

APR - 8 1991

MEMORANDUM FOR: Raymond F. Fraley, Executive Director
Advisory Committee on Reactor Safeguards

FROM: Eric S. Beckjord, Director
Office of Nuclear Regulatory Research

SUBJECT: PROPOSED AMENDMENTS TO 10 CFR PART 50 TO
UPDATE AND CLARIFY EMERGENCY PREPAREDNESS
REGULATIONS FOR NUCLEAR POWER PLANTS

Enclosed for review by the ACRS is the subject document which the NRC staff is recommending that the Commission issue in the Federal Register for public comment.

The paper contains recommendations to the Commission for revising its regulations in 10 CFR Part 50, to update the regulations, as well as clarify ambiguities that have surfaced during the past 10 years while implementing its emergency planning regulations. In addition, changes are being proposed to the emergency planning regulations which reflect insights gained from the new source term research.

The enclosed Federal Register Notice describes each of the proposed changes which are intended to accomplish the following:

1. Revise 50.47(b) to clarify that the reasonable assurance finding is directly linked to meeting the 16 planning standards.
2. Revise 50.47, 50.54 and Appendix E to incorporate the definition and use of fundamental flaws.
3. Revise 50.47(b)(10) in order to clarify that different protective action plans and responses are appropriate for different segments of the EPZ population under different conditions.
4. Add Footnote 1 to 50.47 in order to assure that NUREG-0654 is used as a tool for evaluating emergency plans and not as a regulation.
5. Revise Appendix E to reflect that a capability to monitor 20% of the population of the EPZ in 12 hours is acceptable.
6. Revise 50.47(b)(13) and Appendix E to require only that "criteria are provided to determine under what conditions following an accident, reentry of the facility and offsite area would be appropriate; rather than "general plans".

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7. Revise 50.47, 50.54 and Appendix E to reflect when the size of the EPZ can be modified as discussed in CLI-89-12.
8. Delete references to Part 70 licensees in Part 50.
9. Revise 10 CFR Part 50, Appendix E to clarify exercise requirements.
10. Revise 10 CFR Part 50, Appendix E to reflect 32 NRC 57 (1990), ALAB-935, which found that a capability must exist in order that the initial notification of the public must be conducted within about 15 minutes and that the public would then seek additional information by tuning to an emergency broadcast station.
11. Revise 10 CFR Part 50, Appendix E to reflect the actual intended use of evacuation time estimates.
12. Modify 10 CFR Part 50, Appendix E to address the principle of staged protective action.
13. Adopt the emergency planning regulations for low power operations (10 CFR 50.47 (d)) for defueled nuclear reactors.
14. Revise 50.47, 50.54 and Appendix E by deleting specific dates and/or deadlines. This was done because the dates and/or deadlines have passed, therefore, rendering them unnecessary.
15. Revise Appendix E, Section IV paragraph A5 in order to reflect proper grammar.

OGC has reviewed this proposed rule and will provide comments under separate cover. NRR obtained input from all Regional Offices and concurs with the rulemaking package. AEOD and NMSS also concurs with the rulemaking package.

For your scheduling purposes, the Commission has directed the staff to provide this rulemaking package to them by June 1, 1991.

Accordingly, if the Committee desires to review this material, your review should be completed no later than the May Full Committee meeting. However, in the past the Committee has elected to wait until public comments were received before reviewing Emergency Planning rule changes. If you prefer similar action on this package, please inform us.

This material is considered predecisional and should not be made public.

151

Eric S. Beckjord, Director
Office of Nuclear Regulatory Research

Enclosure:
Rulemaking Package

APR - 8 1991

MEMORANDUM FOR: Edward L. Jordan, Chairman
Committee to Review Generic Requirements

FROM: Eric S. Beckjord, Director
Office of Nuclear Regulatory Research

SUBJECT: PROPOSED AMENDMENTS TO 10 CFR PART 50 TO
UPDATE AND CLARIFY EMERGENCY PREPAREDNESS
REGULATIONS FOR NUCLEAR POWER PLANTS

Enclosed for review and approval by the CRGR is the subject document which the NRC staff is recommending that the Commission issue in the Federal Register for public comment.

