion of a senior operator examination and shall be enrolled in appropriate requalification programs to assure they are cognizant of current operating history, problems, and changes to procedures and administrative limitations

I.A.2.3

a

Periodic Retraining and Recertification on a Simulator

7

In addition to the present operator requalification program requirements, all licensees shall participate in periodic retraining and recertification on a full scope simulator representative of their facility. The frequency of training should be on an annual basis. Exceptions may be made for licensees at old facilities whose facility features and operating characteristics are not similar to present facilities, providing suitable alternatives are substituted.

I.A.2.6(3)

a

COMPARISON OF COMMISSION ACTION ON SECY 79-330E (continued)

SECY 79-330E  
Recommendation

Subject

Related TMI  
Action Plan Task

Status

7 (cont'd)

Presently, individuals who have not been performing licensed duties for 4 months or longer are required to participate in an accelerated requalification program and receive our approval, prior to resuming licensed duties. In addition to the present requirements, these individuals shall be recertified on a full scope simulator, representative of his facility. Licensees at older facilities may be excepted, providing suitable alternatives are provided.

I.A.2.6(3)

a

Explicit Requirements Regarding Exercises to be  
Included in Simulator Training Programs

8

More explicit requirements regarding exercises to be included in simulator training program shall be established. These requirements should assure performance of exercises in a broad spectrum of normal and abnormal operations and response to transients and emergencies and shall include consideration of multiple failures, compound abnormalities, and imperfect initialization. The requirements should not be rigid so that the flexibility and spontaneity in training programs are precluded.

I.A.2.6(1),  
I.A.3.1

a

Administration of Annual Operator Requalification Examinations

9

NRC will administer and grade all the annual written examinations and administer all the oral evaluations associated with requalification programs.

I.A.2.6(3)

a

COMPARISON OF COMMISSION ACTION ON SECY 79-330E (continued)

SECY 79-330E  
Recommendation

Subject

Related TMI  
 Action Plan Task

Status

Scope of Written Examinations

10	The content of the existing written examination will be expanded to include more selective essay type questions on thermodynamics, hydraulics, fluid flow, and heat transfer. This will be done by creating new categories for the RO and SRO examinations as appropriate. Time limits will be imposed for completion of the written examinations. Further, the grade will be based on the answers completed, during the fixed amount of time. Unanswered questions will be graded as a zero.	I.A.3.1	a
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Examinations at a Nuclear Power Plant Simulator

11	Part of the oral/operating test will be administered using existing nuclear power plant simulators.	I.A.2.6(3), I.A.3.1	a
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Oral Testing Requirements for Senior Operators

12	Senior applicants who hold an operator's license shall take an oral test in addition to the senior portion of the written examination.	I.A.3.1	a
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Requirements of Grading Examinations

13	The passing grade for operator and senior operator written examinations shall be 80% overall and at least 70% in each category.	I.A.3.1	a
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Informing Facility Management of Results of Examinations

14	NRC will provide facility management with the detailed results of NRC initial examinations so that individuals may be immediately enrolled in the requalification programs.	I.A.3.1	a
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COMPARISON OF COMMISSION ACTION ON SECY 79-330E (continued)

SECY 79-330E  
Recommendation

Subject

Related TMI  
Action Plan Task

Status

Simulator Requirements

15

Requirements shall be established that ensure that simulators, in order to receive credit in operator training and licensing activities, have the capability to accommodate a sufficient number and variety of abnormal and emergency conditions.

