

127420

BY THE COMPTROLLER GENERAL

Report To The Congress

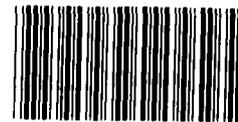
OF THE UNITED STATES

The Nuclear Regulatory Commission Should Report On Progress In Implementing Lessons Learned From The Three Mile Island Accident

Following the March 1979 accident at the Three Mile Island nuclear power plant, the Nuclear Regulatory Commission prepared an Action Plan consisting of 176 items that it believed were necessary to improve utilities' operations and NRC's regulation of nuclear plants. Responsibility for implementing the Plan was divided among utilities building and operating nuclear plants, the NRC staff, and the NRC commissioners.

Most of the Action Plan items were originally expected to be implemented by January 1983. GAO found, however, that some utility work on the Plan will not be completed until 1989 and NRC does not plan to complete those Action Plan items that it believes have relatively low safety significance.

GAO also found that NRC has not routinely disclosed Action Plan progress and has merged management of its remaining work on the Plan with other nuclear safety issues. For these reasons and the importance NRC once assigned to the Action Plan, GAO believes NRC should provide the Congress a one-time report that accounts for progress on the Action Plan, addresses the significance of incomplete work, and states how progress on the remaining work will be reported in the future.



127420



GAO/RCED-85-72
JULY 19, 1985

032585 / 127420

Request for copies of GAO reports should be sent to:

**U.S. General Accounting Office
Document Handling and Information
Services Facility
P.O. Box 6015
Gaithersburg, Md. 20877**

Telephone (202) 275-6241

The first five copies of individual reports are free of charge. Additional copies of bound audit reports are \$3.25 each. Additional copies of unbound report (i.e., letter reports) and most other publications are \$1.00 each. There will be a 25% discount on all orders for 100 or more copies mailed to a single address. Sales orders must be prepaid on a cash, check, or money order basis. Check should be made out to the "Superintendent of Documents".



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

B-213365

To the President of the Senate and
The Speaker of the House of Representatives

This report examines the progress made by utility companies that operate nuclear power plants and the Nuclear Regulatory Commission in implementing the May 1980 Three Mile Island Action Plan--a comprehensive list of items deemed necessary by the Commission to improve the operation and regulation of commercial nuclear facilities.

We conducted this review of the Action Plan because it represented a major regulatory initiative to incorporate a wide range of recommendations, made by various investigative organizations, into a plan for correcting the deficiencies highlighted by the accident.

Copies of this report are being sent to the Director, Office of Management and Budget, and to the Chairman, Nuclear Regulatory Commission.

A handwritten signature in black ink that reads "Charles A. Bowsher".

Charles A. Bowsher
Comptroller General
of the United States



D I G E S T

The accident at Three Mile Island in Pennsylvania on March 28, 1979, changed the complexion of the regulation and operation of nuclear power plants nationwide. A minor malfunction cascaded into a series of events that severely damaged the reactor and released traces of radioactive gases to the environment. The Congress, a Presidential commission, GAO, and the Nuclear Regulatory Commission (NRC)--the federal agency that regulates commercial nuclear power plants--all conducted accident investigations.

Subsequently, NRC's five Commissioners established a steering group to assess the many hundreds of recommendations made by accident investigators and develop a plan for implementing the recommendations. This assessment culminated in May 1980 with the Commission's approval and publication of the Three Mile Island Action Plan--a comprehensive list of 176 items that NRC judged necessary to improve utilities' operations and NRC's regulation of nuclear power plants.

Between September 1983 and June 1984, GAO assessed utilities' and NRC's progress in implementing the Action Plan. To make this assessment, GAO sent questionnaires covering each of the Action Plan items to the 65 power plants that were licensed to operate at the time of the accident and to NRC. GAO selectively verified information obtained from questionnaire responses, reviewed pertinent documents, and interviewed numerous officials of NRC, utilities, three nuclear power and utility industry groups, and one public interest group. GAO did not evaluate the technical adequacy of completed work on the Action Plan or address the public safety implications of delays in completing other work on the Plan. (See p. 4.)

On the basis of information obtained, GAO found that most of the work on the Action Plan has

been completed. GAO also found that NRC does not plan to complete low priority Action Plan work and utilities do not expect to finish their work on the Plan until December 1989.

Although having agreed to do so in response to an earlier GAO report,¹ NRC has provided the Congress with little information on Action Plan progress. NRC also no longer measures utilities' progress or its own progress against all the Action Plan requirements. Instead, NRC has consolidated management of Action Plan tasks with other, non-Three Mile Island-related safety issues.

STATUS OF THE ACTION PLAN

In the Action Plan, NRC set out estimated completion schedules for 104 of the 176 items. NRC estimated that 102 of these 104 items would be completed by January 1983. The other two items applied only to the two Three Mile Island plants. NRC also assigned a higher priority to items considered to have the greatest potential for improving safety in the shortest time and at the lowest cost.

The Action Plan assigned responsibility for implementing the 176 items in the Plan among utilities building and operating nuclear power plants, the NRC staff, and the NRC Commission. Subsequently, NRC divided the utility and NRC staff Action Plan items into 364 detailed tasks. Responsibility for Action Plan items and tasks is shown in the following table.

Action Plan Responsibility

| <u>Group</u> | <u>Items</u> | <u>Associated tasks</u> |
|---------------|--------------|-------------------------|
| Utilities | 39 | 142 |
| NRC staff | 120 | 222 |
| Commissioners | <u>17</u> | <u>-</u> |
| Total | <u>176</u> | <u>364</u> |

¹Do Nuclear Regulatory Commission Plans Adequately Address Regulatory Deficiencies Highlighted by the Three Mile Island Accident? (EMD-80-76, May 27, 1980).

Utility progress

NRC required each utility constructing or operating a nuclear power plant to implement all applicable tasks at their respective plants. Utilities building new plants were directed to do this work before receiving licenses to operate their plants, and utilities operating plants when the Three Mile Island accident occurred were required to implement applicable tasks at their plants according to schedules promulgated by NRC. Because of differences in plant designs, not all tasks applied to all plants. For example, at 51 operating plants where GAO obtained information, utilities were responsible for implementing from 70 to 96 of the 142 tasks.

GAO's analysis of the questionnaire responses and follow-up discussions showed that, with a 95-percent level of confidence, utilities have completed 84 percent of the Action Plan tasks at the 51 plants where GAO obtained information. These utilities expect to finish the remaining tasks by the end of 1989. Reviews of plant control room designs to identify and correct design deficiencies is an example of an incomplete utility task. (See p. 10.)

NRC staff progress

The items and detailed associated tasks assigned to the NRC staff involved performing research, conducting studies, and developing new regulatory requirements. The NRC staff has completed 122, or 55 percent, of the 222 individual tasks. Of the remaining 100 tasks, it is working on 69 and has suspended work on the other 31 because staff are not available or similar work is underway in other NRC programs. NRC does not now plan to complete 20 of the 31 suspended tasks because it considers them low in priority. (See p. 15.)

The NRC staff is taking longer than estimated to complete its work and is not following the priority system established in the Action Plan. For example, 37 completed tasks took an average of 13 months longer than originally scheduled, and NRC estimates that seven incomplete tasks will slip from 3 to 60 months, for an average delay of about 3 years. In

addition, 37 of the 100 incomplete tasks are assigned the highest priority, yet the NRC staff has completed 70 lower priority tasks. (See p. 16.)

Developing a regulation covering the fitness of nuclear power plant employees for duty is an example of a delayed high priority task assigned to the NRC staff. This task was originally scheduled to be completed by the end of 1982 but is still underway. (See p. 17.)

Commission progress

The 17 Action Plan items assigned to the NRC Commission pertained to NRC policy, organization, and management issues. The Commission has completed planned action on these 17 items. Five organization-related items were completed when the President reorganized NRC in 1980. The reorganization clarified the authorities and responsibilities of the NRC Chairman, the other four Commissioners, and the senior NRC staff officer. (See p. 19.) Eleven items varied from improving NRC's public hearing procedures on nuclear power plant license applications to finding a single location for the agency's headquarters staff. (See p. 20.)

In May 1984 NRC considered three parts of the remaining Commission item--studying the need for Three Mile Island-related legislation--incomplete. In commenting on this report, NRC said that it now considers this item complete on the basis of a recent study and experience gained since the accident. (See p. 25.)

NRC IS NOT ACCOUNTING FOR ACTION PLAN PROGRESS

The planned work on the Action Plan placed a heavy burden on NRC resources and relied extensively on the nuclear industry. To provide a mechanism for Congressional oversight, GAO recommended that NRC periodically report to the Congress on progress on each item in the Action Plan.² NRC agreed and suggested that its annual report to the Congress would be a suitable vehicle. In its 1980 annual report, NRC

²(EMD-80-76, May 27, 1980).

listed the status of each Action Plan item but did not discuss its plans for completing work on the Plan. Since then, however, NRC has included little information on the Action Plan in its annual reports. Its 1983 report, for example, acknowledged issuance of the Plan but provided no further details.

In December 1983 NRC merged the incomplete Action Plan tasks with generic issues³ derived from other sources into one management system. This was done to permit NRC to focus its work on the most important safety issues without regard to their origin. Consolidation of all safety issues is reasonable, in GAO's view, because it allows NRC to focus its work on the issues most important to safety regardless of how the issues were identified. According to NRC staff the new management system replaces the Action Plan as a current statement of the actions necessary to improve nuclear power plant operations and regulation.

CONCLUSIONS

The Three Mile Island accident generated widespread Congressional, state, local, and public attention and concern. In response to investigations of that accident, NRC prepared the Action Plan as a statement of necessary improvements in the operation and regulation of nuclear power plants. NRC originally estimated that most items in the Plan would be completed by January 1983. Since the accident, thousands of changes have been made at operating nuclear plants as a result of the Action Plan. However, utilities do not expect to complete work on the Plan until the end of 1989, NRC has not finished some of its work on the Plan and has decided not to complete other work considered low in priority, and many items assigned a high priority in the Plan are not yet finished.

³Generic issues are possible deficiencies in the design, construction, or operation of several or a class of nuclear power plants such that protection of the public or the environment may be inadequate.

Moreover, NRC has not routinely disclosed Action Plan progress to the Congress, has moved away from tracking the Action Plan, and has merged Action Plan tasks into a new generic safety-issues management system.

Therefore, GAO believes that NRC should publicly report on the accomplishments of the Action Plan to date and formally close out the Plan by showing if and how incomplete tasks will be pursued and reported on under the new management system.

RECOMMENDATION TO THE CHAIRMAN,
NUCLEAR REGULATORY COMMISSION

GAO is recommending that the Chairman, NRC, provide the Congress with a one-time, detailed report on the Action Plan that

- describes utilities' progress in implementing Three Mile Island-related changes at their nuclear power plants;
- describes the status and results of the Action Plan items that were the responsibility of the NRC staff and Commission; and
- addresses the significance of incomplete Action Plan items to public safety and shows how these items will be pursued, accounted for, and reported on under the new generic safety issues management system.

AGENCY COMMENTS AND
GAO'S EVALUATION

NRC limited its comments to factual corrections and suggested clarifications. The essence of its major comments is that (1) the number of Action Plan tasks discussed in the report disagrees with its current count of these tasks and (2) it is adequately tracking Action Plan progress and making information on the Action Plan publicly available. NRC also said that it plans to include a list of all generic safety issues, including those derived from the Action Plan, in its fiscal year 1984 annual report. (See app. I, p. 37 for NRC's detailed comments and GAO's evaluation.)

Differences between GAO's and NRC's counts of Action Plan tasks are the results of changes in the way NRC has subdivided and counted Action

Plan tasks at different points in time. GAO prepared its questionnaires and elicited information on the basis of NRC's subdivision of tasks as of September 1983. For this reason, GAO had to use that breakdown in preparing this report. NRC's current count of Action Plan tasks, prepared in December 1984, differs from other NRC counts made in September 1983, November 1983, and June 1984.

GAO agrees that NRC can track all of the specific tasks that have emanated from the Action Plan but notes that (1) this is becoming more difficult and cumbersome as NRC revises and expands its management control systems and (2) making the reports produced by these systems available to the public does not permit ready assessment of progress in implementing the Action Plan.

GAO also agrees that listing Action Plan-related issues in NRC's annual report is a useful step but continues to believe that a more detailed accounting for the Plan is needed. This accounting should include achievements to date, the status of those items that remain incomplete, expected completion dates, and reasons for major deviations from original schedules.



C o n t e n t s

| | <u>Page</u> |
|--|-------------|
| DIGEST | i |
| CHAPTER | |
| 1 INTRODUCTION | 1 |
| Objectives, scope, and methodology | 4 |
| 2 UTILITIES AND NRC IMPLEMENTATION OF THE ACTION PLAN | 10 |
| Utility implementation of the Action Plan | 10 |
| NRC staff implementation of the Action Plan | 15 |
| Commission implementation of the Action Plan | 19 |
| Summary of Action Plan implementation | 26 |
| Agency comments and our evaluation | 27 |
| 3 NRC SHOULD ACCOUNT FOR ACTION PLAN PROGRESS | 29 |
| NRC reports to the Congress have contained little information | 30 |
| NRC's measurement of utility progress is overstated | 31 |
| NRC merged management of Action Plan tasks with other safety issues | 32 |
| Conclusions | 33 |
| Recommendation to the Chairman, Nuclear Regulatory Commission | 34 |
| Agency comments and our evaluation | 35 |
| APPENDIX | |
| I Letter dated April 16, 1985, from William J. Dircks, Executive Director for Operations, Nuclear Regulatory Commission, commenting on this report | 37 |
| II Sampling methodology for utility actions | 52 |
| III Power plant questionnaire with summary of responses | 54 |
| IV Listing of utilities that received and completed GAO questionnaires | 68 |
| V Summary of utility responses to four questions | 71 |
| VI NRC questionnaire with summary of responses | 72 |
| VII Status and priority of the 39 Action Plan items approved for implementation by utilities | 86 |
| VIII List of incomplete high priority developmental items | 89 |

APPENDIX

Page

| | | |
|----|---|----|
| IX | Excerpts from the April 5, 1984, NRC Commission Briefing on the Status of Utility and NRC Compliance with the TMI Action Plan | 91 |
|----|---|----|

ILLUSTRATIONS

| | | |
|--|--|----|
| | Priorities and responsible implementing groups for the Action Plan items | 3 |
| | Comparison between complete and incomplete tasks by priority | 18 |
| | Completed Action Plan items | 26 |

ABBREVIATIONS

| | |
|-----|-------------------------------|
| GAO | General Accounting Office |
| NRC | Nuclear Regulatory Commission |
| TMI | Three Mile Island |

CHAPTER 1

INTRODUCTION

On the morning of March 28, 1979, the nation's worst commercial nuclear power plant accident occurred at Three Mile Island near Harrisburg, Pennsylvania. Starting with a minor malfunction in the nonnuclear part of the unit 2 plant, a series of events occurred that severely damaged the nuclear reactor fuel core and rendered the \$742 million plant inoperable. The seriousness of the accident raised nationwide concern about the safety of nuclear power.

The Three Mile Island accident was the catalyst for a major reexamination of both the operation and regulation of nuclear power in the United States. Within the Nuclear Regulatory Commission (NRC), which regulates the construction and operation of nuclear power plants, six staff-level task forces and offices investigated various aspects of the accident and the lessons to be learned and applied to nuclear regulation. The five NRC Commissioners also assembled a Special Inquiry Group, consisting primarily of NRC professional staff but headed by a legal firm, to independently investigate the accident. NRC's Advisory Committee on Reactor Safeguards¹ also conducted an inquiry into the accident.

Several other groups outside NRC also investigated the Three Mile Island accident. They include

- the Congress,
- the President's Commission on the Accident at Three Mile Island,
- the Governor of Pennsylvania's Commission on Three Mile Island, and
- the General Accounting Office (GAO).

Following the issuance of the President's Commission Report on the Accident at Three Mile Island, the NRC Commissioners established a steering group to assess and either adopt, modify, or reject the recommendations of that group and the other principal investigations of the accident. In carrying out its work, the steering group obtained comments from the NRC Commissioners, the Advisory Committee, and the nuclear industry. The product of this

¹The Advisory Committee on Reactor Safeguards is a statutorily created committee, consisting of 15 members, which advises the NRC Commissioners on nuclear regulatory matters.

work was the Three Mile Island Action Plan²--a comprehensive and integrated plan, approved by the NRC Commissioners in May 1980, for the actions that NRC judged necessary to improve the operation and regulation of nuclear power plants. In all, the Action Plan listed 176 items, including the following:

- Fifty-four items in the area of operational safety--
According to the Action Plan, a common conclusion of every investigation of the Three Mile Island accident was that, although many factors contributed to the accident, the major factor was the manner in which the plant was operated before and during the accident.
- Fifty-eight items on nuclear plant design and site selection--The accident demonstrated the importance of power plant system reliability. Therefore, the Action Plan contains requirements to assess accident probabilities and consequences, the reliability of plant safety systems and components, and siting requirements to reestablish distance between population centers and nuclear plants as a safety feature.
- Thirty items concerning emergency preparations in case radiation is released from a plant--According to the Action Plan, investigators of the Three Mile Island accident generally agreed that planning and preparedness for nuclear emergencies were inadequate at the time of the accident. They concluded that the inadequacies occurred, in part, because emergency planning had a low priority within NRC.
- Seventeen items on improving NRC's practices and procedures for issuing regulations and identifying safety issues.
- Seventeen items addressing NRC's overall policies, organization, and management--These items were considered necessary, according to the Action Plan, because accident investigators concluded that NRC had not articulated a substantive safety standard or policy underlying its regulatory decisions and that NRC's existing organization and management were inadequate to protect the public's health and safety.

One part of preparing the Action Plan was assigning relative priorities to the 176 items included in the plan. NRC established a priority system intended to assign higher priority to items that it decided were important to safety, could be implemented quickly, and required relatively few NRC and nuclear industry resources. According to the Action Plan, the NRC system ". . . was designed to give highest weight to the tasks with

²NRC Action Plan Developed as a Result of the TMI-2 Accident (NUREG-0660), U.S. Nuclear Regulatory Commission, May 1980.

greatest potential for improved safety in the shortest time at lowest cost to industry and government. The dominant weighting factor was safety significance." In addition, the Action Plan stated that high priority items should be completed as planned while the start of work on lower priority items could be delayed for 1 or 2 years. NRC believed this strategy would permit available resources to be used for many actions instead of a few costly and time-consuming ones. NRC assigned priorities to 133 of the 176 Action Plan items. It did not assign a priority to 43 items to be completed as a part of the agency's routine operations.

In a previous report³ on our evaluation of NRC's preparation of the Action Plan, we stated that this priority system seemed adequate for its intended purpose and that both the NRC Advisory Committee and the Atomic Industrial Forum⁴ had found the system acceptable.

The Action Plan also assigned estimated completion dates and resource requirements for 104 of the 133 priority items. The schedules in the Action Plan show that 102 of these items were to have been completed by January 1983. The two additional items, which were related to monitoring and evaluating Three Mile Island plant cleanup activities, were to have been completed by December 1984. The Action Plan did not assign completion schedules to the remaining 72 items.

The Plan also assigned responsibility for carrying out the Action Plan to three groups--utilities operating nuclear power plants, the NRC staff, and the NRC commissioners. The following table shows the distribution of the Action Plan items by their assigned priorities. Priority 1 is the highest priority.

Priorities and Responsible Implementing Groups
for the Action Plan Items

| <u>Item priority</u> | <u>Responsible group</u> | | | <u>Total</u> |
|----------------------|--------------------------|------------------|--------------------------|--------------|
| | <u>Nuclear utilities</u> | <u>NRC staff</u> | <u>NRC Commissioners</u> | |
| 1 | 27 | 27 | - | 54 |
| 2 | 9 | 39 | - | 48 |
| 3 | 3 | 28 | - | 31 |
| No priority assigned | - | 26 | 17 | 43 |
| Total | <u>39</u> | <u>120</u> | <u>17</u> | <u>176</u> |

³Do Nuclear Regulatory Commission Plans Adequately Address Regulatory Deficiencies Highlighted by the Three Mile Island Accident? (EMD-80-76, May 27, 1980).