The paper contains recommendations to the Commission for revising its regulations in 10 CFR Part 50, to update the regulations, as well as clarify ambiguities that have surfaced during the past 10 years while implementing its emergency planning regulations. In addition, changes are being proposed to the emergency planning regulations which reflect insights gained from the new source term research.

The enclosed Federal Register Notice describes each of the proposed changes which are intended to accomplish the following:

1. Revise 50.47(b) to clarify that the reasonable assurance finding is directly linked to meeting the 16 planning standards.
2. Revise 50.47, 50.54 and Appendix E to incorporate the definition and use of fundamental flaws.
3. Revise 50.47(b)(10) in order to clarify that different protective action plans and responses are appropriate for different segments of the EPZ population under different conditions.
4. Add Footnote 1 to 50.47 in order to assure that NUREG-0654 is used as a tool for evaluating emergency plans and not as a regulation.
5. Revise Appendix E to reflect that a capability to monitor 20% of the population of the EPZ in 12 hours is acceptable.
6. Revise 50.47(b)(13) and Appendix E to require only that "criteria are provided to determine under what conditions following an accident, reentry of the facility and offsite area would be appropriate, rather than "general plans".

7. Revise 50.47, 50.54 and Appendix E to reflect when the size of the EPZ can be modified as discussed in CLI-89-12.
8. Delete references to Part 70 licensees in Part 50.
9. Revise 10 CFR Part 50 Appendix E to clarify exercise requirements.
10. Revise 10 CFR Part 50, Appendix E to reflect 32 NRC 57 (1990), ALAB-935, which found that a capability must exist in order that the initial notification of the public must be conducted within about 15 minutes and that the public would then seek additional information by tuning to an emergency broadcast station.
11. Revise 10 CFR Part 50 Appendix E to reflect the actual intended use of evacuation time estimates.
12. Modify 10 CFR Part 50, Appendix E to address the principle of staged protective action.
13. Adopt the emergency planning regulations for low power operations (10 CFR 50.47(d)) for defueled nuclear reactors.
14. Revise 50.47, 50.54 and Appendix E by deleting specific dates and/or deadlines. This was done because the dates and/or deadlines have passed, therefore, rendering them unnecessary.
15. Revise Appendix E, Section IV paragraph A 5 in order to reflect proper grammar.

OGC has reviewed this proposed rule and will provide comments under separate cover. NRR obtained input from all Regional Offices and concurs with the rulemaking package. AEOD and NMSS also concur with the rulemaking package.

For your scheduling purposes, the Commission has directed the staff to provide this rulemaking package to them by June 1, 1991.

For further information contact Mike Jamgochian, RES 492-3918.

15/
Eric S. Beckjord, Director
Office of Nuclear Regulatory Research

Enclosure:
Rulemaking Package

For: The Commissioners

From: James M. Taylor
Executive Director for Operations

Subject: PROPOSED AMENDMENTS TO 10 CFR PART 50 TO UPDATE
AND CLARIFY EMERGENCY PREPAREDNESS REGULATIONS FOR
NUCLEAR POWER PLANTS

Purpose: To obtain Commission approval for publication in
the Federal Register of a proposed regulation.

Summary: This paper contains recommendations to the
Commission for revising its regulations in 10 CFR
Part 50, to update the regulations, as well as
clarify ambiguities that have surfaced during the
past 10 years while implementing its emergency
planning regulations. In addition, changes are
being proposed to the emergency planning regula-
tions which reflect insights gained from the new
source term research.

Background: On August 19, 1980, the NRC published revised
emergency planning regulations which became
effective on November 3, 1980 (45 FR 55402) and
have been revised as necessary over the years.
After 10 years experience using these revised
regulations, the staff has once again determined
that the emergency planning regulations need
updating and clarification.

In a memorandum dated June 29, 1989 from the
Executive Director for Operations to the
Commission, the staff provided an analysis and

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review of the emergency planning regulations and proposed revisions designed to eliminate ambiguity and improve clarity. In this memo, the EDO stated that the emergency preparedness regulations have been scrutinized by the staff, intervenors, Boards and the Commission in the licensing process. Although several emergency preparedness issues have been addressed by the parties and resolved, other issues could benefit from rulemaking clarification. Two of these issues relating to Part 52 licensing were addressed by the staff in SECY-90-103 (March 20, 1990) and are discussed on page 4 of this paper. The remaining issues that were identified in the June 29, 1989 memo as well as some additional issues that warrant change are addressed in this package.