I.A.4.1,  
I.A.4.2

a

Requirements for Examiners

16

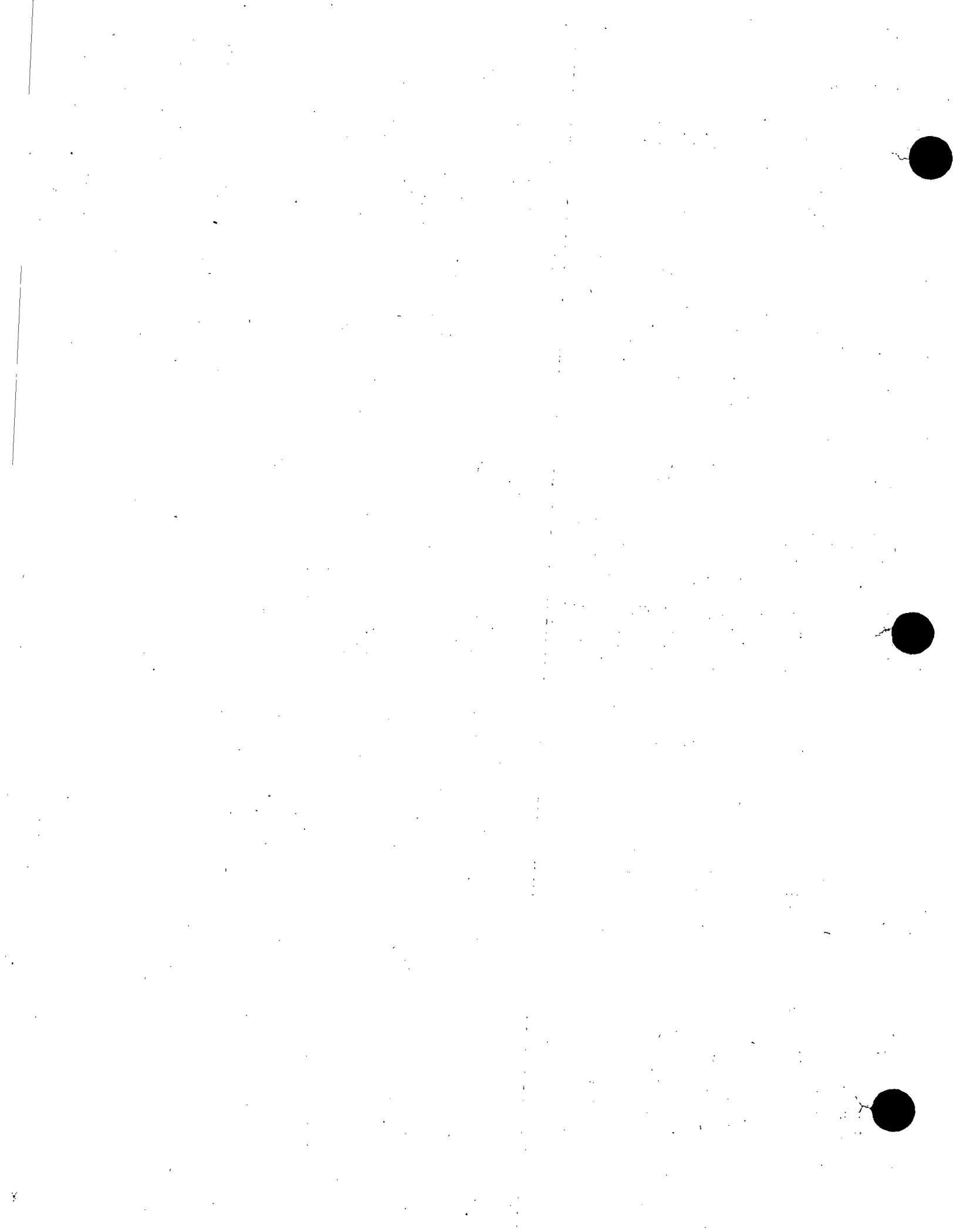
Formal training programs will be instituted for all examiners. A study of the staffing of the operator licensing program and the qualifications and training of examiners will be initiated. Subsequent to the study, the staff will report to the Commission and make recommendations as they deem appropriate.