⁴The Atomic Industrial Forum is an organization of utility and nuclear industry companies formed for the purpose of fostering the development and utilization of atomic energy for peaceful purposes.

Each nuclear power plant, operating and under construction, was to implement the utility items. The NRC staff was assigned responsibility for those items that required development of additional technical information and/or regulatory requirements before NRC could require changes at nuclear power plants. The NRC commissioners were to address policy, organization, and management items.

OBJECTIVES, SCOPE,
AND METHODOLOGY

The major objective of our review was to assess NRC and industry progress in implementing the Action Plan. To do this we sought

--the current status of each of the items in the Action Plan and

--the extent and cause of any delays in completing the Action Plan.

We used different approaches for obtaining information from each of the three groups responsible for completing specific Action Plan items. Each approach is discussed below. We did not evaluate the technical adequacy of completed Action Plan work or address the public safety implications of delays in completing other work in the Plan.

We conducted our audit work from September 1983 to June 1984. It was done in accordance with generally accepted government auditing standards.

Methodology for evaluating items
to be done by utilities

At the time of the Three Mile Island accident, NRC had licensed 65 nuclear power plants to operate in addition to the 2 Three Mile Island units. More than 80 other plants were under construction. We limited our review to the 65 operating plants other than the Three Mile Island plants because (1) plants licensed to operate after the accident were required to implement all applicable Three Mile Island requirements as a condition of receiving operating licenses and (2) NRC has dealt separately with the two Three Mile Island plants. As yet, unit 1 of these two plants has not resumed operations, and unit 2 has still not been totally cleaned up.

In May 1980 NRC directed the owners of the 65 nuclear power plants to implement 39 Action Plan items. Included in these items were plant changes that NRC had ordered shortly after the accident and that, in NRC's judgment, could not be delayed until NRC developed the Action Plan.

In November 1980 NRC issued a clarification to the Action Plan⁵ that provided additional information about technical positions, schedules, and requirements. This document subdivided the 39 utility Action Plan items into 142 separate tasks applicable to operating nuclear power plants and set out a specific schedule for completing each task. Of these 142 tasks, 131 required utilities to make changes, as applicable, at their plants. The other 11 tasks involved revising plant technical specifications--the voluminous and detailed document listing the conditions under which plants must be operated--on the basis of the changes made at plants to address the other 131 tasks. When we began our review in September 1983, NRC tracked utilities' progress on the 131 tasks in both the Action Plan Tracking System, a system it established for tracking all utility and NRC staff Action Plan work, and its Operating Reactor Licensing Actions Summary, a management report summarizing all NRC licensing actions applicable to nuclear power plants. It did not track the 11 tasks related to technical specifications in the systems, however, because it reviews, approves, and accounts separately for all proposed changes to plant specifications as a routine regulatory activity.

Because there are different types of power plants, utilities were not required to implement every one of the 131 tasks at each plant. According to NRC records the number of tasks applicable at each power plant ranged from 70 for 1 plant to 96 at several plants. NRC required a total of 6,004 separate actions at the 65 operating plants.

Questionnaire development and response

To determine the status of the actions at the utilities, we designed and used a questionnaire. Prior to sending the questionnaire, we pretested a draft of it at four utilities:

- Iowa Electric Power and Light, Cedar Rapids, Iowa;
- Philadelphia Electric Power Company, Philadelphia, Pennsylvania;
- Virginia Electric Power Company, Richmond, Virginia; and
- Wisconsin Public Service Company, Green Bay, Wisconsin.

The final questionnaire reflected the results of our pretests. Each questionnaire asked for information regarding completion of a single action at a specific plant.

⁵Clarification of TMI Action Plan Requirements (NUREG-0737), U.S. Nuclear Regulatory Commission, November 1980.

To obtain complete and candid responses from the utilities, we pledged confidentiality for the information provided. In addition, we assured the utilities that we would maintain the information provided in a manner that would prevent linking a specific answer to a particular utility. Using the sampling methodology described in appendix II, we selected 828 of the 6,004 actions for questionnaire distribution. This would allow us to project the sample results, with a 95-percent confidence level, to all actions. The questionnaires (see app. III, p. 54) were sent on December 9, 1983.

We received 648 completed questionnaires from 31 utilities concerning the status of actions at 51 power plants. Seven utilities that operate 14 power plants did not return the 180 questionnaires applicable to those plants. Accordingly, this response allows us to project our sample results, with a 95-percent level of confidence, to the 4,579 actions applicable to the 51 plants. Sampling error estimates for our projections are contained in appendix II, beginning on page 52. These 4,579 actions represent about 76 percent of the 6,004 actions applicable to the universe of 65 plants. A complete list of utilities and power plants receiving and responding to our questionnaires is shown in appendix IV, beginning on page 68.

Questionnaire follow-up

To help ensure the accuracy of the information received from the utilities and to obtain additional information on the status of the Action Plan, we conducted follow-up interviews with officials at seven utilities. We selected the following seven utilities because they are located in diverse areas of the country and they collectively operate a variety of different types of nuclear power plants:

- Arkansas Power and Light Company, Little Rock, Arkansas;
- Boston Edison Company, Boston, Massachusetts;
- Florida Power Corporation, St. Petersburg, Florida;
- New York Power Authority, White Plains, New York;
- Northern States Power, Minneapolis, Minnesota;
- Portland General Electric, Portland, Oregon; and
- Public Service Electric and Gas, Newark, New Jersey.

Determining the Action Plan item status

Our sample of 828 utility actions contained actions that were derived from 27 of the 39 utility Action Plan items. For these 27

items, we determined whether the sampled actions were complete at the 51 responding power plants.

To determine the status of the 12 utility Action Plan items not included in our sample, we used information contained in NRC's Operating Reactors Licensing Action Summary and inspection records. The Summary document shows the dates on which NRC and utilities agreed on required changes. NRC considers an action "complete" when this agreement is reached. To determine if these actions had actually been completed at plants, we reviewed NRC Office of Inspection and Enforcement inspection records.

Additional information

In addition to the questionnaires regarding the status of specific actions, by separate questionnaire we asked each of the 38 utilities operating the 65 power plants four general questions. These questions concerned the (1) status of all required actions at the utility, (2) actual and/or estimated dollar costs to implement the required actions, (3) additional permanent staff hired to meet Three Mile Island-related requirements, and (4) utilities' overall views of NRC's efforts to implement Three Mile Island-related regulatory requirements. We received 31 responses (82 percent) to our general questions. One response was submitted by a utility that elected not to complete our questionnaires on specific Action Plan actions. Conversely, one utility that completed and returned questionnaires on specific Three Mile Island actions did not complete our general questionnaire. Appendix IV shows which utilities provided responses to our general questions.

Our analysis of utilities' progress in implementing 39 Action Plan items is discussed in chapter 2, beginning on page 10.

Methodology for evaluating items requiring NRC staff action

The Action Plan identified 120 items that required additional development by the NRC staff before any changes could be required at nuclear power plants. The NRC staff divided these 120 items--called developmental items--into 222 separate tasks.⁶ To determine the status of these 120 developmental items, we sent questionnaires to NRC for each of the 222 tasks. We first pre-tested the questionnaires with 10 NRC staff members we selected from various divisions within NRC. Each selected staff member was involved in developmental work. All 222 questionnaires were completed and returned to us. (See app. VI, p. 72, for a copy of our questionnaire and consolidated NRC responses.) Later, for 73 of

⁶Forty-one of these 222 tasks concerned aspects of Action Plan items, approved for implementation by utilities, that also required additional development by the NRC staff.

the questionnaires (33 percent), we confirmed the information provided by meeting with selected NRC staff and obtaining supplementary documentation. To obtain complete and candid responses, we stated in the questionnaire that answers would be strictly confidential and maintained in a manner that would prevent linking a specific answer with a particular staff member.

We delivered the 222 questionnaires to NRC's Assistant for Operations in the Office of the Executive Director for Operations for distribution to the NRC staff members responsible for each of the 222 tasks. To maintain confidentiality, we included an envelope with each questionnaire. The Director of the Division of Safety Technology, Office of Nuclear Reactor Regulation, however, had managers and the Planning and Program Analysis staff review the staff responses to the 111 questionnaires assigned to that office. The Director stated that this review resulted in the addition of clarifying information and that--to the Director's knowledge--no information was deleted. Our review of the completed questionnaires and follow-up work with selected NRC staff led us to conclude that the Director's statement was correct.

Following our analysis of the 222 developmental task questionnaires (see ch. 2, p. 15), we used this information to determine the status of the 120 original developmental Action Plan items. (See ch. 2, p. 16.)

Methodology for evaluating items requiring NRC Commissioners' consideration

On September 16, 1983, we requested the Secretary, NRC, to provide detailed information regarding the status of the 17 Action Plan items that are the responsibility of the NRC Commissioners. In response to this request, we were provided copies of a May 18, 1984, memorandum to the Commissioners from NRC's Office of Policy Evaluation discussing the status of these items. Later, we met with the appropriate Commission staff to obtain additional explanatory information. Our analysis of the Commission items is in chapter 2, beginning on page 19.

Other audit work

In conducting this evaluation we reviewed pertinent documents and met with senior officials from the following groups in addition to the operating nuclear utility companies noted earlier. The purpose of these meetings was to obtain additional information on the Action Plan and implementation progress and problems.

NRC

--Office of the Executive Director for Operations,
which directs and coordinates NRC's operational and
administrative activities;

- Office of Inspector and Auditor, which conducts audits, investigations, and inspections to ensure the integrity of NRC operations;
- Office of Nuclear Reactor Regulation, which reviews nuclear power plant construction permit and operating license applications and oversees plant operations;
- Office of Nuclear Regulatory Research, which conducts research related to nuclear power plant regulation;
- Office of Inspection and Enforcement, which inspects construction and operation of nuclear power plants and takes enforcement action on inspection violations;
- Office of Resource Management, which provides budget, financial, and automatic data processing services;
- Office for Analysis and Evaluation of Operational Data, which evaluates nuclear power plant operating experience;
- Office of Policy Evaluation, which independently reviews NRC staff positions that require policy determinations by the Commissioners.

Nuclear Power Industry

- Atomic Industrial Forum; Bethesda, Maryland;
- Electric Power Research Institute; Bethesda, Maryland;
- Edison Electric Institute; Washington, D.C.

Other

- Union of Concerned Scientists; Washington, D.C.

CHAPTER 2

UTILITIES AND NRC IMPLEMENTATION OF THE ACTION PLAN

As of June 1984, utilities and NRC estimate that all of the Action Plan work they intend to complete will be finished by the end of 1989--almost 7 years longer than originally estimated in the Plan. At the 51 plants that replied to our questionnaires, utilities have made required changes, or demonstrated to NRC why changes were not needed, to implement about 84 percent of the plant-specific Three Mile Island requirements. In addition, the NRC staff has completed 55 percent of its Action Plan-related developmental tasks, and the Commission believes it has completed all 17 of its Action Plan items. A large segment of the remaining work--for example, 42 percent of the incomplete NRC staff developmental items--involves Action Plan items assigned the highest priority.

After determining the status of the individual plant actions, NRC staff developmental tasks, and Commission items derived from the Action Plan, we determined which of the 176 Action Plan items are complete. We considered an Action Plan item complete only if all plant actions, developmental tasks, or Commission activities derived from the item are complete. We estimate that 93 items, or 53 percent, are complete.

UTILITY IMPLEMENTATION OF THE ACTION PLAN

In 548 of the 648 questionnaires utilities completed and returned to us covering 51 nuclear power plants, the utilities stated that they had completed the particular Action Plan requirement. This projects to 3,825 (about 84 percent) of the 4,579 actions applicable to the 51 plants. According to the utilities, the remaining 100 actions covered in our questionnaires are not complete. This projects to 754 actions (16 percent) at the 51 plants. On the basis of the questionnaire responses and our follow-up work, we also found that the utilities

- completed about 15 percent of the required actions by demonstrating to NRC that changes in plant hardware and/or procedures were not needed,
- did not complete about 32 percent of the Action Plan requirements within the schedule spelled out in the Plan,

--will spend about \$1.7 billion to implement their Action Plan requirements,¹ and

--have both positive and negative views on the importance of Action Plan requirements to improving nuclear power plant operations.

Completing many actions did not require plant changes

In 92 of the questionnaires, utilities reported that they had completed the specific action and that completing the action did not require changes at their plants. Changes were not needed because the actions either (1) had been met in the original plant design, (2) had been completed prior to the Three Mile Island accident, or (3) were not appropriate at their plants. On the basis of the responses we received, we project that 707, or about 15 percent, of the actions required at 51 plants are in this category.

An example of one action in this category was the requirement that utilities provide emergency electric power to ensure that electric power is always available to control certain safety valves in pressurized water reactors--reactors cooled by water circulated under pressure. Utilities that own six plants² stated that no change was required at their plants. In three cases the requirement had been met in original plant designs; at two plants the requirement had been met prior to the Three Mile Island accident; and at the last plant the requirement was not appropriate because the plant did not have the type of valves identified by NRC.

Utilities used studies performed by internal staff, industry groups, and contractors to demonstrate to NRC why certain actions would not require a change at their plants. For example, NRC required all utilities operating pressurized water reactors to study the need for and, if necessary, install a system that would automatically turn off the reactor coolant pumps during an accident involving loss of the water used to cool the reactor. According to utility officials two of the major suppliers for pressurized water reactor systems studied this requirement and

¹This figure represents aggregate utility response to our questionnaire asking for general cost information. It includes responses covering (1) 54 nuclear power plants, including 48 of the 51 plants for which we obtained detailed information on selected Action Plan items and (2) 6 plants for which utilities provided general cost information but did not provide detailed information on selected Action Plan items.

²This represents all questionnaire responses for this action.

concluded that no change was necessary because, under certain circumstances, automatically turning off these pumps could contribute to the risk of reactor damage. According to the studies a more appropriate alternative was to allow reactor operators to control the pumps manually since they could best determine when the pumps should be turned off. Officials of two utilities said their utilities had contributed a total of \$137,000 toward conducting the studies.

The Chief of the Reactor Systems Branch in NRC's Office of Nuclear Reactor Regulation told us that in February 1983--following a review of initial utility responses on this issue--NRC issued a letter to all pressurized water reactor owners allowing reactor operators to manually control the reactor coolant pumps if certain parameters were met. Under the terms of this letter, utilities were not required to obtain NRC approval prior to implementing their emergency procedures. Rather, NRC stated it would conduct post-implementation reviews to ensure that the selected method meets NRC requirements. NRC is currently reviewing utility responses to the letter.

Some requirements are not being completed on schedule

In 106 questionnaires utilities stated that it took them from 1 to 45 months longer than the NRC implementation schedule to complete the specific actions. Our analysis of these questionnaires shows that, on the average, utilities took almost an additional 12 months to complete these actions. On a projected basis the 106 actions equate to 771 actions at the 51 plants we covered, or about 16 percent of the total actions required at these plants.

In addition, in 100 questionnaires utilities stated that they have not yet completed the action covered by the individual questionnaires. On a projected basis the 100 actions equate to 754 actions at the 51 plants, or about 16 percent of the total required actions. Almost 90 percent of these actions are assigned the Action Plan's highest priority. They provided estimated completion dates for 82 of the 100 sampled actions. The utilities said they expect to complete all but 4 of the 82 actions by the end of 1986, to complete 2 in 1987, and to complete the last 2 in 1989. Thirty-six of these 82 actions were assigned completion dates by NRC. Our analysis of these 36 questionnaires indicates that an average estimated slippage of 39 months is expected to occur between the utilities' current estimated completion dates and the dates established by NRC in its November 1980 clarification of the Action Plan.

Following is an example of an action that has not been completed. Fourteen of the 100 questionnaires in which utilities said action is not complete deal with the specific task of conducting design reviews of plant control rooms to identify and correct deficiencies. The purpose of this task was to enhance the

ability of nuclear power plant operators to prevent or cope with accidents by improving the information provided to them in the control room. The manner in which the reactor operators at the Three Mile Island plant had responded to the emergency was perceived by several investigative groups as a major contributing factor to the accident. Therefore, the Action Plan assigned a high priority to control room design. Our review of the 14 questionnaires returned by utilities shows that the latest estimated date that utilities provided for completing this action was September 1987.

During our follow-up discussions with seven utilities, officials of these utilities said that the major reasons for not completing actions in accordance with the schedule set out in the Action Plan were as follows:

- The feasibility of the scheduled completion date--For example, two of the seven utilities where we conducted follow-up discussions said that scheduled completion dates for hardware changes were not feasible because the changes required new types of equipment that needed further development before it could be used.
- The clarity and specificity of the technical requirements--In our follow-up discussions with seven utilities, we were told that some requirements were clear and specific while others were not. They stated that the goals of several actions were clear, but the methods to reach the goals were subject to interpretation.
- Staff availability--We asked the seven utilities to indicate any internal reasons that would have caused actions to be completed later than NRC's estimated date. Five of the seven responded that utility personnel were not readily available to work on all the actions.

Utility costs of the Action Plan

Of the 31 utilities that completed and returned our questionnaires on 51 plants, 30 utilities operating 48 plants also completed and returned our general questionnaire that asked for information on the overall dollar cost and staffing impact of the Action Plan. In addition to these utilities, one utility operating six plants completed and returned our general questionnaire but did not return the questionnaires on individual Action Plan requirements. Thus, we obtained general cost and staffing data from 31 utilities operating 54 plants.

In the aggregate these utilities spent about \$1.2 billion on Action Plan requirements at the 54 plants. They estimated that they would spend another \$500 million--for a total of \$1.7 billion--in completing all applicable Action Plan requirements. They also said they have added about 1,950 permanent employees to

their staffs because of the Action Plan requirements. This is about 37 employees per operating plant.

Utility views on Action
Plan requirements

As discussed in chapter 1, the Action Plan represented what NRC judged were the improvements necessary as a result of the Three Mile Island accident and subsequent investigations. In our questionnaires we asked utilities if particular actions should have been required at their plants. As discussed earlier utilities told us that completing an estimated 15 percent of the actions applicable to their 51 plants did not require them to make any changes; therefore, in the utilities' views these actions should not have been required at their respective plants.

In addition to the above actions, the utilities told us that

--39 percent of the actions were appropriately required because they improved plant safety, knowledge of plant operations, public and plant staff health protection, and emergency preparedness;

--25 percent of the actions should not have been required because they either were not cost effective or necessary for their plants; and

--they had no opinion on the remaining 21 percent of the actions.

These positive and negative views on the appropriateness of Action Plan requirements are illustrated by the following examples provided by several utilities:

--One action required improved utility procedures to ensure that nuclear power plant staff actions are technically correct, explicit, and easily understood for normal and accident conditions at a plant. This required utilities to perform analyses, prepare emergency procedures, and train their staffs. In their questionnaire responses 11 utilities said that this was an appropriate requirement because (1) the Three Mile Island accident clearly showed that improvements were needed, (2) their knowledge of plant behavior during an accident was enhanced, and (3) completing the requirement significantly improved their emergency operating procedures.

--An official of one utility stated that existing meteorological instrumentation at the utility's plant was adequate to monitor and assess the potential consequences of a radiation release to off-site properties. Nevertheless, he said, NRC required the utility to install new equipment

that, in his view, does not enhance the radiological monitoring capabilities enough to justify the cost. He stated that the utility expects to spend about \$1.7 million to purchase and install the system and another \$110,000 annually to maintain it.

--According to one utility official, installation of direct indicators that would show whether certain plant valves are open or closed was unnecessary. He said that several other methods already existed in the plant design, such as pressure and pressurizer level and discharge line temperatures, for operators to identify valve position. According to this official, the utility spent almost \$100,000 in making this modification.

--Another utility official stated that the auxiliary feed-water system at his utility's plant had already met NRC's Action Plan requirements before NRC issued those requirements.