Additionally, in a memorandum from the Secretary to the EDO (M900109) dated February 13, 1990, the Commission directed the staff as follows:

"With regard to emergency preparedness requirements and practices within the existing EPZ, staff should incorporate insights gained from updated source term information (e.g., fission product timing vs. prompt notification requirements, current protective action planning requirements vs. recommendations for protective actions based on revised source terms, etc.) to recommend changes to the emergency planning regulations as part of the rulemaking package to be submitted to the Commission in September 1990."

Also, in SECY 90-103, the staff identified a potential problem with the emergency planning regulations and stated that... "in the course of preparing the proposed rule, the staff has identified an additional area which may require some modification to bring the emergency planning regulations into conformance with the goals of 10 CFR 52 (i.e., resolution of issues prior to the start of construction). With assistance from OGC, the staff intends to evaluate and, if necessary, propose other appropriate changes to the emergency planning regulations in order to facilitate to the maximum possible extent resolution of emergency planning questions prior to construction. Staff will address this issue as part of the remaining work discussed in the EDO's June 29, 1989

memorandum to the Commission and approved in COMKC-89-8".

Discussion:

The topics in the three above mentioned documents fall into two categories: clarifications/updating, and new source term related information. The enclosed Federal Register Notice (Enclosure 1) describes each of the proposed changes. These changes are intended to accomplish the following:

1. Revise 50.47(b) to clarify that the reasonable assurance finding is directly linked to meeting the 16 planning standards.
2. Revise 50.47, 50.54 and Appendix E to incorporate the definition and use of fundamental flaws.
3. Revise 50.47(b)(10) in order to clarify that different protective action plans and responses are appropriate for different segments of the EPZ population under different conditions.
4. Add Footnote 1 to 50.47 in order to assure that NUREG-0654 is used as a tool for evaluating emergency plans and not as a regulation.
5. Revise Appendix E to reflect that a capability to monitor 20% of the population of the EPZ in 12 hours is acceptable.
6. Revise 50.47(b)(13) and Appendix E to require only that "criteria are provided to determine under what conditions following an accident, reentry of the facility and offsite area would be appropriate, rather than "general plans".
7. Revise 50.47, 50.54 and Appendix E to reflect when the size of the EPZ can be modified as discussed in CLI-89-12.
8. Delete references to Part 70 licensees in Part 50.
9. Revise 10 CFR Part 50, Appendix E to clarify exercise requirements.

10. Revise 10 CFR Part 50, Appendix E to reflect 32 NRC 57 (1990), ALAB-935, which found that a capability must exist in order that the initial notification of the public must be conducted within about 15 minutes and that the public would then seek additional information by tuning to an emergency broadcast station.
11. Revise 10 CFR Part 50, Appendix E to reflect the actual intended use of evacuation time estimates.
12. Modify 10 CFR Part 50, Appendix E to address the principle of staged protective action.
13. Adopt the emergency planning regulations for low power operations (10 CFR 50.47(d)) for defueled nuclear reactors.
14. Revise 50.47, 50.54 and Appendix E by deleting specific dates and/or deadlines. This was done because the dates and/or deadlines have passed, therefore, rendering them unnecessary.
15. Revise Appendix E, Section IV paragraph A 5 in order to reflect proper grammar.

One additional item which the staff considered in preparing this proposed rule change was that discussed in SECY 90-103, "Emergency Preparedness Rulemaking Relating to Part 52 Licensing for Nuclear Power Plants". In that paper, the staff attempted to deal with all of the emergency preparedness issues that could conceivably impact the granting of combined licenses under 10 CFR Part 52. Specifically, the staff proposed (1) not requiring applicants to conduct an exercise prior to issuing an operating license under Part 50 or a combined license under Part 52; and (2) extending the realism doctrine to operating reactors and for those receiving a combined license under 10 CFR Part 52.