I.A.3.2

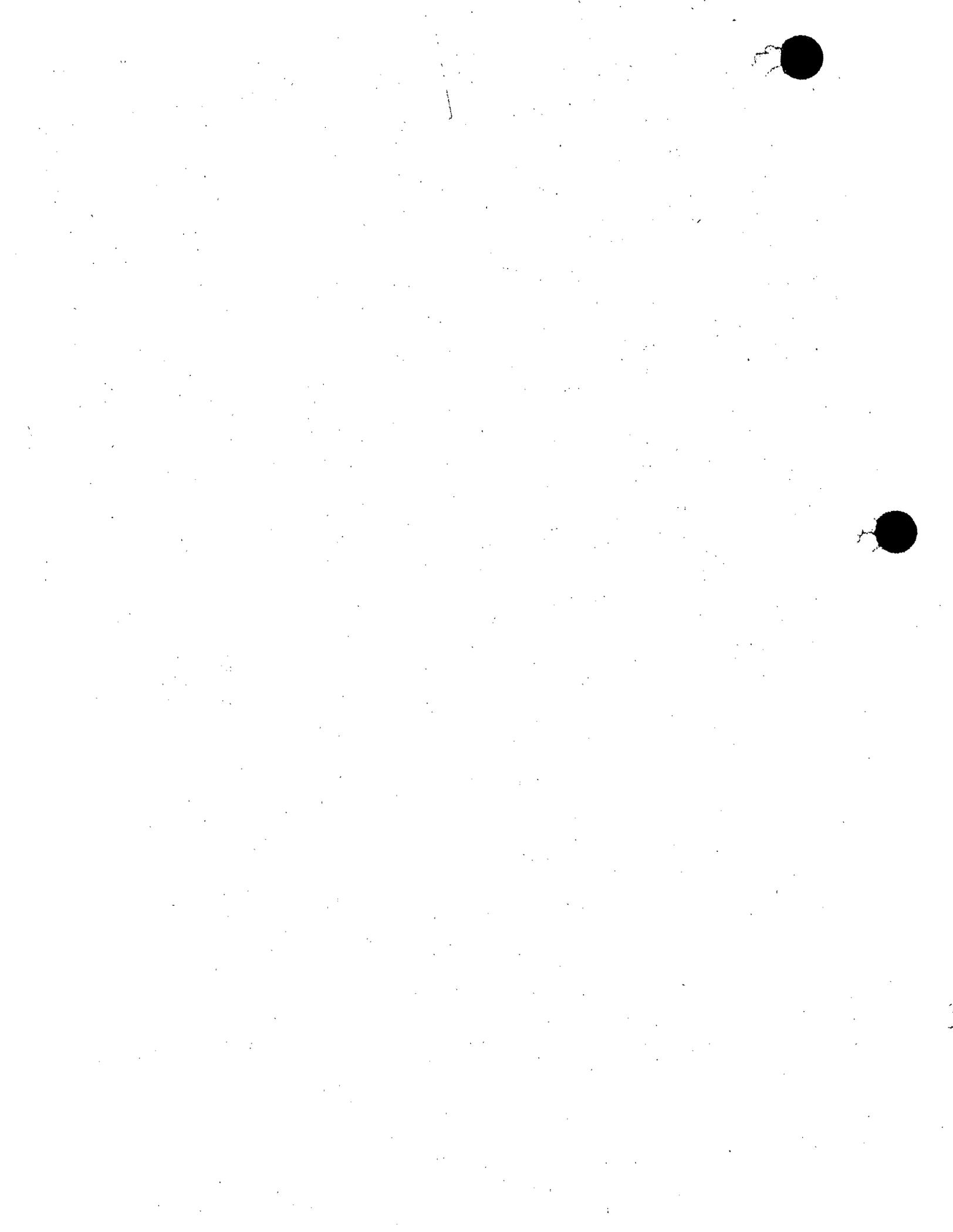
a



<b>NRC FORM 335</b> (7-77)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b> <b>BIBLIOGRAPHIC DATA SHEET</b>		1. REPORT NUMBER (Assigned by DDC) <b>NUREG-0660</b> <b>Vol. 1 and Vol. 2</b>	
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5. DATE REPORT COMPLETED MONTH: <b>May</b> YEAR: <b>1980</b>				6. (Leave blank)	
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