NRC STAFF IMPLEMENTATION OF THE ACTION PLAN

According to the Action Plan, all NRC staff developmental items assigned a completion date were to be finished by January 1983 with the exception of two items related to monitoring and evaluating Three Mile Island cleanup activities. After the NRC Commissioners approved the Action Plan, the NRC staff subdivided the 120 developmental items assigned to it into 222 discrete developmental tasks for action by assigned staff organizations. Subsequently, it incorporated 54 of these tasks into other regulatory activities, such as (1) other Action Plan tasks, (2) NRC's Human Factors Program Plan,³ or (3) closely related Unresolved Safety Issues.⁴

On the basis of our analysis of the completed questionnaires on the 222 tasks and our subsequent discussions with NRC officials, we believe that the NRC staff has completed 122 tasks (55

³The Human Factors Program is a developmental program to ensure that human factors are properly considered in the design, operation, and maintenance of nuclear facilities. NRC estimates that the program will be completed by October 1985.

⁴Unresolved Safety Issues are a select part of a larger group of issues that NRC calls "generic safety issues." Generic safety issues are possible deficiencies in the design, construction, and operation of several or a class of nuclear power plants such that the protection of the public or the environment from radiation may be inadequate. NRC designates the highest priority generic safety issues as Unresolved Safety Issues and gives them special management attention.

percent). This figure includes 100 completed discrete tasks and 22 tasks that were incorporated into and completed as a part of other activities. None of these completed tasks, however, had led NRC to impose new regulatory requirements on the 65 nuclear power plants operating in 1979 as of June 1984 when we completed our audit work. At that time, according to the section leader in NRC's Operating Reactors Assessment Branch in charge of monitoring utilities' implementation of Three Mile Island requirements, NRC had not required existing plants to meet any additional regulatory requirements on the basis of these completed tasks. In commenting on our report (see p. 43), NRC said that 140 tasks (by its count) were resolved. NRC did not state, however, how many of the 140 tasks led to new requirements or whether any new requirements were applied to the 65 operating plants as well as plants undergoing NRC operating license review.

The NRC staff is actively working on 69 of the 100 incomplete tasks. It has suspended work on 31 tasks either because staff are not available or similar work is underway in other NRC programs. In this regard, as discussed in more detail in chapter 3, page 33, NRC now does not plan to complete 20 of the 31 suspended tasks because it believes they offer marginal or negligible contributions to safety.

We also found that the NRC staff has not, for the most part, met the completion schedules established in the Plan; nor has it followed the Action Plan priorities in completing its developmental tasks.

Many tasks have not been completed as originally planned

Of the 100 completed tasks that were not incorporated into other projects, NRC assigned estimated completion dates to 88. The latest original completion date was December 1984. Our analysis of those tasks shows that 51 (58 percent) were completed on schedule and the other 37 (42 percent) slipped an average of over 13 months.

Of the 69 tasks the NRC staff is actively working on, 39 are being addressed as discrete tasks. The remaining 30 have been incorporated into other regulatory activities. Twenty-nine of the 39 discrete tasks were assigned completion dates in the Action Plan; and in their questionnaire responses, NRC officials provided us with current estimated completion dates on 14 of the 29 tasks. Upon comparing initial and current estimated completion dates, we found that 11 tasks had been delayed, 2 were on schedule, and 1 was expected to be completed early. For 7 of the 11 delayed tasks, the average delay was about 37 months with a range of 3 to 60 months. For the remaining four delayed tasks, the questionnaire responses indicated that the tasks would be completed in

March 1984. As of October 1984, however, none of the four tasks had been completed; nor had NRC assigned the tasks new completion dates.

None of the 31 suspended developmental tasks will be completed as scheduled in the Action Plan. Of these 31 tasks the Action Plan assigned 5 tasks high priority and 15 of them medium priority.

In responding to our questionnaires, the NRC staff reported that the major reasons for schedule slippages were unrealistic original completion dates, unavailability of staff, additional time needed because of unanticipated technical problems, and the time needed to consider the views of the nuclear industry and the public. Following are three examples of high priority tasks and the reasons, according to our follow-up discussions with the NRC staff, why they were not completed as scheduled. In each case we obtained permission from the cognizant NRC staff member to identify these incomplete tasks.

--A completed priority 1 task concerned developing improved computer programs to analyze certain loss-of-coolant accidents. This task was originally scheduled for completion in December 1982, but it was not completed until October 1983. Unanticipated technical problems, associated with achieving the required computer program accuracy, caused this slippage.

--An active priority 1 task required the NRC staff to develop requirements to ensure that plant employees with unescorted access to power plants are not unfit for duty due to alcohol, other drugs, or other physical or psychological impairments. The NRC staff assigned an initial deadline to develop a final regulation by December 1982. The task required NRC to conduct studies, develop criteria, solicit public comments, and issue criteria. The NRC staff finished the majority of its work by March 15, 1984. The Commissioners then had additional concerns requiring resolution. On July 5, 1984, these issues were resolved, and the Commissioners directed the Executive Director for Operations to conduct negotiations with various utility groups before the final rule was issued. Finally, on October 17, 1984, the Commissioners determined that utilities would be allowed to develop their own programs, subject to NRC monitoring, and directed the NRC staff to prepare a policy paper on this issue. This paper is being developed.

--A high priority inactive task is "Control Room Design-- Develop a Design Standard." The NRC staff was to develop and issue a proposed regulatory guide based on an evaluation of industry standards for nuclear power plant control rooms by May 1982. This task is inactive while NRC waits for industry to finalize its standards for control room design.

The pace at which NRC has addressed, resolved, and implemented solutions to nuclear power plant safety issues--including but not limited to Three Mile Island Action Plan developmental tasks--was the subject of a recent report we issued.⁵

In that report we evaluated NRC's overall management of generic issues--possible deficiencies in the design, construction, or operation of several or a class of nuclear power plants such that the protection of the public or the environment from radiation may be inadequate. We found that, largely because of the numerous issues raised by the Three Mile Island accident (and addressed in the Action Plan and related developmental tasks), NRC would take at least 10 years at its current pace to address and dispose of the backlog of unresolved issues. We recommended that NRC assess ways of eliminating the backlog of issues--including issues derived from the Three Mile Island Action Plan--sooner than 10 years.

NRC has not completed tasks in accordance with its priority system

As discussed in chapter 1, NRC's system for assigning priorities to Action Plan items was designed to ensure that tasks with the greatest potential for improving safety in the shortest time and at the lowest cost were assigned the highest priority. NRC expected, therefore, that high priority Action Plan tasks would generally be completed ahead of other tasks. Our analysis of the 222 questionnaire responses on the NRC developmental items revealed that this has not been the case. As shown in the following table, NRC's completion rate for high priority tasks is close to its average completion rate for all tasks.

Comparison Between Complete and Incomplete Tasks by Priority

| <u>Priority</u> | <u>Total tasks</u> | <u>Completed tasks</u> | | <u>Incomplete tasks</u> | |
|-----------------|--------------------|------------------------|----------------|-------------------------|----------------|
| | | <u>Number</u> | <u>Percent</u> | <u>Number</u> | <u>Percent</u> |
| 1 | 89 | 52 | 58 | 37 | 42 |
| 2 | 63 | 27 | 43 | 36 | 57 |
| 3 | 38 | 22 | 58 | 16 | 42 |
| No priority | <u>32</u> | <u>21</u> | 66 | <u>11</u> | 34 |
| Total | <u>222</u> | <u>122</u> | 55 | <u>100</u> | 45 |

⁵Management Weaknesses Affect Nuclear Regulatory Commission Efforts to Address Nuclear Safety Issues Common to Nuclear Power Plants (GAO/RCED-84-149, Sept. 19, 1984).

When we met with staff of NRC's Division of Safety Technology to discuss questionnaire results, they informed us that the highest priority tasks probably had a lower completion rate because they were the most technically complex and required the most effort. In addition, questionnaire respondents often stated reasons why individual tasks had not been completed or had taken longer to complete than originally anticipated. Three such examples were discussed earlier in this chapter on p. 17.

Because our review focused on all 176 items in the Action Plan, time and our available resources did not permit us to analyze why less than one half of the 122 completed tasks are the highest priority. It does not appear to us, however, that the technical complexity and level of effort is a logical explanation for completing high priority tasks at about the same rate as all tasks since

- the priority system gave the highest weight to the tasks with the greatest potential for improving safety in the shortest time at the lowest cost and
- the Action Plan stated that high priority items should be completed as planned while initiation of lower priority items could be delayed for 1 or 2 years.

COMMISSION IMPLEMENTATION OF THE ACTION PLAN

The Action Plan listed 17 items directed at enhancing NRC's regulatory mission. These items related to two fundamental assertions stemming from conclusions of the President's Commission on the Accident at Three Mile Island and the NRC Commissioners' Special Inquiry Group. The assertions were that (1) NRC had not articulated a substantive safety standard or policy that underlies its regulatory decisions and (2) NRC's organization and management were inadequate to protect public health and safety. In the Action Plan these 17 items were to be the responsibility of the NRC Commissioners because they related to NRC policy, organization, and management issues.

These 17 items were not assigned priorities in the Action Plan because they were to be addressed in the normal course of Commission business. However, in July 1980 the Commission stated its views on further action on the 17 items, including schedule requirements, and directed that the Action Plan be modified accordingly. This revision to the Action Plan was issued in August 1980. It assigned completion schedules for 10 of the 17 items, with October 1981 as the latest completion date, and outlined the specific actions required to complete each of the 17 items.

At the time we completed our audit work, NRC believed that 16 of the 17 items were complete in terms of the specific actions

required by the revised Action Plan. In commenting on our report, NRC said it now considers the remaining item complete.

Completed actions as of June 1984

The President's Reorganization Plan No. 1 of 1980, as amended, effective October 1, 1980, and the Commission's implementation of the Reorganization Plan completed these five Action Plan items:

- study NRC's top management structure and process;
- reexamine the organization and functions of NRC offices;
- revise delegations of authority to the NRC staff;
- clarify and strengthen the respective roles of the Chairman, the Commission, and the Executive Director for Operations; and
- seek the authority to delegate emergency response functions to a single commissioner.

The thrust of the President's Reorganization Plan of 1980, as amended, was to strengthen the authority of the NRC Chairman, relative to the other commissioners, and of the Executive Director for Operations, relative to other staff-level officers. The full Commission retained responsibility for formulating policy, establishing agency rules and regulations, issuing orders, and making final agency decisions in licensing proceedings. The Chairman is responsible for carrying out all other NRC functions and is the principal executive officer of the agency. The Executive Director for Operations reports to the Chairman on all matters.

The Reorganization Plan, as amended, also assigned the NRC Chairman authority to respond to nuclear emergencies and authorized the Chairman to delegate this authority to another commissioner.

Three other items completed by the NRC Commissioners were the following:

- Study the elimination of nonsafety responsibilities--In July 1980 the Commission decided not to seek legislative approval to transfer nonsafety functions, such as antitrust reviews of nuclear power plant license applications, National Environmental Policy Act of 1969 responsibilities, and export licensing, to other federal agencies. In February 1980 the Commission did support transfer of export licensing, but the administration decided not to pursue this matter.

- Strengthen the role of the Advisory Committee on Reactor Safeguards--The Commission authorized additional technical staff positions for the Committee. In addition, the Commission established procedures to focus NRC staff attention on the Committee's recommendations and to involve the Committee in Commission rule-making activities.
- Study the need for additional advisory committees--In July 1980 the Commission decided that no additional advisory committees were warranted. It also requested a study aimed at ensuring that a broader spectrum of representatives of the public and other organizations periodically appear before the Commission. Subsequently, the requirement for a study was dropped, and the subject of ensuring that a broad spectrum of the public appears before the Commission was included as a part of the licensing reform Action Plan item discussed on p. 23.

Items completed but
related changes not made

For eight other items, the Commission has completed the specific activities described in the Action Plan. The Commission has not as yet, however, made any changes in policy, organization, or management practices as a result of completing these items.

As one example, the assertion that NRC had not articulated a substantive safety standard or policy⁶ that underlies its regulatory decisions led to an Action Plan item requiring further NRC delineation of a substantive safety policy. The schedule for completing this item stated that a general plan for developing or articulating safety objectives was to have been presented to the Commissioners by August 7, 1980, with a draft statement of the policy issued by January 1, 1981. However, although the Three Mile Island investigations recommended that NRC adopt a safety policy, the language in the Action Plan is not as explicit. It states that the Commission ". . . will endeavor to develop more explicit articulation of (safety) policy."

The Commission issued a plan for developing a safety policy on October 7, 1980, followed by two proposed policy statements on safety goals for nuclear power plants on February 17, 1982, and March 14, 1983. In the latter statement the Commission announced a 2-year evaluation period for the proposed safety goals policy. At the conclusion of the evaluation period, the Commission will consider the need for revisions and decide if a final policy

⁶In commenting on the draft report, NRC stated that it now believes a more accurate description of this item would be developing a "safety goals policy" instead of a substantive "safety policy" as specified in the Action Plan. (See p. 48 for NRC's detailed comments.)

should be adopted. Therefore, while the efforts specifically described by the Action Plan are complete, NRC is not yet ready to decide on a final safety policy.

The remaining seven completed items cover subjects that vary from improving NRC's process for conducting public hearings on nuclear power plant license applications to finding a single location for the entire agency headquarters. Following is a list containing each item and the action taken to complete each item:

--Improve Public Participation in the Hearing Process--The objectives of this item were to assess alternative methods for enhancing public participation in the NRC hearing process and to study the concept of establishing an office of public counsel. The Commission initially decided to establish a pilot program to provide funding for individuals and groups who participate in NRC's licensing hearings. This funding was not approved by the Congress. Subsequently, on July 25, 1980, the Commission established a rule to provide without charge, upon request, transcripts and copying services to parties other than a license applicant. This rule was suspended, however, on February 24, 1981, following a Comptroller General's opinion that NRC's 1981 appropriations act prohibited the use of appropriated funds for this purpose.⁷ In July 1980 the Commission requested a study of alternative methods to ensure broader public participation in the hearing process. The NRC staff completed this study in October 1980.

The Commission's Office of Policy Evaluation staff informed us that the Commission considers this item complete because methods for improving public and intervenor participation in the NRC hearing process are included as a part of the Commission's ongoing consideration of potential licensing reform measures. Information provided to us by NRC does not show any Commission study or other activities concerning establishing an office of public counsel.

--Study Construction during Adjudication Rules--The objective of this item was to determine whether construction should be permitted while legal challenges to a construction permit are considered. A rule-making effort⁸ was initiated on May 22, 1980, with the issuance of a draft rule for comment. In October 1982 the Commissioners sought

⁷Letter to the Chairman, Subcommittee on Energy Research and Production, House Committee on Science and Technology, from the Comptroller General of the United States; B-200585, Dec. 3, 1980.

⁸This rule-making effort consists of proposing a rule change, obtaining and considering comments, and, if necessary, issuing a new or revised rule.

public comment on a proposed rule that, if adopted, would require the Commission to make this determination on a case-by-case basis. No final rule has been promulgated; however, the specific Action Plan requirement--to study this issue--is complete.

--Study the Need to Establish an Independent Nuclear Safety Board--The objective of this item was to study the need for an independent nuclear safety board that would investigate nuclear accidents and important incidents as well as monitor NRC's regulatory process. In July 1980 the Commission decided that such a board was not needed. Several earlier actions were the basis for this decision: (1) on March 18, 1980, the President established a Nuclear Safety Oversight Committee to report periodically on progress in improving nuclear safety; (2) NRC created the Office for Analysis and Evaluation of Operational Data to evaluate accidents and other plant operating experiences; (3) the nuclear industry established two groups--the Institute of Nuclear Power Operations and the Nuclear Safety Analysis Center--that have nuclear power plant safety-related functions; and (4) the Congress has expressed interest in establishing a Nuclear Safety Board in the Executive Branch to investigate events at facilities regulated by NRC. The Nuclear Safety Oversight Commission established by the President was terminated in 1981 in accordance with the Executive Order that created it.

In commenting on the report, NRC said that the 1984 NRC Authorization Act requested NRC to reexamine the concept. NRC added that a report of a study of the concept by Brookhaven National Laboratory has been published and the issue is currently under active NRC consideration.

--Study the Reform of the Licensing Process--The objective of this item was to study alternatives to the process NRC uses to license nuclear power plants. In January 1980 a comprehensive NRC licensing reform bill was introduced in the House of Representatives. Since that time other licensing reform bills have also been introduced, but none has been approved. For example, the Commission sponsored one bill--the Nuclear Licensing Reform Act of 1983 based on the work of its Regulatory Reform Task Force--that was not passed. The Commission believes that this task force's work and the Commission's deliberations leading up to its licensing reform bill constitute completion of this item. According to the Commission's Office of Policy Evaluation, the Commission also annually studies licensing reform methods.

--Achieve a Single Location--Two Action Plan items deal with this subject--one on an interim basis and one on a long-term basis. The objective of these items was to obtain a

single location for NRC's headquarters staff, which are scattered in several locations in Washington, D.C., and nearby suburban Maryland. The Commission has worked with congressional committees and the General Services Administration to achieve a single location. The consolidation depends on the General Services Administration's ability to locate adequate space. On February 9, 1984, the Chairman, NRC, restated the continuing need for the consolidation of NRC offices in testimony before the House Subcommittee on Energy and Environment, Committee on Interior and Insular Affairs. The Chairman pointed out that numerous studies--including the President's Private Sector Survey on Cost Control--recommend consolidation of NRC headquarters to improve operating efficiency and reduce costs. Although the Commission had not achieved a single headquarters location, its efforts over the years, as described above and in two of our earlier reports,⁹ constitute--in our view--completion of these two Action Plan items.

--Reexamine the Commission's Role in Adjudication--Investigations of the Three Mile Island accident concluded that the NRC Commissioners had unnecessarily isolated themselves from the agency's nuclear power plant licensing process. The objective of this item was to review the Commission's role in nuclear power plant licensing decisions and eliminate unnecessary and undesirable Commission insulation from the NRC staff. According to the Office of Policy Evaluation staff, the Commission considers this item complete because this role has been and continues to be examined by the Commissioners as a part of their periodic consideration of nuclear power plant licensing reform.

The incomplete item as of June 1984

One Commission item was not complete as of June 1984. This item--Study the Need for Three Mile Island-Related Legislation--involved six distinct activities. Our review of the NRC documentation regarding the status of this item, which was to have been completed by August 1980, indicated that three activities were complete and that the Commission had not considered the remaining three.

For one of the three completed activities--determine if the Commission has legislative authority to issue amendments to nuclear plant licenses without conducting a public hearing--the Commission decided that it has such authority. In commenting on our draft report, NRC stated that Section 12 of Public Law 97-415,

⁹Proposed Interim Consolidation of the Nuclear Regulatory Commission (EMD-80-118, Sept. 11, 1980); and Further Evaluation of the Proposed Interim Consolidation of the Nuclear Regulatory Commission (EMD-81-76, June 24, 1981).

dated January 4, 1983, clarified this authority. For the second activity--study whether NRC should seek legislation relieving it of the requirement to provide advance public notice of Commission meetings in emergency situations--the Commission believes that the provisions of the President's Reorganization Plan No. 1 of 1980, as amended, that placed emergency functions with the Commission Chairman, have made it less likely that this would be a problem during an emergency similar to the Three Mile Island accident.

The third activity involved the study of certain provisions of the Price-Anderson Act (Section 170 of the Atomic Energy Act of 1954, as amended) that limits the nuclear industry's liability for damages stemming from nuclear accidents and provides for federal government indemnification up to the amount of liability. The Commission commented on various legislative initiatives regarding nuclear liability and, in November 1983, provided a congressionally mandated report to the Congress concerning the need for continuation or modification of the Price-Anderson Act. The report recommended continuing the coverage of the Price-Anderson Act and suggested certain revisions. A part of the Price-Anderson Act consideration was a reexamination of the definition of an "Extraordinary Nuclear Occurrence." The NRC Commission has recently issued for public comment a revised statement of the criteria to be used in determining when a nuclear accident should be considered such an occurrence.