However, in that paper the staff notified the Commission of an additional concern about the ability to resolve all emergency planning issues prior to the start of construction. The staff noted that it would work with OGC to evaluate and, if necessary, propose other appropriate changes to

the emergency planning regulations to achieve early resolution of emergency preparedness issues. The staff was concerned about its ability to make a predictive finding, many years in advance of the completion of construction, on emergency preparedness issues which may surface late in the licensing process.

OGC has advised that the solution lies in conditioning the operating license such that the predictive findings be confirmed by the results of inspections, tests and analyses which Part 52 requires the applicant to propose and which, after being approved by the NRC, are incorporated as conditions into the combined license itself. These inspections, tests, analyses and related acceptance criteria ("ITAAC") must be "necessary and sufficient" to confirm the finding. The appropriate detail to be required for design certification is the subject of SECY-90-241, dated July 11, 1990. As a result, staff is not proposing any additional changes to Part 50 or Part 52 regarding the emergency preparedness aspects of combined licenses.

Once the Commission approves this proposed rule change for publication for comment in the Federal Register, the staff plans on submitting the final rulemaking package to the Commission approximately one year thereafter.

Coordination: RES, NMSS, AEOD, and NRR have concurred in these recommendations.

OGC has reviewed this paper and will provide comments to the Commission under separate cover. FEMA (status to be added) this rulemaking activity. ACRS was sent a copy of this paper and proposed rule change and has (status to be added).

Recommendation:

That the Commission:

1. Approve a notice of proposed rulemaking (Enclosure 1).
2. Certify that this rule change, if promulgated, will not have a significant economic impact on a substantial number of small entities in order to satisfy the

requirements of the Regulatory Flexibility Act [5 U.S.C. 605 (b)].

3. Note:

- a. The proposed rule change would be published in the Federal Register for a 75 day public comment period.
- b. Appropriate Congressional committees will be notified of the proposed rule change.
- c. An environmental assessment (Enclosure 2) has been prepared, pursuant to the National Environmental Policy Act of 1969, as amended, (42 U.S.C. 84321 et. seq.) and the Commission's regulations in Subpart A of 10 CFR Part 51, and has resulted in a finding of no significant environmental impact.
- d. The Chief Counsel for Advocacy of the Small Business Administration will be informed of the certification regarding economic impact on small entities and the reasons for its implementation as required by the Regulatory Flexibility Act.
- e. The proposed rule change does not contain information requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. § 3501 et seq.). Therefore, this rule change will not be submitted to the Office of Management and Budget for review and approval of the paperwork requirements.
- f. A public announcement will be issued when the proposed rule change is filed with the Office of the Federal Register.
- g. The proposed rule change does not constitute a backfit under 10 CFR 50.109, therefore, a backfit analysis is not required.
- h. A Regulatory Analysis is included as Enclosure 3.

Sunshine Act: Recommend consideration at an open meeting.

James M. Taylor
Executive Director
for Operations

Enclosures:

1. Federal Register
 Notice of Proposed Rulemaking
2. Environmental Assessment
3. Regulatory Analysis

NUCLEAR REGULATORY COMMISSION

10 CFR Part 50

Production and Utilization Facilities;
Emergency Planning and Preparedness

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed Rule.

SUMMARY: The Nuclear Regulatory Commission is considering revising its emergency planning regulations in 10 CFR Part 50, to both update the regulations and to clarify ambiguities that have surfaced during the past 10 years while implementing regulations.

DATES: The comment period expires 75 days after publication in the Federal Register. Comments received after [end of comment period] will be considered if practical to do so, but only those comments received on or before this date can be assured of consideration.

ADDRESSES: Comments may be sent to the Secretary of the Commission, Attention, Docketing and Service Branch, U. S. Nuclear Regulatory Commission, Washington, D.C. 20555, or may be hand-delivered to One White Flint North, 11555 Rockville Pike, Rockville, MD 20852, between 7:30 a.m. and 4:15 p.m. weekdays.

Copies of comments received may be examined at the Commission's Public Document Room at 2120 L Street N.W., Washington, DC.

FOR FURTHER INFORMATION CONTACT:

Michael T. Jamgochian, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Telephone (301-492-3918); Edward M. Podolak, Jr., Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Telephone (301-492-0921).

SUPPLEMENTARY INFORMATION:

On August 19, 1980, the NRC published revised emergency planning regulations which became effective on November 3, 1980 (45 FR 55402). After 10 years of experience using these revised regulations, including consideration of additional information regarding severe reactor accidents and promulgation of 10 CFR Part 52, the Commission has determined that the emergency planning regulations need updating and clarification.

The following section summarizes the changes proposed. These changes fall into the following categories: clarifications/ updating, and those resulting from new source term related information. After each change is discussed, the Commission's

recommendation and rationale for each recommended change follows.

A. Clarifications/Updating

1. Reasonable Assurance: 10 CFR 50.47(a) require finding of "reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency." 10 CFR 50.47(b) lists the 16 planning standards that must be met by onsite and offsite plans before the Commission can make a reasonable assurance finding under 10 CFR 50.47(a). However, it has been argued that there is a separate "reasonable assurance" standard required by 10 CFR 50.47(a) over and above the 16 planning standards of 10 CFR 50.47(b). Further, the argument has been made that this "reasonable assurance" standard is more rigorous than conformance with the 16 planning standards. The D.C. Circuit Court of Appeals has recently upheld the Commission's position that the reasonable assurance finding of 50.47(a) is judged by conformity with the 16 planning standard, of 50.47(b). Massachusetts vs. NRC, No. 89-1306, slip op. at 24 (D.C. Cir. January 25, 1991), upholding Public Service Company of New Hampshire (Seabrook Station, Units 1 and 2), CLI-90-2, 31 NRC 197 (1990).

Commission Proposed Change and Rationale: Rulemaking could more explicitly forge the linkage between 10 CFR 50.47(a) and (b). 50.47(b) is revised to clarify that the reasonable assurance finding is directly linked to meeting the 16 planning standards.

2. Fundamental Flaws: Generally, litigation of the adequacy of emergency plans comes quite late in the hearing process. The opportunity to litigate shortcomings in emergency plans could be limited to those fundamental flaws. "Under NRC precedent, a fundamental flow is a deficiency that precludes the finding of reasonable assurance under 50.47(a)(1), and is confined to deficiencies that reflect a failure of an essential element of the plan that can be remedied only through a significant revision of the plan." Massachusetts vs. NRC, No. 89-1306, slip op. at 44 (D.C. Cir. January 25, 1991), citing, Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), ALAB-903, 28 NRC 499, 504-05 (1988). The D.C. Circuit continued: "We acknowledged this [fundamental flaw] concept in UCS I [UCS vs. NRC, 735 F. 2d 1437, 1446 (D.C. Circ. 1984), cert. denied, 469 U.S. 1132 (1985)] and stated that our gloss on Section 189 [of the AEA]

does not restrict the NRC's authority to adopt this substantive licensing standard." Id. at 44.

Commission Proposed Change and Rationale: Since the Appeal Board has established that the opportunity to litigate shortcomings in emergency plans surfaced in the exercises could be limited to fundamental flaws, and Federal Courts of Appeals have not restricted Commission authority to adopt such a standard, the Commission has determined that 10 CFR 50.47, 50.54 and 10 CFR Part 50 Appendix E should be clarified by incorporating the definition and use of "fundamental flaw" in evaluating onsite and offsite emergency plans.

3. Protective Actions: 10 CFR 50.47(b)(10) requires that "a range of protective actions have been developed for the plume exposure pathway EPZ for emergency workers and the public...." It has been argued that every protective action (primarily sheltering and evacuation) must be available to each person in the EPZ at every point in time. The term "range of protective actions" has not been viewed by some as allowing the flexibility in protective action decision making to consider:
 - (1) differences in circumstance, such as prisoners or hospitalized patients, who might be sheltered for low

doses rather than evacuated; (2) differences in physical facilities such as frame houses, houses without basements or the lack of concrete structures for sheltering beach goers; (3) distance from the plant; (4) offsite conditions such as severe weather or earthquake damage; or (5) accident conditions such as the source term, meteorology, and plume location.