Neither we nor the Commission's Office of Policy Evaluation could find any record of Commission action or plans for future action on the remaining three activities as of June 1984. The three activities are

- determining NRC's legal authority to conduct cleanup activities at a nuclear facility, the federal government's liability for damages during an NRC cleanup, and entitlement to reimbursement for cleanup costs;
- assessing the need for a new category of licenses to be issued for a facility during an extended recovery period following a major accident; and
- assessing the need for a new or modified NRC authority to address the establishment of a chartered national company to operate nuclear power plants.

In reviewing the documentation concerning the three activities, we found that the Commission's Offices of Policy Evaluation and General Counsel had suggested to the Commission in August 1980 that near-term actions were not required and that future actions should be deferred until a need could be established. In addition, in a May 1984 memorandum to the Commission, the Office of Policy Evaluation pointed out that these three activities had not yet been completed. In commenting on the draft report, however, NRC said that further study leads it now to conclude that the three activities listed above have been completed.

With respect to the first two activities, NRC said that experience gained in response to the Three Mile Island accident confirms its 1980 view that no legislative action is necessary and future actions should be on an as-needed basis. NRC added that if future experience shows that its authority is insufficient to ensure the safety and timeliness of cleanup operations, it will take steps to secure the necessary additional authority. Regarding the third activity, NRC provided additional information regarding its efforts to assess the need for a chartered national company to operate nuclear power plants. On June 23, 1983--in response to this issue as raised by one Commissioner--the Office of Policy Evaluation provided an analysis to the Commission of the potential value of a national operating company. Although the Commissioners took no formal action in response to the analysis, NRC said that it now considers this activity complete since the Action Plan called for only a study of the need for a national operating company.

SUMMARY OF ACTION PLAN IMPLEMENTATION

Our primary objective was to determine the status of the 176 Action Plan items. As described in chapter 1 and discussed earlier in this chapter, to do this we

- sampled utility implementation of the thousands of individual plant actions that, when completed, will constitute completion of 39 items;
- obtained information from the NRC staff on the status of the 222 developmental tasks that, in total, make up 120 Action Plan items; and
- obtained information from the Commission's Office of Policy Evaluation on the 17 Commission items.

On the basis of the information we obtained from 51 operating plants and from NRC, we estimate that 53 percent of the 176 Action Plan items are complete, as shown in the following table. The paragraphs following the table discuss how we derived this estimate for the utility, NRC staff, and Commission items.

Completed Action Plan Items

| <u>Responsible group</u> | <u>Assigned items</u> | <u>Completed items</u> | <u>Percent</u> |
|--------------------------|-----------------------|------------------------|----------------|
| Utilities (51 plants) | 39 | 19 | 49 |
| NRC staff | 120 | 57 | 48 |
| Commission | <u>17</u> | <u>17</u> | 100 |
| Total | <u>176</u> | <u>93</u> | 53 |

Our original sample of actions required at operating nuclear power plants was designed to permit us to project, on the basis of questionnaire results, how many of the total number of actions derived from the 39 utility items in the Action Plan have been completed. As discussed earlier, we project that utilities have implemented 84 percent of the actions at the 51 plants for which we obtained information.

Our sample included one or more utility actions derived from 27 of the 39 utility items. (See app. VII, p. 86, for a list of utility items.) On the basis of the questionnaires we received, we estimate that 11 of the 27 utility items covered in our sample have been completed at 51 plants. In addition, NRC's Operating Reactors Licensing Summary shows that all plants have completed 8 of the 12 items not included in our sample, for a total of 19 of 39 Action Plan items completed at the 51 plants. This NRC report, however, considers an action "complete" when NRC reaches agreement with a utility on action to be taken at a plant even though the utility has not actually made the change NRC agreed to. Therefore, we also reviewed information maintained by NRC's Office of Inspection and Enforcement on inspections of the utility actions to implement the eight items NRC's report shows as complete at all plants. This information shows that NRC has inspected and approved as complete 91 percent of the utility actions derived from these eight Action Plan items.

For the 120 NRC staff developmental items, we considered an item complete if all tasks derived from the item were complete. Appendix VIII, page 89, is a listing of incomplete high priority developmental items.

For the 17 Commission items, we considered an item complete if the Commission had either taken the specific actions described in the Action Plan--such as "studying" an issue--or explicitly decided not to take any additional action.

AGENCY COMMENTS AND OUR EVALUATION

NRC made 19 comments related to the matters discussed in this chapter and our methodology for selecting the separate Action Plan-related tasks that utilities and the NRC staff were charged with carrying out. Five NRC comments dealt with accounting for the correct number of tasks derived from the Action Plan. NRC's position is that 352 tasks--94 assigned to utilities and 258 assigned to the NRC staff--have evolved out of the Action Plan in addition to the 17 items assigned to the Commission.

In September 1983, when we began our audit, NRC's Action Plan tracking systems showed that utilities were responsible for implementing 131 tasks and the NRC staff were responsible for work on 222 tasks. We used these tasks as the basis for developing and administering our questionnaires to utilities and to the NRC staff. Subsequently, however, on at least two occasions, NRC has

compiled Action Plan-related tasks in a generic issues management document and, in so doing, has subdivided Action Plan items in ways that are different than it did when we developed our questionnaires. For example, in November 1983 and June 1984, NRC counted 63 Action Plan tasks to be implemented by utilities-- instead of the 131 it counted in September 1983--and in December 1984 NRC counted 94 utility tasks. All of these changes stem from changes NRC has periodically made in the way it has subdivided and counted the 176 items listed in the Action Plan.

Eight NRC comments provided additional clarification of our discussion of the 17 Action Plan items assigned to the Commissioners. The other six comments either provided factual clarification or requested us to provide additional information in the report on the matters discussed. We changed the report as appropriate to reflect these comments.

Appendix I, beginning on page 37, contains the text of NRC's comments and our detailed responses to each of them.

CHAPTER 3

NRC SHOULD ACCOUNT FOR

ACTION PLAN PROGRESS

When issued, the Action Plan constituted what NRC judged were the actions necessary to improve the operation and regulation of nuclear power plants. The Plan assigned responsibility for each item and, for the majority of items, assigned priorities, projected resource requirements, and estimated completion dates. Because the Plan was an ambitious undertaking that placed heavy reliance on the nuclear industry, we recommended in a May 1980 report¹ that NRC periodically report progress on each Action Plan item to the Congress. NRC suggested, and we agreed, that its annual reports to the Congress would be a suitable reporting mechanism.

Since 1980, however,

--much of the Action Plan work has slipped several years,

--many high priority items have not been completed,

--NRC has decided not to complete some Action Plan work, and

--NRC staff reporting has overstated utilities' progress on the Action Plan.

Furthermore, with the exception of its 1981 annual report, NRC has reported little information on the Action Plan either in its annual reports or in reports it submits each month to an appropriations subcommittee of the House of Representatives on its licensing and related regulatory activities. Finally, NRC has merged management of Action Plan tasks with other safety issues.

In view of the above, we believe that NRC should provide the Congress with a one-time report describing the status of each Action Plan item, addressing the significance of each incomplete item to public safety, and showing how incomplete items will be pursued, accounted for, and reported on in the future.

NRC REPORTS TO THE CONGRESS HAVE CONTAINED LITTLE INFORMATION

In a May 1980 report on the Action Plan, we concluded that NRC's efforts to identify and consider Three Mile Island-related recommendations, assign priorities, and estimate schedules and

¹Do Nuclear Regulatory Commission Plans Adequately Address
Regulatory Deficiencies Highlighted by the Three Mile Island
Accident? (EMD-80-76, May 27, 1980).

resources were adequate. We also stated, however, that NRC was stretching its resources thin and placing a major dependency on the nuclear industry. Therefore, as a mechanism for congressional oversight, we recommended that NRC periodically report to the Congress progress in implementing each item in the Action Plan. In commenting on a subsequent report² we issued, NRC suggested that its annual report to the Congress would be a suitable way of conveying this information. We agreed with this approach as long as NRC included enough information to clearly describe progress in improving reactor safety and accomplishing the objectives of the Action Plan.

Annual reports

NRC discussed the Action Plan in its 1980 Annual Report issued on March 17, 1981. This report included an appendix listing the status of each Action Plan item. The report did not include information on the resources expended or necessary to complete the Action Plan, changes in the Action Plan schedules, or when the Action Plan would be completed.

Since this first report, NRC has included little information on the Action Plan in subsequent annual reports. NRC's 1981 and 1982 annual reports concentrated on utilities' implementation of Action Plan requirements at operating plants. The NRC staff developmental items and Commission items were not discussed in the 1981 annual report. The 1982 report stated simply that "a number of items in the Three Mile Island Action Plan are still under development by the NRC; work on some of the lower priority items was delayed during fiscal year 1982." As shown in chapter 2, over one half of the 120 developmental items are incomplete.

NRC's 1983 annual report contained one paragraph stating that an Action Plan had been issued and that requirements approved for implementation by utilities were later clarified. The following paragraph from that report presents NRC's entire comments on the status of the Action Plan.

"The accident at Three Mile Island Unit 2 (Pa.) in 1979 led to a thorough review of NRC regulatory and licensing requirements for nuclear power plants. A TMI Action Plan was issued as NUREG-0660, and the requirements approved for implementation at plants in operation or under construction were later clarified in NUREG-0737. Approximately 90 percent of these requirements for operating reactors have now been acted on, and 70 percent of required actions have been reviewed by NRC staff. TMI

²Three Mile Island: The Most Studied Nuclear Accident in History
(EMD-80-109, Sept. 9, 1980).

Action Plan requirements for plants under construction are being implemented as part of the licensing process, while those for operating reactors are being confirmed by NRC orders."

None of NRC's annual reports have discussed the results of the developmental items completed by the NRC staff. That is, NRC has not reported whether completing these tasks led to any new regulatory requirements; if not, why not; and if so, whether the new requirements were imposed on operating plants or limited to plants under construction.

Reports to a congressional subcommittee

In House Report 96-1093, on the Energy and Water Development Appropriation Bill for fiscal year 1981, the Subcommittee on Energy and Water Development, House Appropriations Committee, directed NRC to provide a monthly report on the status of its licensing and regulatory activities. While this report did not require reporting on the Action Plan as an entity, one subcommittee consideration leading to this requirement was concern over the NRC Office of Nuclear Reactor Regulation's ability to incorporate the lessons learned from the Three Mile Island accident into NRC's licensing and regulatory process in an orderly and systematic manner.

The first NRC report--issued November 21, 1980--in response to this request included an overview of the Three Mile Island Action Plan. None of the subsequent monthly reports mentioned the Action Plan except the April 30, 1981, report. In this report then-Commissioner Bradford stated that "despite the Committee's directions in House Report 96-1093, no monthly report to date has included a meaningful discussion of the work necessary to incorporate the lessons learned from the Three Mile Island accident into the Commission's licensing and regulatory process."

NRC'S MEASUREMENT OF UTILITY PROGRESS IS OVERSTATED

NRC's Operating Reactors Assessment Branch now reports that 90 percent of the required utility actions are complete. On the basis of questionnaires returned to us by utilities on 51 nuclear power plants, however, we project that about 84 percent of the actions are complete at power plants.

We discussed this difference with the Deputy Director of NRC's Division of Licensing and members of the Operating Reactors Assessment Branch and were informed that there were two reasons for the difference. First, as discussed earlier, the information NRC compiles in its Operating Reactor Licensing Action Summary shows actions as "complete" when NRC and utilities reach agreement on necessary changes. We considered actions complete, on the

other hand, only if utilities had actually made the changes or demonstrated to NRC's satisfaction that changes were not needed.

Second, NRC no longer uses the original 6,004 actions required at 65 nuclear power plants, discussed in chapter 1 on page 5, as its basis for reporting a completion rate. For reporting purposes, NRC removed 455 plant actions from its summary of utility actions to implement the Action Plan because in December 1982 it had issued to utilities additional instructions and time to implement these actions. At that time NRC began separately tracking progress on these actions. Because utilities had not completed these actions at that time, excluding the 455 actions from its progress reports on the Action Plan had the effect of increasing the percentage of actions that NRC considers complete.

NRC MERGED MANAGEMENT OF ACTION PLAN TASKS WITH OTHER SAFETY ISSUES

In December 1983 NRC published a report, Prioritization of Generic Safety Issues (NUREG-0933), that lists the 482 generic issues it has identified over the years. The list includes utility and NRC staff tasks derived from the Three Mile Island Action Plan. This report ranked 123 of the 482 issues according to their importance to safety.³ In ranking these issues, NRC used a new risk-based system that, as we found in our report on NRC's management of generic issues, is an improvement over earlier ranking systems, such as the one used in the Action Plan.

This NRC report, which NRC updated in June 1984 and in December 1984, is an effort by the agency to consolidate management of all generic safety issues so that the issues most important to safety--whether derived from the Three Mile Island accident or other sources--can be addressed first.

NRC is now using this document and a companion management system (Generic Issues Management Control System) to manage and account for its efforts to identify, address, and dispose of all generic issues (including the utility and NRC tasks derived from the Three Mile Island Action Plan). Thus, in the opinion of NRC staff in its Division of Safety Technology, Office of Nuclear Reactor Regulation, the Action Plan is no longer a meaningful measure of actions necessary to improve the operation and regulation of nuclear power. NRC has not, however, closed out the Action Plan, in conjunction with setting up its new system for managing safety issues, to reflect this view.

³The other issues were not ranked because they were either resolved, nearly resolved, not related to safety (such as environmental issues), incorporated into similar issues, or scheduled to be ranked at some future time.

From an issue management standpoint, we believe NRC's decision to integrate Action Plan tasks with other generic issues was sound. It will permit NRC to focus its work on the issues most important to safety--as determined with the new ranking system--without regard to their origin. For example, as stated in our earlier report, in 1980 NRC was concentrating on Three Mile Island-related issues without a clear understanding of how important to safety these issues were, relative to issues derived from other sources.

One result of NRC's integration and prioritization of all generic issues in its December 1983 report is that it will not complete at least 20 Action Plan developmental tasks. In that report NRC decided to drop further work on 7 Action Plan tasks because of what it judged was their negligible safety significance. It assigned 13 other developmental tasks a "low" priority. On November 16, 1984, in responding, as required by the Legislative Reorganization Act of 1970, to the recommendations contained in our September 19, 1984, report on NRC's management of generic issues, the Chairman, NRC stated that low priority generic issues ". . . need not and will not be resolved because of their marginal contribution to safety."

CONCLUSIONS

Time is passing the Three Mile Island Action Plan by. The accident occurred 6 years ago, thousands of related changes have been made at operating nuclear power plants, and NRC has studied many other ideas and issues raised by the accident. Utilities told us, however, that they will not complete work on the plan until 1989--10 years after the accident. To date, NRC's reporting on Action Plan progress has been fragmented and usually focused in summary fashion on the Action Plan requirements utilities are implementing at their plants. In the Action Plan, however, these requirements constitute but 39--22 percent--of the 176 items.

Compounding the lack of full reporting is NRC's movement away from discretely tracking both utilities' progress on the 6,004 plant actions derived from the Action Plan and the NRC staff's progress on developmental tasks. In addition, NRC has merged the Action Plan tasks into a new generic issues management system but has not taken the additional complementary step of formally closing out the Action Plan. While there is sound reason for NRC to consolidate management of safety issues derived from all sources, NRC is losing its ability to account for the Action Plan, which, when issued, represented the improvements that NRC judged necessary in nuclear power plant operations and regulation derived from the Three Mile Island accident and subsequent investigations.

In view of the time that has passed since the Three Mile Island accident, the limited NRC reporting of progress in implementing the Action Plan, and the incorporation of Action Plan

tasks into NRC's new system for managing nuclear power plant generic issues, NRC should provide the Congress with a one-time detailed accounting for the Action Plan that

- reports utilities' progress in implementing Three Mile Island-related changes at their nuclear power plants,
- describes the status and results of the Action Plan items that were the responsibility of the NRC staff and Commission; and
- shows how incomplete Action Plan items will be pursued, accounted for, and reported on under the new generic safety issues management system.

Most, if not all, of the information necessary to prepare such a report is available in the various Office of Nuclear Reactor Regulation and Office of Inspection and Enforcement management information systems discussed in this report.

RECOMMENDATION TO THE CHAIRMAN,
NUCLEAR REGULATORY COMMISSION

To inform the Congress on utilities' and NRC's progress in implementing the Three Mile Island Action Plan, we recommend that the Chairman, NRC, report to the Congress a one-time, item-by-item accounting of the 176 items listed in the Action Plan.

For the 39 utility Action Plan items, the report should address

- items completed at all of the 65 nuclear power plants that were operating when the Three Mile Island accident occurred and
- items that have not been completed at all plants, the number of plants that have not completed each item, and the expected date that each item will be complete at all plants.

For the 120 Action Plan developmental items, the report should address

- items that have been completed, the resulting NRC staff product(s), and any related changes in nuclear power plant regulatory requirements or NRC regulatory procedures and
- items that have not been completed, when NRC expects to complete each item, or the reason why the item will not be completed.

For the 17 Action Plan items assigned to the Commission, the report should discuss the actions taken, Commission plans for any additional action, and whether or not Commission action on each item has led, or may lead, to changes in NRC's policies, organization, or management practices.

Finally, the report should address the significance of incomplete Action Plan items to public safety and show how NRC intends to pursue, account for, and report on these items in NRC's new generic safety issues management system.

AGENCY COMMENTS AND OUR EVALUATION

NRC stated that it is withholding comments on our conclusion and recommendation until it receives the final report. It did, however, provide six specific comments on the matters discussed in this chapter (and in the digest and cover summary). One comment was a minor technical correction, which we accepted.

The remaining five comments were related to our position that NRC is losing its ability to account for implementation of the Action Plan, no longer measures progress on the Plan, and, therefore, should dispose of the Plan by means of a public accounting of the status of each of the 176 Action Plan items. Basically, NRC's position is that its management systems provide it with the capability of tracking Action Plan progress, the reports generated by these systems are publicly available, and NRC continues to vigorously pursue the work embodied in the Action Plan.

We acknowledge that by using NRC's various tracking systems one can determine how the 176 Action Plan items evolved into (1) the number of tasks NRC tracked when we began our review and (2) the subsequent changes that NRC has periodically made in the way it has subdivided and counted these tasks. What one cannot do with NRC's systems, however, is readily determine

--the extent to which the original utility items have been satisfactorily completed at operating nuclear power plants,

--how many of the 120 NRC staff developmental items listed in the Action Plan have been completed and what were the results of completing the items, and

--reasons why work on the Action Plan has not proceeded as originally anticipated with respect to the schedules for completing the work and the priorities set out in the Action Plan.

In summary, properly accounting for progress on the Action Plan, and its eventual disposition, requires more than detailed tracking systems, which show the various and changing tasks and who within NRC or the nuclear industry is responsible for each task. NRC issued the Action Plan as a way of documenting the

actions it judged necessary, in response to the Three Mile Island accident, to improve the operation and regulation of nuclear power plants. Therefore, we believe it has an obligation to explain how and when the objectives of the Plan have been or will be achieved.



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

APR 16 1985

Mr. J. Dexter Peach, Director
Resources, Community and Economic
Development Division
U.S. General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Peach:

We appreciate the opportunity to comment on the draft GAO Report, "The Three Mile Island Action Plan: No Longer A Measure Of Nuclear Plant Safety Improvements." The report makes some points which are useful to the Nuclear Regulatory Commission and highlights areas in which work by the Commission may be desirable. However, we have limited our comments to facts that should be corrected or clarified. Comments on the conclusions and recommendation have been withheld until we receive the final report. Most of the numerous statistics could not be verified because the identity and status of individual issues were not provided and because of the limited time available for this response. Specific comments on the factual information in the report are enclosed.

Sincerely,


William J. Dircks
Executive Director for Operations

Enclosure:
Specific Comments on Draft GAO
Report, "The Three Mile Island
Action Plan: No Longer A Measure
of Nuclear Plant Safety Improvements"

ENCLOSURESPECIFIC COMMENTS ON DRAFT GAO REPORT, "THE
THREE MILE ISLAND ACTION PLAN: NO LONGER A
MEASURE OF NUCLEAR PLANT SAFETY IMPROVEMENT"NRC RESPONSE¹1. Cover Summary

". . . the Nuclear Regulatory Commission prepared an Action Plan consisting of 176 items . . ."

GAO uses "176 items" in its summary and extensively throughout its report. We have made the assumption that this number was extracted from Table B.3 of NUREG-0660 [the May 1980 Action Plan]. However, as GAO is aware, several of these items were subdivided into multiple actions, all of which were treated as separate items by the NRC. This subdivision was recognized by GAO and corroborated by the total number of questionnaires submitted to NRC in January 1984. The number of items resulting from the Action Plan and listed in Tables II and III of NUREG-0933 [Prioritization of Generic Safety Issues, December 31, 1984] is 352.

3. p. i, Digest²

". . . a comprehensive list of 176 items . . ."

As stated in Comment 1 above, the comprehensive list of Action Plan items is greater than 176.

[GAO COMMENT: NRC is correct that the 176 items used in our report are the items listed in NUREG-0660, NRC Action Plan Developed as a Result of the TMI-2 Accident, dated May 1980. As stated by NRC and described in our report on page 4, these items were later subdivided by the NRC staff into more manageable parts for implementation. Each part was tracked in NRC's quarterly Action Plan Tracking System report and, for utility tasks, NRC's monthly Operating Reactor Licensing Actions Summary report. We

¹Where appropriate, we have combined related NRC responses and provided a consolidated comment.

²NRC's references to page numbers in the draft report have been changed to reflect the pagination of the final report.

used the August and October 1983 issues of these reports, respectively, to identify Action Plan tasks for our review. The 352 items mentioned by NRC do not represent additional items but represent the NRC staff's subdivisions of the 176 Action Plan items as of December 1984.]

NRC RESPONSE

2. Cover Summary

". . . NRC is moving away from tracking Action Plan items and is losing its ability to account for implementation of the Plan. . . ."

NRC has not moved away from tracking Action Plan items and is not losing its ability to account for implementation of the Plan. All items that were clarified in NUREG-0737 [Clarification of TMI Action Plan Requirements, November 1980] and scheduled for implementation are being tracked and accounted for in NUREG-0748 [Operating Reactors Licensing Action Summary]. Additional monitoring and reporting of the inspection of implementation of these NUREG-0737 items is continually being done on a plant-specific basis in the IE [Office of Inspection and Enforcement] TMI Action Plan Tracking System. In June 1983, NRC completed a reassessment of all Action Plan items that were not clarified in NUREG-0737. All items that were still under development at that time were prioritized using probabilistic risk assessment techniques. The results of this effort were reported in NUREG-0933 [Prioritization of Generic Issues, November 1983]. The active items (high-priority, medium-priority, and nearly-resolved items) identified by the prioritization process were entered into the Generic Issue Management Control System (GIMCS) for tracking of their resolution. Any implementation of licensee actions that result is tracked in NUREG-0748. All other items that were identified as resolved, low-priority, drop-priority, or covered in other items are accounted for in NUREG-0933. A summary of the status of all Action Plan items is shown in Table II of NUREG-0933 which is updated and published every six months. Therefore, although a separate tracking of items in the Action Plan Tracking System has been discontinued, all TMI items are listed in NUREG-0933 and are tracked in NUREG-0748 or GIMCS, depending on their status.

5. p. ii, Digest

". . . NRC also no longer measures utilities' progress on all requirements or its own progress against the Action Plan. . . ."

As stated before in Comment 2 above, NRC continues to measure utilities' progress in implementing all requirements resulting from the Action Plan in NUREG-0748 (Table Y). NRC's progress in resolving the remaining Action Plan items is measured in GIMCS.

9. p. iv, NRC Is Not Accounting For Action Plan Progress

"NRC has not, however, explicitly stated that the Action Plan has been replaced."

As GAO currently states, the merging of Action Plan items with generic issues from other sources into one management system was done to permit NRC to focus on the most important safety issues, without regard to their origin. However, it is erroneous for GAO to imply that the Action Plan has been replaced. Action Plan items clarified in NUREG-0737 continue to be vigorously pursued with progress tracked in NUREG-0748. The identity of these items as TMI Action items is being maintained. Those remaining items that warranted resolution were identified by the prioritization process of NUREG-0933 with progress on their resolution tracked in GIMCS. All high-priority, medium-priority, and nearly-resolved Action Plan items continue to maintain their original identification numbers as their resolution is being pursued. As stated in the TMI Action Plan "it is not intended to be inviolable - changes in the specified actions will be made as necessary to reflect new information."

[GAO COMMENT: NRC is correct in noting that various systems have been installed to track the items in the Action Plan. We believe, however, our assessment that NRC is moving away from tracking Action Plan items and is unable to account for implementation of the Plan is accurate for two basic reasons.

First, the tracking systems described by NRC do not provide a readily available explanation of the progress that NRC and utilities are making on the 176 individual items listed in the Action Plan. For example, one cannot determine from these systems the reason why a high priority Action Plan item originally scheduled to be completed by January 1985 is not yet complete. In addition, NRC's systems show that specific Action Plan-related tasks have been incorporated into other NRC programs, such as the Human Factors Program, but the systems do not show if work on the tasks is progressing in accordance with NRC's original completion schedules for the tasks.

Second, for Action Plan tasks that utilities are implementing, NRC's tracking system (NUREG-0748) may show a task as "complete" at all applicable plants but the applicable utilities may

not have actually made all of the appropriate changes at their plants. As discussed in our report on page 27, NRC considers a utility task "complete" when it reaches agreement with the utility on the specific action the utility will take to accomplish the particular task. The only way to determine, from NRC's tracking systems, if a utility has satisfactorily accomplished a particular Action Plan-related task is to examine NRC's Office of Inspection and Enforcement Action Plan tracking system to determine whether or not that system shows that the task has been inspected and, if inspected, has been approved.

The concern that NRC is losing its ability to determine the status of individual Action Plan items was underscored by an exchange between the NRC Chairman and members of the NRC staff during an April 5, 1984, briefing on the status of the Action Plan. At that briefing the chief of NRC's Safety Program Evaluation Branch acknowledged, in response to the Chairman's question, that ". . . things are starting to get mixed up" as Action Plan issues are slowly being combined with other safety issues NRC is working on. The salient portions of this briefing are presented as appendix IX of this report. (See p. 91.)

Regarding NRC's comment that it is erroneous for us to imply that the Action Plan has been replaced, NRC's Safety Program Evaluation Branch Chief also stated at the April 1984 briefing that the ". . . Action Plan items are going to disappear, and they're going to be incorporated into more general things. We're no longer focusing just on the Action Plan." (See app. IX, p. 91).]

NRC RESPONSE

4. p. i, Digest

". . . NRC, however, does not plan to complete 20 of the Action Plan tasks, . . ."

This statement should be clarified to read ". . . NRC, however, does not plan to resolve 20 of the Action Plan items since they were identified as low-priority or drop in NUREG-0933."

[GAO COMMENT: NRC uses the term "resolved" to mean that ". . . a solution to the problem [Action Plan item] has been identified and has gone through all the necessary approval steps." Since NRC indicated that it does not plan to identify and obtain approval of solutions to the 20 Action Plan items, we believe it correct to say that NRC does not plan to complete the 20 items.]

NRC RESPONSE

6. p. ii, Status of the Action Plan

"The Action Plan assigned utilities responsibility for implementing 39 items. . . ."

"The NRC staff was to complete 120 Action Plan items . . . It broke these items down in 222 separate tasks. . . ."

NRC accounting shows that 94 items requiring utility action were listed in NUREG-0737. The remaining tasks were broken down into 258 separate items and were assigned to the NRC staff for resolution.

12. p. 4, Methodology for Evaluating Items Requiring NRC Staff Action

"The NRC staff divided these 120 items--called developmental items--into 222 separate tasks."

Excluding items clarified in NUREG-0737, NRC divided the remaining tasks into 258 separate items.

[GAO COMMENT: When we initiated our review in September 1983, NRC was using two documents to provide information on the implementation of the Action Plan: (1) NUREG-0748, "Operating Reactors Licensing Actions Summary," which tracks utilities' progress on the tasks that NRC directed them to implement when it issued its Clarification of TMI Action Plan Requirements, NUREG-0737, November 1980, and (2) the Action Plan Tracking System, which listed all utility and NRC tasks or subdivisions of 159 of the 176 Action Plan items. The remaining 17 of the 176 Action Plan items were the responsibility of the NRC Commissioners and were not included in either document.

These documents listed 131 tasks (subdivisions) requiring utility implementation, each with its own implementation schedule, and 222 tasks (subdivisions) requiring NRC staff efforts. These tasks emanated from 39 and 120 distinct items, respectively, identified in the May 1980 Action Plan. In its comments on the report, NRC recognized that subdivisions of the Action Plan became our basis for preparing and distributing questionnaires to utilities (on December 3, 1983) and to the NRC staff (on January 11, 1984).

The difference between the numbers used by GAO and discussed by NRC in its comments is explained by the fact that NRC has subdivided the Action Plan items in different ways at different times. The problem of counting the number of subdivisions of the 176 items contained in the Action Plan is not new. In the briefing before the Commissioners on April 5, 1984, the following dialogue took place between the Chief, Safety Program Evaluation Branch, and the Chairman of the Commission:

"Chief: . . . This slide is a summary of the status of all the TMI Action Plan items . . .

- - - -

Chairman: I thought [NUREG] 0737 had more than 63 items.

Chief: There's always a problem with that Mr. Chairman. It's how you count them because they're broken down into subgroups. But for our accounting purposes and the headings we took it was 63. You can get different count numbers depending on how you do it . . . (Emphasis added.)

- - - -

Chairman: I can appreciate that but it could be desirable, I believe, to have one common base so that we don't have to always try to juggle the numbers. . . ."

As stated on page 4 of our report, the November 1980 Clarification of TMI Action Plan Requirements (NUREG-0737) listed 142 tasks utilities were responsible for implementing, of which NRC began tracking utility progress on 131. When this April 1984 briefing occurred, however, the NRC staff counted 63 Action Plan subdivisions for utility action under NUREG-0737 and another 192 subdivisions requiring NRC staff effort. By January 1985, however, the NRC staff had changed its count to 94 utility actions under NUREG-0737 and 258 other actions requiring NRC staff effort.

We believe that our report accurately presents our methodology and basis for selecting Action Plan tasks for review. The fact that NRC has subsequently combined some tasks and/or made additional subdivisions of tasks does not affect or change the information in our report regarding the status of the Action Plan as of June 1984.]

NRC RESPONSE

7. p. iii, NRC Staff Progress

". . . the NRC staff has completed 122, or 55 percent, of the 222 individual tasks. It is working on 69 tasks and has suspended work on the other 31 tasks . . ."

". . . 37 completed tasks took an average of 13 months longer than scheduled in the Action Plan. In addition, NRC estimates that seven incomplete tasks will slip from 3 to 60 months with an average delay of about 3 years."

According to NRC accounting in December 1984, of the 352 individual items, 35 are in the process of resolution, 94 items resulted in requirements that were clarified by

NUREG-0737, 61 items are covered in other issues, 140 items were resolved with either new requirements or no new requirements, 13 are low-priority items, 7 are drop items, and 2 items are being prioritized.

GAO needs to identify the 44 items with schedule slippages so that NRC can verify the accuracy of the GAO accounting.

[GAO COMMENT: As discussed previously, GAO's count of subdivisions of the 176 Action Plan items is based on NRC's Action Plan tracking systems as of September 1983. NRC's count of 352 items, however, is based on its December 1984 subdivisions of the Action Plan, which in turn differs from its own count of 255 items in its November 1983 Prioritization of General Issues and in its June 1984 update of that document. Therefore, any accounting difference that exists between the number of items identified by GAO and NRC is because of NRC's changes in subdividing and accounting for items made after GAO prepared and distributed its questionnaires based on NRC's records as of September 1983.

The 44 subdivisions with schedule slippages were based on information provided by NRC staff in response to our questionnaires. To identify which items have slippages would abrogate the pledge of confidentiality we made in distributing our questionnaires. We obtained permission from respondents when we made specific reference in the report to information contained in individual completed questionnaires.]

NRC RESPONSE

8. p. iv, NRR is not Accounting for Action Plan Progress

". . . NRC has included little information on the Action Plan in its annual report."

In its November 1984 response to the GAO report, "Management Weaknesses Affect Nuclear Regulatory Commission Efforts to Address Safety Issues Common to Nuclear Power Plants," NRC made a commitment to include in its FY 1984 Annual Report summary tables of the total number of all generic safety issues identified, prioritized, and resolved. A list of all of the issues, including TMI Action Plan items, will also be included in the report.

10. p. iv, Conclusions

". . . GAO believes that NRC should publicly account for the accomplishments on the Plan to date and formally close out the Action Plan by showing if and how incomplete tasks will be pursued under the new management system."

NRC has publicly accounted for accomplishments on the Plan with NUREG-0933 and NUREG-0748. These documents are updated at frequent intervals to reflect the status of the Action Plan and are available to the public.

[GAO COMMENT: GAO agrees that NRC has made information available to the public regarding the Action Plan. We believe, however, that providing meaningful information on progress in completing the Action Plan requires more than listing the items in various documents, subdividing them in different ways, and showing how some items have been incorporated into other NRC programs, as NRC has done. It requires reporting on the 176 Action Plan items, including achievements to date, the status of those items that remain incomplete, expected completion dates, and reasons for major deviations from original schedules. This information is not available in NRC's tracking systems and, on the basis of NRC's comments, it does not appear that NRC will include all of this information in its Annual Reports.]

NRC RESPONSE

11. p. 4, Objectives, Scope, and Methodology

"We conducted our audit work from September 1983 to June 1984."

Almost a year has passed since GAO completed its audit work and a lot has been accomplished on the Action Plan by NRC since that time. In order to prevent any misinterpretation of the current status of the Action Plan, GAO should state in its title the cut-off date used for its report, particularly since the report further states (p. 33) that "The accident occurred 6 years ago . . ."

[GAO COMMENT: GAO has noted in the appropriate sections of the report that our audit work was completed in June 1984.]

NRC RESPONSE

13. pp. 7, 8, Methodology For Evaluating Items Requiring NRC Staff Action

"To obtain complete and candid responses we stated in the questionnaire that answers would be strictly confidential and used only for the purposes of this review. . . . The Director of the Division of Safety Technology, Office of Nuclear Reactor Regulation, however, had managers and the Planning and Program Analysis staff review the staff responses to the 111 questionnaires assigned to that office."

These statements omit the fact that the Chief of the Safety Program Evaluation Branch discussed with GAO staff the managerial review of responses prior to their return to GAO. Thus, this approach was undertaken by NRC with the full knowledge and consent of GAO. NRC believes that this action did not compromise confidentiality; rather, the responses were strengthened, where necessary, by the inclusion of information found lacking during the managerial review.

[GAO COMMENT: This approach was not taken with the full knowledge and consent of GAO. We delivered the NRC questionnaires on January 11, 1984. In mid-February 1984 we became concerned because about one half of the questionnaires had not been returned to us. We inquired about their status and were informed by the Chief of the Safety Program Evaluation Branch that the Division of Safety Technology staff responses were being reviewed by Division management. Until this time GAO was not aware that NRC was using this review procedure. Recognizing that the confidentiality of the questionnaires had already been breached, we asked that the Division finish its review and return them to us. It is important to note that we had provided self-addressed envelopes for each questionnaire, placed a confidentiality pledge in the questionnaire, and specifically requested that it be returned directly to us by the NRC staff member assigned to complete the questionnaire. To our knowledge no other management group within NRC reviewed the staff responses in this manner.]

NRC RESPONSE

14. p. 11, Completing Many Actions Did Not Require Plant Changes

". . . a system that would automatically turn on the reactor coolant pumps . . ." should be changed to read ". . . a system that would automatically turn off the reactor coolant pumps . . ."

". . . because, under certain circumstances, automatically turning on these pumps could contribute to the risk of reactor damage." is incorrect and should be deleted entirely.

". . . when the pumps should be turned on." should be changed to read ". . . when the pumps should be turned off."

[GAO COMMENT: The final report has been revised as indicated by NRC except the reference to potential reactor damage. This assessment was derived from the industry study.]

NRC RESPONSE15. p. 15, NRC Staff Implementation of the Action Plan

". . . NRC did not apply new regulatory requirements based on these completed tasks to existing plants."

It is unclear what GAO means by "new." As stated to GAO, no new requirements beyond those identified in NUREG-0737 (including Supplement 1) were necessary since NRC believes that the necessary requirements were addressed in NUREG-0737 and its supplement.

[GAO COMMENT: By "new" requirements we meant that, at the time we finished our audit work, completion of developmental tasks by the NRC staff had not led to the subsequent development and application of new regulatory requirements to any of the 65 nuclear plants licensed to operate when the Three Mile Island accident occurred. As indicated by NRC in comment number 7, however, 140 of its December 1984 subdivisions of the Action Plan were resolved with either "new requirements" or "no new requirements." We changed our report (see p. 15) to reflect this information.]

NRC RESPONSE16. p. 16, Many Tasks Have Not Been Completed As Originally Planned

The completed and active priority 1 tasks should be identified by GAO so that the accuracy of the GAO report could be verified.

[GAO COMMENT: As stated previously providing this information on specific subdivisions of the Action Plan items would abrogate the pledge of confidentiality provided to the NRC staff in our questionnaires. However, appendix VIII of the report lists the high priority developmental Action Plan items, from which the subject tasks were derived, that are incomplete based on questionnaire responses indicating that one or more tasks derived from the items were incomplete as of June 1984.]

NRC RESPONSE17. p. 19, Commission Implementation Of The Action Plan

"In terms of the specific actions required by the revised Action Plan, NRC believes, and we agree, that 16 of the 17 items are complete."

Further study leads us now to conclude that the three parts of the item, "Study the Need for TMI-Related Legislation," have been completed. See Comments 22, 23, and 24 below.

[GAO COMMENT: See GAO's response to NRC comments 22, 23, and 24. At the time of our review this item was incomplete. Wording changes have been made in the appropriate sections of the report, however, to reflect NRC's current position that this item is complete.]

NRC RESPONSE

18. pp. 21, Tasks Completed But Related Changes Not Made

"For example, the assertion that NRC had not articulated a substantive safety standard or policy . . ."

In formulating the original TMI Action Plan, the development of safety goals for nuclear power plants was referred to as "further delineation of substantive safety policy." The draft report, as well as many of the earlier NRC documents, refers to the work as "developing a safety goals policy" or "developing safety goals for nuclear power plants." NRC's "safety policy" includes a spectrum of policy considerations, e.g., backfitting policy, severe accident policy. Accordingly, we suggest insertion of the word "goals" after "safety" in the second line from the bottom of page 21, and in the third and (especially) eighth lines from the top of page 21.

[GAO COMMENT: As NRC notes, the specific task in the Action Plan stated "safety policy." Accordingly, we have not changed the report as suggested by NRC. To reflect NRC's concern, however, we have added a footnote to page 21.]

NRC RESPONSE

19. p. 22, Improve Public Participation In The Hearing Process

"We were informed by the Commission's Office of Program Evaluation . . ." should be changed to read, "We were informed by the Commission's Office of Policy Evaluation . . ."

[GAO COMMENT: This title has been changed.]

NRC RESPONSE

20. p. 23, Study The Need To Establish An Independent Nuclear Safety Board

At the end of the discussion of the need for an independent nuclear safety board, it might be appropriate to refer to the 1984 NRC Authorization Act which requested NRC to reexamine the concept (often referred to as the National Transportation Safety Board concept). A report of a study of the concept by Brookhaven National Laboratory has been published and the issue is currently under active consideration. See, e.g., letter of March 13, 1985, from ACRS to the Chairman.

[GAO COMMENT: NRC's comments have been reflected in the report.]

NRC RESPONSE

21. p. 24, The Incomplete Item

The discussion of NRC authority to issue licensing amendments without mandatory public hearings should note that enactment of the so-called "Sholly Amendment," Section 12 of Public Law 97-415 (January 4, 1983) clarified this authority under Sec. 189a of the Atomic Energy Act of 1984 as amended.

[GAO COMMENT: The report has been changed to reflect this legislation.]

NRC RESPONSE

22. p. 25, The Incomplete Item

". . . provisions of the Price-Anderson act . . ."

Part of the Price-Anderson Act consideration (need for TMI-related legislation) was a reexamination of the definition of an "Extraordinary Nuclear Occurrence" (ENO). The Commission has recently issued for public comment a revised statement of the criteria to be used in determining when a nuclear accident should be considered an ENO. It may be useful to indicate this by adding a sentence to the end of the final paragraph on page 25.

[GAO COMMENT: The report has been changed to include this information.]

NRC RESPONSE

23. p. 25, The Incomplete Item

"--determining NRC's legal authority to conduct cleanup activities at a nuclear facility."

"--assessing the need for a new category of licenses to be issued for a facility during an extended recovery period following a major accident."

As noted, the Action Plan called for consideration of: (1) NRC's legal authority to conduct cleanup activities, the federal government's liability for damages during cleanup, and entitlement to reimbursement for cleanup costs, and (2) the need for a new category of license for facilities following a major accident. The experience gained in response to the TMI-2 accident confirms our 1980 views that no legislative action is necessary and future actions should be on an as-needed basis. We have found adequate regulatory authority to modify 10 CFR Part 50 licenses in order to assure the safety and timeliness of the various cleanup activities. If future experience shows that NRC's authority is insufficient to assure the safety and timeliness of the cleanup operations, we will take steps to secure the necessary additional authority. Accordingly, we consider this item of the Action Plan as completed.

[GAO COMMENT: The report has been changed to reflect NRC's position.]

NRC RESPONSE

24. p. 25, The Incomplete Item

"--assessing the need for a new or modified NRC authority to address the establishment of a chartered national company to operate nuclear power plants. . . . the Office of Policy Evaluation pointed out that this item had not yet been completed."

The TMI Action Plan stated, "The Commission will study the need for legislation with respect to . . ." As OPE noted in its memorandum of May 18, 1984, to the Commission, the General Counsel advised the Commission (SECY-80-366, August 5, 1980, at page 4) that action should be deferred "until a need . . . could be established." We believe this communication should be cited.

In addition, it may be appropriate to note that the issue of the potential value of a national operating company or consortium was raised by one of the Commissioners in 1983 (in the general context of legislation then being considered by the Congress to reform the Public Utility Holding Company Act of 1935). On June 23, 1983, OPE forwarded an analysis and comments on the proposed legislation and its relevance to improving nuclear safety through better integration of

the nuclear industry. The value of an industry-wide consortium or public corporation in facilitating efforts to improve nuclear power plant safety was discussed and the possibility raised of proposing suitable language to be included in the Holding Company Act reform legislation under consideration in Congress. The Commission took no formal action in response to the OPE memorandum; however, there appeared to be a consensus that the issue required much more NRC and industry analysis and evaluation before any specific legislative action could be proposed. In view of this, we would consider this item completed as far as the action plan is concerned.

[GAO COMMENT: We revised the report to reflect NRC's comments and its position that the item is complete.]

NRC RESPONSE

25. p. 32, NRC Merged Management of Action Plan Tasks with Other Generic Issues

Footnote 3 should be expanded to include issues that were scheduled for ranking.

[GAO COMMENT: We changed the footnote as NRC suggested.]

SAMPLING METHODOLOGY FOR UTILITY ACTIONS

The Action Plan required each of the nation's 65 operating power plants to implement improvement actions in areas such as operational safety and emergency preparedness. Because there are different types of nuclear power plants, all actions were not required at each plant. Tasks applicable to power plants ranged from 70 for 1 plant to 96 at several plants, with a total of 6,004 separate actions required for all 65 plants. In an effort to minimize utility reporting burdens, we developed a stratified random sample that would allow us to sample the status of all 6,004 actions and make projections with a 95-percent level of confidence.

We divided the 6,004 specific power plant actions into 11 groups of requirements on the basis of their priority, subject area, and the following NRC classifications:

- approved for implementation apart from the Action Plan;
- approved for implementation as described in the Action Plan; or
- requiring further definition of scope, need, and criteria.

Once the sample groups were determined, specific actions from the groups were randomly assigned to power plants that were subject to those requirements. No power plant was requested to report on more than 15 actions because we did not want to burden utilities in completing our questionnaires. This sampling approach allowed us to select actions applicable to all 65 power plants.

We received 648 questionnaire responses from 51 power plants. Since the questionnaire responses were the basis for projecting the status of the Action Plan, we had to reduce the universe of required actions from 6,004 at 65 plants to 4,579 at 51 plants. Using this universe as our basis, we then calculated all projections at the 95-percent confidence level using the appropriate statistical formulas. The following presents the sampling errors for the projections listed in chapter 2 of our report.

Completed Actions Requiring No Change (p. 11)

| <u>Required actions</u> | <u>Projected actions</u> | <u>Sampling error</u> | <u>Range</u> | |
|-------------------------|--------------------------|-----------------------|--------------|-------------|
| | | | <u>Low</u> | <u>High</u> |
| 4,579 | 707 | 118 | 589 | 825 |

Actions Not Completed on Schedule (p. 12)

| <u>Required actions</u> | <u>Projected actions</u> | <u>Sampling error</u> | <u>Range</u> | |
|-----------------------------|------------------------------|---------------------------|--------------|-------------|
| | | | <u>Low</u> | <u>High</u> |
| 4,579 | 771 | 129 | 642 | 900 |

Incomplete Actions (p. 12)

| <u>Priority</u> | <u>Required actions</u> | <u>Projected actions</u> | <u>Sampling error</u> | <u>Range</u> | |
|-----------------|-----------------------------|------------------------------|---------------------------|--------------|-------------|
| | | | | <u>Low</u> | <u>High</u> |
| 1 | 3,728 | 658 | 116 | 542 | 774 |
| 2 | 648 | 75 | 28 | 47 | 103 |
| 3 | <u>203</u> | <u>21</u> | 12 | 9 | 33 |
| Total | <u>4,579</u> | <u>754</u> | 120 | 634 | 874 |

Completed Actions (p. 26)

| <u>Priority</u> | <u>Required actions</u> | <u>Projected actions</u> | <u>Sampling error</u> | <u>Range</u> | |
|-----------------|-----------------------------|------------------------------|---------------------------|--------------|-------------|
| | | | | <u>Low</u> | <u>High</u> |
| 1 | 3,728 | 3,070 | 116 | 2,954 | 3,186 |
| 2 | 648 | 573 | 28 | 545 | 601 |
| 3 | <u>203</u> | <u>182</u> | 12 | 170 | 194 |
| Total | <u>4,579</u> | <u>3,825</u> | 120 | 3,705 | 3,945 |

POWER PLANT QUESTIONNAIRE
WITH SUMMARY OF RESPONSES



IMPORTANT!
Official Government
Business

U.S. GENERAL ACCOUNTING OFFICE

REVIEW OF NRC'S IMPLEMENTATION OF THE TMI ACTION PLAN

INTRODUCTION

The purpose of this questionnaire is to obtain information from electric utilities that own and operate nuclear powerplants about the extent of changes being made in improving the operation of nuclear powerplants following the March 1979 accident at Three Mile Island (TMI). The results will be used by the U.S. General Accounting Office, an agency of the Congress, in reporting on the Nuclear Regulatory Commission's (NRC's) efforts to implement its 1980 plan to improve the regulation and operation of nuclear powerplants. This plan is frequently called the TMI Action Plan.

Your answers are strictly confidential and will be used only for the purpose of this study. Although this questionnaire may take some time to complete, we hope that you will understand that your answers are extremely important. We believe that Congress is very interested in knowing the value and number of changes in the regulation and operation of nuclear powerplants that have been made since the TMI accident.

In order to study these changes, we statistically sampled items identified by NRC as applicable to your powerplant. The NRC document "Clarification of TMI Action Plan Requirements (NUREG 0737)" describes the items and provides estimated completion dates. In some instances, items have several parts. For example, in NUREG 0737, item II.B.2, Plant Shielding is shown as having three parts:

- II.B.2.1-Plant Shielding-Review Designs
- II.B.2.2-Plant Shielding-Plant Modification
- II.B.2.3-Plant Shielding-Equipment Qualification

For purposes of completing this questionnaire, each of these parts should be considered an item. Complete the questionnaire for only the item shown on the questionnaire label. Therefore, you could complete a questionnaire for item II.B.2.1 (Plant Shielding-Review Designs) and not item II.B.2.2 (Plant Shielding-Plant Modification) or item II.B.2.3 (Plant Shielding-Equipment Qualification).

Most of the questions can be completed by filling in blanks or checking boxes. There is space available for any comments you may wish to add. Also, representatives of the General Accounting Office will visit a small number of nuclear powerplants to obtain more detailed information on the extent of changes being made.

Please return the completed questionnaire in the self-addressed envelope within 4 weeks after receipt. The questionnaire is numbered so that we can delete your name from our list when we receive your completed questionnaire(s) and, thus, avoid sending you an unnecessary follow-up request. In addition, your answers will be combined so that nobody will be able to tell how you or any other company answered a given question.

If you have any questions, please call either Darryl L. Wittenburg or Michael R. Keppel in our Pittsburgh Office at (412) 644-5903. Thank you for your cooperation.

If the self-addressed envelope is misplaced, please mail the completed questionnaire(s) to:

Mr. Michael R. Keppel
 U.S. General Accounting Office
 445 Fort Pitt Boulevard-Suite 310
 Pittsburgh, PA 15219

Below are two labels. The first label identifies the powerplant and the operating utility company for which this questionnaire is intended. The second label indicates the particular NUREG 0737 item for which we seek status information. Complete this questionnaire for this specific item at this powerplant.

POWERPLANT NAME

OPERATING UTILITY
COMPANY NAME

*****ITEM IDENTIFICATION LABEL*****

PLEASE COMPLETE THIS QUESTIONNAIRE ON THE FOLLOWING ACTION PLAN ITEM

ACTION PLAN ITEM NUMBER

ACTION PLAN ITEM TITLE

NUREG 0737 ESTIMATED
COMPLETION DATE

1. Has the NRC Office of Nuclear Reactor Regulation closed the item shown in the Item Identification Label on Page 2 at your powerplant? By closed we mean that the NRC Office of Nuclear Reactor Regulation has agreed that your method for meeting the NUREG 0737 requirement for this item at your powerplant is acceptable. (CHECK ONE.)

346-(2386)¹

- 1. Yes.....CONTINUE TO QUESTION 2
268-(1924)
- 2. No.....SKIP TO QUESTION 3
21-(170)
- 3. Not Applicable...SKIP TO QUESTION 3
No Response 13-(99)

2. On what date did the NRC Office of Nuclear Reactor Regulation close this item at your powerplant?

 /
MONTH/YEAR

3. On what date was or will the NUREG 0737 requirement for this item be met at your powerplant? Meeting the NUREG 0737 requirement means that your utility believes the requirement for this item has been completely fulfilled. It is not necessary for the NRC Office of Nuclear Reactor Regulation to have closed the item for your utility to have met the NUREG 0737 requirement.

 /
MONTH/YEAR

4. Which of the following statements is true for this item at your powerplant? (CHECK ONE.)

- 1. Item requirement was met by or before the NUREG 0737 estimated completion date (See Item Identification Label On Page 2)...SKIP TO QUESTION 8A
294-(1914)
- 2. Item requirement was met after the NUREG 0737 estimated completion date (See Item Identification Label On Page 2)...CONTINUE TO QUESTION 5
113-(328)
- 3. NUREG 0737 requirement is not yet met...CONTINUE TO QUESTION 5
45-(296)

Item was met but did not have an estimated completion date. 49-(376)

Item is not yet met and did not have an estimated completion date. 55-(458)

Item was not appropriate for power plant implementation. 92-(707)

¹The results of this questionnaire are presented using two numbers: The first number represents the number of questionnaires providing the indicated response. The second number (in parentheses) represents our projection of this response at a 95-percent confidence level.

5. Question 5 to Question 7 address reasons which may or may not have delayed your powerplant in meeting the NUREG 0737 requirement(s) for this item. Question 5 examines reasons pertaining to NRC, Question 6 examines reasons pertaining to your utility, and Question 7 examines other reasons. Whether or not the NRC requirement has been met, please provide your opinion on the extent to which each of the specific reasons shown contributed to the delay.

PLEASE READ THE REASONS LISTED IN QUESTION 5 TO QUESTION 7 BEFORE COMPLETING THESE QUESTIONS.

How much impact (if any) did each of the following reasons pertaining to NRC have in delaying your powerplant from meeting the NUREG 0737 requirement for this item? (SEE ITEM IDENTIFICATION LABEL ON PAGE 2 FOR ESTIMATED COMPLETION DATE. FOR EACH REASON CHECK ONE COLUMN.)

| DELAY REASONS PERTAINING TO NRC | HOW MUCH OF AN IMPACT? | | | | | | No Response |
|---|------------------------|-------------------|--------------------|-----------------|----------------------|-------------------|----------------|
| | No Impact | Minimal Impact | Moderate Impact | Great Impact | Very Great Impact | Not Applicable | |
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| 1. Feasibility of NRC's NUREG 0737 estimated completion date | 12 (95) | 12 (74) | 27 (198) | 43 (319) | 35 (227) | 7 (41) | 22 (171) |
| 2. Clarity of NRC's technical requirements | 21 (164) | 31 (246) | 38 (257) | 26 (170) | 14 (71) | 7 (48) | 21 (168) |
| 3. Specificity of NRC's technical requirements | 26 (186) | 29 (232) | 27 (200) | 32 (195) | 16 (95) | 7 (48) | 21 (168) |
| 4. Appropriateness of NRC's technical requirements | 32 (252) | 33 (230) | 33 (230) | 18 (102) | 14 (99) | 8 (54) | 20 (158) |
| 5. Feasibility of NRC's technical requirements | 31 (226) | 35 (262) | 23 (164) | 30 (182) | 10 (66) | 8 (57) | 21 (168) |
| 6. Changes and/or supplements to the original NUREG 0737 requirements for this item | 35 (287) | 25 (197) | 25 (174) | 18 (79) | 22 (140) | 12 (79) | 21 (168) |

QUESTION 5 CONTINUES ON THE NEXT PAGE

CONTINUATION OF QUESTION 5

| DELAY REASONS PERTAINING TO NRC | HOW MUCH OF AN IMPACT? | | | | | | No Response |
|--|------------------------|------------------------|-------------------------|----------------------|---------------------------|------------------------|----------------|
| | No Impact 1 | Minimal Impact 2 | Moderate Impact 3 | Great Impact 4 | Very Great Impact 5 | Not Applicable 6 | |
| 7. Integration of this item requirement with other NRC requirements | 29 (235) | 32 (231) | 21 (139) | 18 (122) | 28 (168) | 9 (61) | 21 (168) |
| 8. Timeliness of NRC's review(s) of the utility's proposed design or analysis | 31 (229) | 30 (235) | 13 (105) | 17 (101) | 14 (91) | 31 (185) | 22 (178) |
| 9. Timeliness of NRC's review/ approval of the utility's proposed implementation method | 34 (250) | 23 (186) | 17 (115) | 10 (58) | 15 (87) | 37 (249) | 22 (178) |
| 10. Timeliness of NRC's review/ approval of the utility's proposed technical deviation (from NUREG 0737 requirement) | 42 (321) | 13 (105) | 8 (58) | 10 (59) | 15 (77) | 48 (327) | 22 (178) |
| 11. Other(SPECIFY) | 1 (10) | 0 | 0 | 0 | 3 (26) | 1 (9) | 153 (1080) |
| 12. Other(SPECIFY) | 1 (10) | 0 | 0 | 0 | 0 | 1 (9) | 156 (1106) |

6. How much impact (if any) did each of the following reasons pertaining to your utility have in delaying your powerplant from meeting the NUREG 0737 requirement for this item? (SEE ITEM IDENTIFICATION LABEL ON PAGE 2 FOR ESTIMATED COMPLETION DATE. FOR EACH REASON CHECK ONE COLUMN.)

| DELAY REASONS PERTAINING TO YOUR UTILITY | HOW MUCH OF AN IMPACT? | | | | | | No Response |
|---|------------------------|-------------------|--------------------|-----------------|----------------------|-------------------|----------------|
| | No Impact | Minimal Impact | Moderate Impact | Great Impact | Very Great Impact | Not Applicable | |
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| 1. Availability of required personnel | 27 (234) | 26 (175) | 41 (281) | 24 (158) | 14 (74) | 5 (34) | 21 (168) |
| 2. Complexity of design modification | 21 (176) | 24 (156) | 27 (206) | 30 (171) | 10 (54) | 25 (193) | 21 (168) |
| 3. Concurrent or simultaneous meeting of interrelated NUREG 0737 item requirements | 25 (198) | 29 (211) | 24 (170) | 29 (198) | 20 (109) | 10 (70) | 21 (168) |
| 4. Time required for pre-operational testing | 36 (297) | 29 (168) | 12 (81) | 6 (24) | 7 (36) | 47 (350) | 21 (168) |
| 5. Time required for staff training | 33 (273) | 31 (208) | 19 (106) | 12 (61) | 8 (47) | 34 (261) | 21 (168) |
| 6. Scheduling of item implementing activities to coordinate with powerplant shutdown(s) | 37 (255) | 8 (58) | 16 (117) | 25 (142) | 16 (106) | 35 (278) | 21 (168) |
| 7. Other(SPECIFY) | 0 | 0 | 0 | 0 | 3 (29) | 1 (9) | 154 (1087) |
| 8. Other(SPECIFY) | 0 | 0 | 1 (9) | 0 | 0 | 1 (9) | 156 (1107) |

7. How much impact (if any) did each of the following other reasons have in delaying your powerplant from meeting the NUREG 0737 requirement for this item? (SEE ITEM IDENTIFICATION LABEL ON PAGE 2 FOR ESTIMATED COMPLETION DATE. FOR EACH REASON CHECK ONE COLUMN.)

| OTHER DELAY REASONS | HOW MUCH OF AN IMPACT? | | | | | | No Response |
|---|------------------------|---------------------|----------------------|-------------------|------------------------|---------------------|---------------|
| | No Impact 1 | Minimal Impact 2 | Moderate Impact 3 | Great Impact 4 | Very Great Impact 5 | Not Applicable 6 | |
| 1. A generic technical analysis is/was required prior to powerplant specific analysis | 35 (249) | 11 (73) | 14 (96) | 19 (154) | 20 (172) | 38 (212) | 21 (168) |
| 2. Powerplant specific analysis is/was required by outside groups; i.e., reactor manufacturer or architect-engineering firm | 39 (272) | 14 (93) | 21 (157) | 19 (134) | 14 (107) | 31 (203) | 20 (158) |
| 3. Arranging for finances | 55 (436) | 32 (216) | 9 (64) | 5 (28) | 3 (12) | 32 (197) | 22 (173) |
| 4. Time required for contract issuance | 42 (319) | 30 (189) | 24 (182) | 6 (38) | 3 (13) | 32 (215) | 21 (168) |
| 5. Timeliness of vendor research and development efforts | 27 (182) | 24 (187) | 36 (278) | 16 (112) | 7 (40) | 26 (146) | 22 (177) |
| 6. Timeliness of equipment delivery | 27 (221) | 12 (85) | 28 (184) | 16 (83) | 13 (77) | 41 (306) | 21 (168) |
| 7. Adequacy of vendor support for equipment, systems, etc. | 34 (248) | 25 (186) | 26 (156) | 7 (39) | 8 (44) | 36 (280) | 22 (173) |
| 8. Time required for non-NRC regulatory or rate-making approval | 60 (457) | 8 (41) | 3 (13) | 0 | 2 (7) | 64 (438) | 21 (168) |
| 9. Other (SPECIFY) | 0 | 0 | 2 (14) | 3 (30) | 2 (14) | 2 (19) | 149 (1047) |

Question 8A to Question 11 address the costs incurred or to be incurred at your powerplant in connection with this item. REMEMBER, in some instances items have several parts. For example, in NUREG 0737, item II.B.2, Plant Shielding is shown as having three parts:

- II.B.2.1-Plant Shielding-Review Designs
- II.B.2.2-Plant Shielding-Plant Modification
- II.B.2.3-Plant Shielding-Equipment Qualification

For purposes of completing this questionnaire, each of these parts should be considered an item. While you may not have cost information by item, please provide YOUR BEST ESTIMATE for the specific item shown on the item identification label.

8A. What is the total cost to date of this item at your powerplant?

\$ 300,475,225 TOTAL COST TO DATE
 (1,521,200,544)

8B. Is the cost in Question 8A an estimated or actual cost? (CHECK ONE.)

- 1. Estimated Cost
423-(2910)
- 2. Actual Cost
86-(637) No Response 139-(1032)

8C. What percentage of the total cost specified in 8A was due to the following: (PERCENTAGES SHOULD TOTAL TO 100%.)

| | <u>PERCENTAGES</u> | |
|--|--------------------|-----------|
| Utility Staff (i.e., engineering, craft (field labor), administration, training, etc.) | 48.17 | % (47.26) |
| Material and Equipment | 15.35 | % (13.37) |
| Consultant Services | 18.66 | % (19.41) |
| Contracted Services | 14.91 | % (16.45) |
| Other (SPECIFY) _____ | 2.85 | % (3.48) |
| _____ | | |
| Other (SPECIFY) _____ | .06 | % (0.04) |
| _____ | | |
| | 100% | 100% |

9. Will there be additional costs associated with meeting the NUREG 0737 requirement for this item at your powerplant?
(CHECK ONE.)

- 126-(940)
1. Yes...CONTINUE TO QUESTION 10A
402-(2689)
2. No....SKIP TO QUESTION 11
No Response 120-(950)

10A. What is the estimated (future) additional cost to your powerplant to meet the NUREG 0737 requirement for this item?

\$ 28,407,134 ESTIMATED ADDITIONAL COST
(151,319,848)

10B. What percentage of the estimated (future) additional cost specified in 10A was due to the following: (PERCENTAGES SHOULD TOTAL TO 100%.)

| | PERCENTAGES | |
|--|-------------|-----------|
| Utility Staff (i.e., engineering, craft (field labor), administration, training, etc.) | 44.62 | % (44.99) |
| Material and Equipment | 17.30 | % (15.00) |
| Consultant Services | 18.16 | % (18.78) |
| Contracted Services | 16.38 | % (17.30) |
| Other (SPECIFY) _____ | 3.54 | % (3.93) |
| Other (SPECIFY) _____ | 0 | % 0 |
| | 100% | 100% |

11. Did work on this item require an unscheduled powerplant outage or a time extension to a scheduled outage? (CHECK ONE.)

- 12-(91)
1. Yes...CONTINUE TO QUESTION 12
512-(3504)
2. No....SKIP TO QUESTION 13
No Response 124-(983)

12. Please estimate the replacement power cost to date associated with either the unscheduled powerplant outage or a time extension due to work on this item.

\$ 38,061,110 COST TO DATE
(374,349,657)

13. What will be the average annual recurring cost associated with this item? PLEASE INCLUDE COSTS SUCH AS MAINTENANCE, TESTING, SURVEILLANCE, STAFFING AND TRAINING.

\$ 12,998,430 AVERAGE ANNUAL RECURRING COST
(61,013,297)

14A. In addition to those changes necessary to meet the NUREG 0737 requirement, has or will your utility make changes to improve the performance of this item at your powerplant? (CHECK ONE.)

47-(282)

1. Yes, utility has made additional changes...CONTINUE TO QUESTION 14B
59-(395)

2. Yes, utility will make additional changes...CONTINUE TO QUESTION 14B
421-(2938)

3. No.....SKIP TO QUESTION 15
No Response 121-(964)

14B. How much has your utility spent to date in making these additional changes?

\$ 62,028,112
(228,498,154)

14C. How much will your utility spend in the future in making these additional changes?

\$ 46,087,000
(206,152,596)

15. Overall, how favorable or unfavorable an impact has this item had, or will it have, in each of the following areas at your powerplant? (FOR EACH AREA CHECK ONE COLUMN.) REMEMBER, IN SOME INSTANCES ITEMS HAVE SEVERAL PARTS. SEE INTRODUCTION FOR AN EXAMPLE.

| AREAS | WHAT TYPE OF IMPACT? | | | | | | No Response |
|---------------------------------------|----------------------|----------------|----------------------------|-----------------------|----------------------------|--------------------|---------------|
| | Very Favorable 1 | Favorable 2 | Neutral/ No Impact 3 | Un- favorable 4 | Very Un- favorable 5 | No Opinion 6 | |
| 1. Cost effectiveness | 4 (32) | 56 (422) | 206 (1441) | 173 (1213) | 69 (378) | 35 (261) | 105 (832) |
| 2. Knowledge of powerplant operations | 14 (96) | 142 (1033) | 361 (2445) | 6 (36) | 0 | 18 (129) | 107 (840) |
| 3. Powerplant reliability | 4 (29) | 92 (721) | 400 (2667) | 31 (201) | 4 (39) | 13 (98) | 104 (823) |
| 4. Powerplant safety | 23 (177) | 198 (1424) | 298 (1992) | 8 (45) | 2 (15) | 17 (121) | 102 (804) |
| 5. Powerplant life expectancy | 1 (4) | 37 (275) | 487 (3330) | 5 (37) | 1 (10) | 12 (94) | 105 (828) |
| 6. Public health protection | 14 (57) | 181 (1180) | 330 (2378) | 6 (42) | 0 | 13 (104) | 104 (817) |
| 7. Powerplant staff health protection | 7 (35) | 133 (789) | 368 (2679) | 20 (125) | 3 (23) | 13 (104) | 104 (823) |
| 8. Staff capability | 7 (37) | 167 (1051) | 314 (2252) | 14 (93) | 0 | 41 (312) | 105 (833) |
| 9. Community relations | 4 (17) | 59 (244) | 411 (3007) | 8 (29) | 3 (16) | 59 (443) | 104 (823) |
| 10. Environmental protection | 5 (26) | 79 (499) | 419 (2923) | 1 (4) | 0 | 40 (303) | 104 (823) |
| 11. Daily powerplant operations | 5 (21) | 88 (678) | 391 (2687) | 47 (272) | 1 (4) | 11 (84) | 105 (833) |
| 12. Powerplant maintenance | 4 (16) | 26 (176) | 394 (2718) | 95 (655) | 14 (100) | 11 (90) | 104 (823) |
| 13. Emergency responsiveness | 32 (160) | 217 (1387) | 282 (2111) | 3 (17) | 0 | 10 (80) | 104 (823) |
| 14. Other (SPECIFY) | 1 (3) | 0 | 4 (36) | 2 (13) | 0 | 4 (26) | 637 (4500) |

LISTING OF UTILITIES THAT RECEIVED AND COMPLETED GAO QUESTIONNAIRES

| <u>Utility name</u> | <u>Power plant name</u> | <u>Number of questionnaires sent</u> | <u>Number of questionnaires returned</u> |
|--|-------------------------|--------------------------------------|--|
| Alabama Power Company ^a | Farley 1 | 13 | 0 |
| Arkansas Power and Light Company | Arkansas 1 | 12 | 12 |
| | Arkansas 2 | 14 | 14 |
| Baltimore Gas and Electric Company | Calvert Cliffs 1 | 15 | 15 |
| | Calvert Cliffs 2 | 12 | 12 |
| Boston Edison Company | Pilgrim 1 | 13 | 13 |
| Carolina Power and Light Company | Brunswick 1 | 14 | 14 |
| | Brunswick 2 | 12 | 12 |
| | Robinson 2 | 13 | 13 |
| Commonwealth Edison Company ^a | Dresden 2 | 12 | 0 |
| | Dresden 3 | 13 | 0 |
| | Quad Cities 1 | 13 | 0 |
| | Quad Cities 2 | 14 | 0 |
| | Zion 1 | 12 | 0 |
| | Zion 2 | 13 | 0 |
| Consolidated Edison Company of New York | Indian Point 2 | 13 | 13 |
| Consumers Power Company | Big Rock Point 1 | 12 | 12 |
| | Palisades | 12 | 12 |
| Dairyland Power Cooperative | La Crosse | 12 | 12 |
| Duke Power Company ^b | Oconee 1 | 12 | 12 |
| | Oconee 2 | 12 | 12 |
| | Oconee 3 | 13 | 13 |
| Duquesne Light Company | Beaver Valley 1 | 13 | 13 |
| Florida Power Company | Crystal River 3 | 13 | 13 |
| Florida Power and Light Company ^a | St. Lucie | 12 | 0 |
| | Turkey Point 3 | 12 | 0 |
| | Turkey Point 4 | 12 | 0 |
| Georgia Power Company | Hatch 1 | 13 | 13 |
| | Hatch 2 | 13 | 13 |

^aUtility did not respond to GAO's questionnaires.

^bUtility provided information on the specific items required at its plant(s) but did not respond to GAO's four general questions regarding the impact of the Action Plan.

| <u>Utility name</u> | <u>Power plant name</u> | <u>Number of questionnaires sent</u> | <u>Number of questionnaires returned</u> |
|--|-------------------------|--------------------------------------|--|
| GPU Nuclear Corporation | Oyster Creek 1 | 13 | 9 |
| Indiana and Michigan Electric Company | Cook 1 | 13 | 13 |
| | Cook 2 | 15 | 15 |
| Iowa Electric Power and Light Company | Duane Arnold | 13 | 13 |
| Maine Yankee Atomic Power Corporation ^a | Maine Yankee | 13 | 0 |
| Nebraska Public Power District | Cooper Station | 14 | 14 |
| Niagra Mohawk Power Corporation | Nine Mile Point 1 | 12 | 12 |
| Northeast Utilities | Haddam Neck | 12 | 12 |
| | Millstone 1 | 13 | 13 |
| | Millstone 2 | 12 | 12 |
| Northern States Power Company ^b | Monticello | 13 | 13 |
| | Prairie Island 1 | 12 | 12 |
| | Prairie Island 2 | 12 | 12 |
| Omaha Public Power District | Fort Calhoun 1 | 14 | 14 |
| Philadelphia Electric Power Company | Peach Bottom 2 | 13 | 13 |
| | Peach Bottom 3 | 13 | 13 |
| Portland General Electric Company | Trojan | 12 | 12 |
| Power Authority, State of New York | Fitzpatrick | 13 | 13 |
| | Indian Point 3 | 12 | 12 |
| Public Service Electric and Gas | Salem 1 | 12 | 12 |
| Rochester Gas and Electric Corporation | Ginna | 13 | 13 |
| Sacramento Municipal Utility District ^a | Rancho Seco 1 | 13 | 0 |
| Public Service Company of Colorado | Fort St. Vrain | 12 | 12 |
| Southern California Edison Company | San Onofre 1 | 13 | 13 |
| Tennessee Valley Authority | Browns Ferry 1 | 12 | 12 |
| | Browns Ferry 2 | 12 | 12 |
| | Browns Ferry 3 | 13 | 13 |

| <u>Utility name</u> | <u>Power plant name</u> | <u>Number of questionnaires sent</u> | <u>Number of questionnaires returned</u> |
|---|-------------------------|--|--|
| Toledo Edison Company ^a | Davis-Besse 1 | 12 | 0 |
| Vermont Yankee Nuclear Power Corporation | Vermont Yankee 1 | 13 | 13 |
| Virginia Electric and Power Company | North Anna 1 | 13 | 13 |
| | Surry 1 | 14 | 14 |
| | Surry 2 | 15 | 15 |
| Wisconsin Electric Power Company | Point Beach 1 | 12 | 12 |
| | Point Beach 2 | 12 | 12 |
| Wisconsin Public Service | Kewaunee | 12 | 12 |
| Yankee Atomic Electric Company ^a | Yankee Rowe 1 | <u>12</u> | <u>0</u> |
| Total | | <u>828</u> | <u>648</u> |

SUMMARY OF UTILITY RESPONSES TO FOUR QUESTIONS



The purpose of this enclosure is to obtain information concerning the overall impact on your utility due to meeting the NUREG 0737 requirements. If your utility operates more than one nuclear powerplant, please summarize the impacts of meeting the NUREG 0737 item requirements at all powerplants.

1. What percentage of NUREG 0737 item requirements applicable to your powerplant(s) have been met to date by your utility?

81.9 % OF NUREG 0737 ITEMS MET (31 utilities representing 54 plants)

2. What is the cost to date and estimated additional cost for meeting the NUREG 0737 requirements at your utility?

\$ 1,227,903,770 COST TO DATE (31 utilities representing 54 plants)

\$ 510,118,500 ESTIMATED ADDITIONAL COSTS (31 utilities representing 54 plants)¹

3. How many additional permanent staff members were hired as a result of meeting the NUREG 0737 requirements at your utility?

1,952 ADDITIONAL PERMANENT STAFF MEMBERS (31 utilities representing 54 plants)²

4. Briefly, what is your opinion of NRC's method of implementing NUREG 0737 and the effect on your utility? (You may write your comments on additional pages if necessary.)

¹One utility did not provide any estimate of additional costs.

²Six utilities did not provide any estimate of additional permanent staff members.

Please provide the names, titles and phone numbers of officials completing this enclosure so that we can contact them if we need to clarify any answers.

Name _____ Name _____

Title _____ Title _____

Telephone () _____ Telephone () _____

Number Area Code Number Area Code

NRC QUESTIONNAIRE
WITH SUMMARY OF RESPONSES



IMPORTANT!
Official Government
Business

U.S. GENERAL ACCOUNTING OFFICEREVIEW OF NRC'S IMPLEMENTATION OF THE TMI ACTION PLANINTRODUCTION

The purpose of this questionnaire is to obtain information from officials of the Nuclear Regulatory Commission (NRC) concerning the extent of changes being made in improving the operation and regulation of nuclear powerplants following the March 1979 accident at Three Mile Island (TMI). The results will be used by the U.S. General Accounting Office, an agency of the Congress, in reporting on NRC's efforts to implement its 1980 plan to improve the regulation and operation of nuclear powerplants. This plan is frequently called the TMI Action Plan (NUREG 0660).

Your answers will be held strictly confidential and will be used only for purposes of this study. Although this questionnaire may take some time to complete, we hope that you will understand that your answers are extremely important. We will use the results of these questionnaires in a report to the Congress discussing the progress made by NRC and the Nation's nuclear utilities in implementing the TMI Action Plan.

The information you are being requested to provide is for items we have selected from the 220 items in the Action Plan Tracking System (APTS) which were part of the Action Plan, but were not included in NUREG 0737-"Clarification of TMI Action Plan Requirements." Information on the status of the 131 items in NUREG 0737 is being obtained from the Nation's nuclear utilities.

Each questionnaire concerns one specific item. A review of NUREG 0660 and NUREG 0933 (A Prioritization of Generic Safety Issues) may assist you in completing the questionnaire on the specific item shown on the Item Identification Label (See Page 2). Most of the questions can be completed by filling in blanks or checking boxes. There is space available for any comments you may wish to add. Also, representatives of the General Accounting Office will examine a number of Action Plan items to obtain more detailed information on the progress being made.

Please return the completed questionnaire in the self-addressed envelope within 10 days after receipt. The questionnaire is numbered so that we can delete your name from our list when we receive your completed questionnaire(s) and, thus, avoid sending you an unnecessary follow-up request.

If you have any questions, please call either Darryl L. Wittenburg or Michael R. Keppel in our Pittsburgh Office at FTS 722-5903. Thank you for your cooperation.

If the self-addressed envelope is misplaced, please mail the completed questionnaire(s) to:

Mr. Michael R. Keppel
U.S. General Accounting Office
445 Fort Pitt Boulevard-Suite 310
Pittsburgh, PA 15219

*****ITEM IDENTIFICATION LABEL*****

PLEASE COMPLETE THIS QUESTIONNAIRE ON THE FOLLOWING ACTION PLAN ITEM

ACTION PLAN ITEM NUMBER

ACTION PLAN ITEM TITLE

In some instances, Action Plan Items have several parts. For example, in APTS (Action Plan Tracking System), Item II.J.2 (Construction Inspection Program) is shown as having three parts:

- II.J.2.1- Construction Inspection Program-Reorient Construction Inspection Program
- II.J.2.2- Construction Inspection Program-Increase Emphasis on Independent Measurement in the Construction Inspection Program
- II.J.2.3- Construction Inspection Program- Assign Resident Inspectors To All Construction Sites

For purposes of completing this questionnaire, each of these parts should be considered an item. Complete the questionnaire only for the item shown on the ITEM IDENTIFICATION LABEL (See Above).

- 1. Below is the initial NUREG 0660 estimated completion deadline date for the item shown on the Item Identification Label. (See Page 2.)

| |
|--|
| <p>108 Had a deadline date. 114 Did not have a deadline date. <u>222</u></p> |
|--|

- 2. Has a deadline date for completing this item been established within NRC? (CHECK ONE.)

1. [42] Yes...SKIP TO QUESTION 4

2. [55] No....CONTINUE TO QUESTION 3

- 3. Please explain why a deadline date has not been established for completing this item. (AFTER COMPLETING QUESTION 3 SKIP TO QUESTION 5.)

54 Comments received

1 Did not comment

- 4. What was the initial NRC deadline date for completing this item?

 /
MONTH/YEAR

5. Question 5 addresses the status of this item. FOR THE PURPOSE OF THIS QUESTIONNAIRE, COMPLETE MEANS THAT THE NUREG 0660 REQUIREMENT FOR THIS ITEM HAS BEEN FULFILLED. NO ADDITIONAL NRC WORK OTHER THAN FOR AUDITS AND/OR INSPECTIONS ON THIS SPECIFIC ITEM IS NEEDED.

Which of the following statements is true for this item?

INSTRUCTIONS FOR QUESTION 5

IN COLUMN A: CHECK ONE

IN COLUMN B: FOR STATEMENTS 1 OR 2 PROVIDE THE ACTUAL COMPLETION DATE
FOR STATEMENTS 3, 4, OR 5 PROVIDE THE ESTIMATED COMPLETION DATE

IN COLUMN C: FOLLOW INSTRUCTIONS

| <u>COLUMN A</u> | <u>COLUMN B</u> | <u>COLUMN C</u> |
|--|---|------------------------|
| STATEMENTS (CHECK ONE) | ACTUAL/ESTIMATED COMPLETION DATE MONTH/YEAR | INSTRUCTIONS |
| 1. [63] Item was completed on or before the deadline date shown in either QUESTION 1 or Question 4 | / | SKIP TO QUESTION 9 |
| 2. [37] Item was completed after the deadline date shown in either Question 1 or Question 4 | / | CONTINUE TO QUESTION 6 |
| 3. [39] Item is active and ongoing | / | CONTINUE TO QUESTION 6 |
| | NO DATE [] ESTABLISHED | |
| 4. [29] Item is currently inactive | / | SKIP TO QUESTION 7A |
| | NO DATE [] ESTABLISHED | |
| 5. [54] Item was subsumed by other Action Plan item(s) | / | SKIP TO QUESTION 8A |
| | NO DATE [] ESTABLISHED | |

Total 222 items

6. IF A DEADLINE DATE HAS NOT BEEN ESTABLISHED FOR COMPLETING THIS ITEM SKIP TO QUESTION 9.

Whether or not this item is complete, how much impact (if any) did each of the following reasons have in delaying the item from being completed by the initial deadline date shown in either Question 1 or Question 4? (FOR EACH REASON CHECK ONE COLUMN.)

| REASONS FOR DELAY | HOW MUCH OF AN IMPACT? | | | | | | No Response |
|---|------------------------|---------------------|----------------------|-------------------|------------------------|---------------------|-------------|
| | No Impact 1 | Mininal Impact 2 | Moderate Impact 3 | Great Impact 4 | Very Great Impact 5 | NOT APPLICABLE 6 | |
| 1. Feasibility of the initial deadline date | 7 | 3 | 14 | 18 | 10 | 6 | 2 |
| 2. Timeliness of contractor performance | 17 | 9 | 8 | 3 | 2 | 18 | 3 |
| 3. Funding availability | 21 | 8 | 8 | 2 | 4 | 14 | 3 |
| 4. Time required for unanticipated technical problems | 21 | 8 | 11 | 7 | 5 | 5 | 3 |
| 5. Availability of NRC staff to work on this item | 19 | 11 | 14 | 6 | 5 | 3 | 3 |
| 6. Clarity of responsibilities within NRC | 34 | 7 | 7 | 3 | 0 | 6 | 3 |
| 7. Clarity of responsibilities between NRC and other Federal agencies | 31 | 4 | 1 | 1 | 2 | 18 | 3 |
| 8. Item was dependent on work on other Action Plan item activities | 24 | 10 | 2 | 3 | 0 | 18 | 3 |

QUESTION 6 CONTINUES ON THE NEXT PAGE

CONTINUATION OF QUESTION 6

| REASONS FOR DELAY | HOW MUCH OF AN IMPACT? | | | | | | No Response |
|---|------------------------|---------------------|----------------------|-------------------|------------------------|---------------------|-------------|
| | No Impact 1 | Mininal Impact 2 | Moderate Impact 3 | Great Impact 4 | Very Great Impact 5 | NOT APPLICABLE 6 | |
| 9. Congress requested emphasis on other areas | 27 | 1 | 3 | 3 | 3 | 20 | 3 |
| 10. NRC placed priority on other areas | 21 | 12 | 9 | 5 | 1 | 9 | 3 |
| 11. Time required for item analysis and/or testing | 12 | 11 | 7 | 10 | 7 | 11 | 2 |
| 12. Nuclear industry comments/views on the item | 26 | 9 | 8 | 5 | 1 | 9 | 2 |
| 13. Public comments/views on the item | 29 | 9 | 6 | 0 | 1 | 12 | 3 |
| 14. Obtaining NRC Commissioners' approval | 29 | 8 | 2 | 3 | 0 | 15 | 3 |
| 15. Availability of a national standard for the item | 24 | 4 | 7 | 0 | 0 | 22 | 3 |
| 16. NRC supervisory/management responsiveness on the item | 30 | 11 | 9 | 1 | 1 | 5 | 3 |
| 17. Other (SPECIFY) | 0 | 0 | 2 | 6 | 9 | 1 | 42 |

SKIP TO QUESTION 9

7A. On what date was this item established as inactive within NRC?

 /
MONTH/YEAR

7B. Is the date provided in Question 7A (above) an actual or estimated date? (CHECK ONE.)

- 1. [16] Actual Date
- 2. [13] Estimated Date

7C. How much impact (if any) did each of the following reasons have on why this item was established as inactive? (FOR EACH REASON CHECK ONE COLUMN.)

| REASONS WHY THE ITEM IS INACTIVE | HOW MUCH OF AN IMPACT? | | | | | | No Response |
|---|------------------------|----------------|-----------------|--------------|-------------------|----------------|-------------|
| | No Impact | Mininal Impact | Moderate Impact | Great Impact | Very Great Impact | NOT APPLICABLE | |
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| 1. Funding availability | 12 | 6 | 2 | 0 | 0 | 7 | 2 |
| 2. Availability of NRC staff to work on the item | 10 | 6 | 6 | 1 | 2 | 3 | 1 |
| 3. Congress requested emphasis on other areas | 13 | 5 | 2 | 1 | 0 | 7 | 1 |
| 4. NUREG 0933 recommends that this item be given a low priority or be dropped | 6 | 2 | 1 | 0 | 9 | 10 | 1 |
| 5. Item is dependent on work in other Action Plan item activities | 7 | 3 | 1 | 1 | 3 | 13 | 1 |
| 6. NRC placed priority on other areas | 7 | 6 | 4 | 4 | 2 | 5 | 1 |

QUESTION 7C CONTINUES ON THE NEXT PAGE

CONTINUATION OF QUESTION 7C

HOW MUCH OF AN IMPACT?

| REASONS WHY THE ITEM IS INACTIVE | No Impact | Minimal Impact | Moderate Impact | Great Impact | Very Great Impact | NOT APPLICABLE | No Response |
|--|-----------|----------------|-----------------|--------------|-------------------|----------------|-------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| 7. Waiting for contract to be awarded | 11 | 0 | 0 | 0 | 0 | 17 | 1 |
| 8. Awaiting contractor results | 12 | 1 | 0 | 0 | 0 | 15 | 1 |
| 9. Awaiting approval to make item active | 5 | 1 | 0 | 2 | 2 | 18 | 1 |
| 10. Awaiting issuance of revised or approved guidelines or regulations | 8 | 0 | 1 | 0 | 2 | 17 | 1 |
| 11. Awaiting comments | 9 | 0 | 0 | 0 | 1 | 18 | 1 |
| 12. Item is being adequately covered by other ongoing programs or activities | 2 | 1 | 1 | 5 | 7 | 11 | 2 |
| 13. Availability of a national standard for the item | 10 | 0 | 1 | 1 | 1 | 16 | 0 |
| 14. NRC supervisory/management responsiveness on the item | 7 | 3 | 3 | 3 | 2 | 10 | 1 |
| 15. Other (SPECIFY) | 0 | 0 | 0 | 2 | 5 | 0 | 22 |
| 7 responses received | | | | | | | |

SKIP TO QUESTION 9

8A. On what date was this item subsumed by other Action Plan item(s)?

MONTH/YEAR

8B. Is the date provided in Question 8A (above) an actual or estimated date? (CHECK ONE.)

1. [28] Actual Date

2. [6] Estimated Date

20 Did not provide any response.

8C. By what item(s) was this item subsumed? (WRITE IN ITEM NUMBER.)

ITEM NUMBER _____

8D. Please explain why this item was subsumed.

33 Comments Received

21 Did not Comment

9. How favorable or unfavorable an impact has this item had, or will it have, in each of the following areas on nuclear powerplants? (FOR EACH AREA CHECK ONE COLUMN.)

| AREAS | WHAT TYPE OF IMPACT? | | | | | | No Response |
|--|----------------------|----------------|----------------------------|-----------------------|----------------------------|--|-------------|
| | Very Favorable 1 | Favorable 2 | Neutral/ No Impact 3 | Un- favorable 4 | Very Un- favorable 5 | Not Appli- cable/No Opinion 6 | |
| 1. Powerplant operations | 19 | 47 | 43 | 7 | 0 | 51 | 1 |
| 2. Powerplant reliability | 10 | 43 | 55 | 1 | 0 | 58 | 1 |
| 3. Powerplant safety | 20 | 80 | 26 | 1 | 0 | 39 | 2 |
| 4. Powerplant life expectancy | 2 | 16 | 80 | 0 | 0 | 69 | 1 |
| 5. Powerplant maintenance | 11 | 31 | 58 | 5 | 0 | 62 | 1 |
| 6. Powerplant staff health protection | 13 | 38 | 56 | 1 | 0 | 59 | 1 |
| 7. Public health and safety protection | 26 | 88 | 24 | 0 | 0 | 29 | 1 |
| 8. Emergency responsiveness | 19 | 55 | 42 | 0 | 2 | 49 | 1 |
| 9. Environmental protection | 16 | 43 | 53 | 0 | 0 | 55 | 1 |
| 10. Staff capability | 27 | 57 | 38 | 3 | 0 | 40 | 3 |
| 11. Cost effectiveness | 18 | 46 | 42 | 9 | 2 | 50 | 1 |
| 12. Community relations | 21 | 36 | 48 | 3 | 0 | 53 | 2 |
| 13. Other (SPECIFY) | 4 | 5 | 1 | 0 | 0 | 2 | 156 |
| 12 responses | | | | | | | |
| received | | | | | | | |

10. How favorable or unfavorable an impact has this item had, or will it have, on NRC'S ABILITY TO REGULATE nuclear powerplants in each of the following areas? (FOR EACH AREA CHECK ONE COLUMN.) NOTE: the 54 questionnaires indicating the item as subsumed were not included in this analysis.

WHAT TYPE OF IMPACT?

| AREAS | Very Favorable | Favorable | Neutral/ No Impact | Un- favorable | Very Un- favorable | Not Appli- cable/No Opinion | No Response |
|--|----------------|-----------|-----------------------|------------------|-----------------------|-----------------------------------|----------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| 1. Powerplant operations | 17 | 49 | 49 | 2 | 0 | 46 | 5 |
| 2. Powerplant reliability | 9 | 27 | 70 | 1 | 0 | 58 | 3 |
| 3. Powerplant component safety | 10 | 52 | 54 | 0 | 0 | 49 | 3 |
| 4. Powerplant life expectancy | 1 | 10 | 83 | 0 | 0 | 71 | 3 |
| 5. Powerplant maintenance | 7 | 42 | 63 | 1 | 0 | 52 | 3 |
| 6. Powerplant staff health protection | 12 | 31 | 69 | 1 | 0 | 52 | 3 |
| 7. Public health and safety protection | 21 | 77 | 38 | 1 | 0 | 28 | 3 |
| 8. Emergency responsiveness | 16 | 57 | 46 | 2 | 0 | 44 | 3 |
| 9. Environmental protection | 11 | 33 | 67 | 1 | 0 | 53 | 3 |
| 10. Overall NRC staff capability | 19 | 64 | 45 | 2 | 0 | 34 | 4 |
| 11. Cost effectiveness of NRC staff activities | 22 | 45 | 51 | 6 | 0 | 40 | 4 |
| 12. Other (SPECIFY) | 4 | 5 | 1 | 0 | 0 | 2 | 156 |
| <u>12 responses</u> <u>received</u> | | | | | | | |

11A. In your opinion, is/was there a need to complete this item? (CHECK ONE.)

(NOTE: The 54 questionnaires indicating the item as subsumed were not included in this analysis.)

- 1. Yes.....CONTINUE TO QUESTION 11B
- 2. No.....CONTINUE TO QUESTION 11B
- 3. No Opinion...SKIP TO QUESTION 12
- No Response

11B. Please explain your response to Question 11A.

154 Comments Received

(3 indicating a need to complete did not provide comments while the non-respondent above provided a comment)

STATUS AND PRIORITY OF THE 39 ACTION PLAN ITEMS
APPROVED FOR IMPLEMENTATION BY UTILITIES

COMPLETE ITEMS

Priority 1

Provide a technical advisor to the control room supervisor on each shift at the operating facility.¹

Relieve shift supervisor of nonsafety administrative duties.¹

Recruit and train personnel for shift operations and develop over-time procedures to ensure that qualified individuals are readily available in the event of an abnormal or emergency situation.¹

Recruit and train personnel to meet specific criteria in training and qualifications of senior reactor operators and control room operators.

Review and revise as necessary plant procedures for shift and relief changes to ensure that each oncoming shift is aware of critical plant status information.

Revise plant procedures to properly define duties, responsibilities, and authority of the shift supervisor and control room operators.

Revise procedures covering the lines of authority and responsibility in the control room in the event of an emergency.¹

Review procedures for providing operators and other operations personnel operating experience from within and outside their organizations.

Develop training program to teach the use of installed equipment and systems to control or mitigate accidents in which the core is severely damaged.¹

Upgrade pressurizer heater power supply and associated motive and control power interfaces and establish procedures and training for the revised system.¹

Review and revise, as necessary, procedures for use of combustible gas control systems and modify plants with external hydrogen recombiners.¹

¹Specific power plant actions included in this Action Plan item were not included in the GAO sample. Their status was obtained from NRC's Three Mile Island Action Plan requirements schedule (Operating Reactors Licensing Action Summary).

Develop procedures and implement modifications to upgrade motive and control components to safety-grade criteria and electric power from emergency power sources for the power suppliers for pressurizer relief valves, block valves, and level indicators.

Describe implementation plans for the nine NRC Office of Inspection and Enforcement Bulletins.

Upgrade emergency preparedness in accordance with the requirements in the Action Plan for "Promptly Improving Emergency Preparedness" and "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants."

Priority 2

Ensure that facility instructors demonstrate senior reactor operator qualifications.

Prepare reactor operator applicants for revised reactor operator licensing examination and develop and implement new examination criteria for operator requalification program.

Submit report on outages of emergency core-cooling systems and propose changes to improve availability of the system.

Implement a leak-reduction program on primary coolant sources outside containment structure.¹

Priority 3

Evaluate locations and ranges of radio-iodine monitors, provide results to NRC, and install new monitors as required.

INCOMPLETE ITEMS

Priority 1

Perform analysis of small-break loss-of-coolant accidents and inadequate core-cooling accidents, prepare and implement procedures on each type of accident, and retrain operators.

Review control room, using NRC human factors design guidelines, and modify to correct deficiencies.

Design and install a safety parameter display console.¹

Test that relief and safety valves, block valves, and associated piping in reactor coolant systems are qualified for the full range of operating and accident conditions.

Install devices for determining relief and safety valve position indication.

Provide responses on auxiliary feedwater system evaluation.

Submit design proposal and accident analysis on auxiliary feedwater system automatic initiation and flow indication.

Evaluate installations for isolation dependability and for purge valve closure.¹

Replace or procure instrumentation to measure containment pressure, containment water level, containment hydrogen concentration, and containment radiation intensity and to monitor high-range effluents.

Install a subcooling meter--an instrument to detect conditions that may lead to inadequate core cooling--and develop and implement procedures to detect and recover from conditions leading to inadequate core cooling.¹

Complete remaining actions from the generic assessment of feedwater transients.

Complete remaining actions from generic review of small-break loss-of-coolant accident and loss of feedwater.

Establish a technical support center, operational support center, and emergency operations facility.

Priority 2

Review and revise, as necessary, procedures for verification of correct performance of operating activities.

Install a high-point reactor coolant system and reactor vessel head vents.

Review spaces around systems that may contain highly radioactive fluid and implement modifications to permit adequate access to vital areas and protect safety equipment.

Review plant post-accident sampling system.

Review control room habitability to make necessary modifications.¹

Priority 3

Revise emergency plans to comply with the amended 10 CFR 50 and Appendix E to 10 CFR 50.

Develop guidance and criteria for preparation and evaluation of radiological emergency response plans and preparedness in support of nuclear power plants.

LIST OF INCOMPLETE HIGH PRIORITY
DEVELOPMENTAL ITEMS

NRC will upgrade reactor operator training by requiring operating personnel to conduct plant drills simulating normal and abnormal operating maneuvers during work shifts.

NRC will develop new regulations and regulatory guides for the training and qualifications of reactor operators, senior operators, shift supervisors, auxiliary operators, technicians, and possibly other operating personnel.

NRC will require that weaknesses in simulators used to train licensed operators be corrected to establish a high level of realism in training and retraining operators--including dealing with the complex problems resulting from various combinations of plant system failures.

NRC will develop criteria for on-site and off-site management and technical organizations that will ensure the safe operation of the plant during normal and abnormal conditions and the capability to respond to accident situations.

NRC will evaluate the organization and management capabilities of near-term operating license applicants including on-site and off-site management and technical organizations.

NRC will issue a proposed regulatory guide concerning a Control Room Design Standard on the basis of an evaluation of specific industry standards.

NRC will conduct special operational safety data analyses to determine equipment failure rates and to develop error data analyses for nuclear plants' operations.¹

NRC will determine what additional measures and/or design changes should be made to further reduce the probability of a severe reactor accident and the consequences of such an accident in areas of high population density.

NRC and contractor analysts will perform system reliability evaluations for regulatory evaluation and possible requirement development.

NRC will coordinate and expand on work conducted in Unresolved Safety Issue A-17 concerning system interaction to incorporate these efforts into a broader effort addressing system reliability.

¹This item is active and ongoing. According to the NRC, this item will never be complete because the data collection is a continuous activity.

NRC will focus research efforts on small-break loss-of-coolant accidents and transients to improve operator performance during abnormal events.

NRC will conduct a study to assess the capability and reliability of shutdown heat removal systems under various plant conditions including complete loss of all feedwater.

NRC will monitor, review, and assess the safety and environmental impact of the post-accident operation, cleanup, and possible recovery operations at Three Mile Island.

NRC will improve, as necessary, the event-reporting requirements to ensure that all reportable items are reported promptly and that information submitted is complete.

EXCERPTS FROM THE APRIL 5, 1984,
NRC COMMISSIONER BRIEFING ON THE STATUS
OF UTILITY AND NRC COMPLIANCE WITH THE
TMI [THREE MILE ISLAND] ACTION PLAN¹

Chairman of the Commission:² . . . you plan to discontinue [the] Action Plan tracking system, and you're going to issue one last update. Could you explain what you have in mind there and why you're dropping the tracking system?

Chief, Safety Program Evaluation Branch: We think that the Action Plan tracking system is probably outdated, and we are trying to organize all of our generic issue management, both in resolution and implementation. And so the system that's just focusing on the Action Plan is no longer appropriate.

Plus, I think the way it was organized was not the most convenient way to do it, and we now have a system in which archival information is kept in a separate book and the active issues would then be kept in the tracking system, which is different than the Action Plan tracking system.

The suggestion has been made and we'll probably adopt it, that we will issue one last update of the Action Plan [tracking system] as best we can do it, and that will be its swan song, and all of the tracking then will go over to our tracking systems for all generic issues and not TMI [Three Mile Island] Action Plan issues.

Chairman: Does that mean that if at a later time we want to examine the status of [the] TMI Action Plan items, you couldn't pull it out as a subset of your generic tracking system?

Chief: No. I think--the answer to that question is yes and no. In 0933 where we're keeping track of things, I think in the generic issues management control system they are kept separate. But what is happening is that the Action Plan issues are slowly getting mixed together and combined with the other issues. As I noted, there were 14 items which we went through which disappeared into other items. The human factors program plan is going to absorb some more. The QA [Quality Assurance] is now developing a more integrated program and that's going to absorb a couple more. (Emphasis added.)

So I think the answer is really no, because the Action Plan, the TMI Action Plan items are going to disappear, and they're going to be incorporated into more general things. We're no longer focusing just on the Action Plan. (Emphasis added.)

¹Excerpted from transcript, pp. 53 - 56.

²We identify the speaker by his NRC title.

Chairman: Does the staff see any need to respond to inquiries about how we're doing on the Action Plan? For example, I could see some questions coming in a future hearing by a congressional committee that says well, how are you doing on the Action Plan. And then you, if I understand you correctly, will not be able to draw the data out.

Chief: Well, to a degree that's the case now, because as I say, things are starting to get mixed up. And yes, I can still give you a list of items and tell you this is that and that is the other thing. But--and I think the human factors program thing illustrates it. You may have an Action Plan item that's resolved and implemented, or mostly implemented, and yet there's a lot of ongoing work in that very same area. So it's misleading to tell somebody just that the Action Plan item is done. That doesn't tell the whole story. (Emphasis added.)

So from the congressional questions I have seen, I think they are getting more knowledgeable of our operations and instead of limiting their questions to [the] Action Plan, they're starting to ask us about generic issues and not just unresolved generic issues--not just safety issues, but all generic issues.

And I think we should encourage them in that, because I think that's where the focus ought to be. There are many what I think--there are many generic issues that I think are more important than a lot of the TMI Action Plan issues.

Chairman: Yes, I don't disagree with you there. But this was a rather unique circumstance, at least I hope it was a unique circumstance that led to quite an ambitious program and it's going to take some time before people are used to not asking about it.

Chief: Well, there's a good deal of appearance of a shell game, and I guess we get criticized about that quite often. Unfortunately, that has to be so because unless you want to stand in the same place and never change your mind, you're going to have to revise these things and make new ones and combine things together.

We're trying to keep a paper trail so that we can follow where TMI Action Plan item such-and-such went. It might be hard to summarize in any kind of a table, but I think--I hope anyway that we'll be able to maintain a tracking system such that when somebody asks about that issue we can say well, that's where it was back in 1983, but now it's part of item such-and-such. (Emphasis added.)

(301625)



3 1103

AN EQUAL OPPORTUNITY EMPLOYER

UNITED STATES
GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300

**BULK RATE
POSTAGE & FEES PAID
GAO
PERMIT No. G100**