Commission Proposed Change and Rationale: Rulemaking could clarify that the term "protective actions" is intended to communicate the concept that different protective actions might be appropriate for various segments of the EPZ population for different types of accidents, recognizing that no particular type of protective action is necessarily appropriate for every accident or for every segment of the population. Therefore, 10 CFR 50.47(b)(10) is to be revised in order to clarify that different protective actions are appropriate for different segments of the EPZ population.

4. Using NUREG-0654: Over the last 10 years it has been perceived by many in the nuclear industry that NUREG-0654 has been used inappropriately as a regulation rather than as a guidance document.

Commission Proposed Change and Rationale: Rulemaking to add a footnote to 10 CFR 50.47 would assure that NUREG-0654 is used as a tool for evaluating emergency plans and not as a regulation.

5. Monitoring of Evacuees: Regarding implementation of the "protective actions" required by 10 CFR 50.47, the guidance in NUREG-0654/FEMA-REP-1, lists as an evaluation criterion that there be a capability to register and monitor, within about a 12 hour period, all residents and transients in the plume exposure EPZ arriving at relocation centers. During the Shoreham litigation, the Appeal Board in ALAB-905 criticized FEMA's 20 percent planning basis (i.e., capability to monitor 20% of the population of the EPZ in 12 hours) as not being supported by testimony and remanded the issue for further consideration by the Licensing Board. Although this issue was resolved for that plant in the "Shoreham Director's Decision" based on site specific capabilities, the issue is likely to arise again. Rulemaking could resolve this issue generically.

Commission Proposed Change and Rationale: Criterion J.12 of NUREG-0654 states: "Each organization shall describe the means for registering and monitoring of

evacuees at relocation centers in host areas. The personnel and equipment available should be capable of monitoring within about a 12-hour period all residents and transients in the plume exposure EPZ arriving at relocation centers."

The position of NRC and the Federal Emergency Management Agency (FEMA) regarding the planning basis for monitoring evacuees from the EPZ is that there should be a capability in the offsite plans to monitor a portion of the EPZ population within about 12 hours, with provisions in the plan to expand the monitoring response base if necessary in the event of a very severe accident involving a major release of radioactive materials offsite. It is the judgment of the NRC and FEMA that detailed planning for 20 percent of the total EPZ population is an appropriate planning basis with provisions for expanding the monitoring effort if required through the use of other industry and governmental resources including the Federal capability. The actual "20 percent" value was derived by FEMA, based upon their examination of actual responses to a variety of natural and technological emergencies (including TMI-2). This value has been used by FEMA extensively and is fully supported by the

NRC as an adequate planning basis. Detailed planning for monitoring the entire EPZ population, or even a large percentage of the FPZ population, is not considered necessary or reasonable based on the extremely low probability of an accidental release of a radioactive plume moving in a relatively short time (several hours) in all directions from the plant out to 10 miles. Since the TMI-2 accident, the accepted approach to emergency planning is to take protective actions based on plant conditions before a release occurs. Initial protective actions would be focused on the close-in distances (2 to 3 miles) and at further distances only in the downwind direction (i.e., the "key-hole" concept), the area most likely to be affected by the plume. For most accidents, protective actions will be taken sufficiently far in advance, so that only a small fraction of the EPZ residents, if any, will require monitoring.

Licensing boards have generally deferred to FEMA's guidance and the NRC position that emergency plans should plan for monitoring approximately 20 percent of the total plume EPZ population. Most recently Licensing Boards for Seabrook [LBP 88-32, 28 NRC 667 (Dec. 30, 1988)] and Shoreham [LBP-88-13, 27 NRC 509

(1988)] accepted this value. (In the Seabrook case it was in the absence of any demonstration that the 20% value was inadequate.) However, the Appeal Board at Shoreham vacated the part of the licensing Board's Partial Initial Decision regarding two issues including the 20 percent monitoring planning basis. The Appeal board did not state that the 20 percent value was wrong, but stated that it was not sufficiently substantiated by FEMA or the NRC staff. Licensing Board action on this matter was pending when, on March 3, 1989, all licensing proceedings were terminated by the Commission (CLI-89-30).

Since the 20 percent value has been called into question by the Shoreham Appeal Board, the Commission believes that the issue should be resolved by rulemaking. In short, the Commission believes that the 20 percent value within about a 12 hour period is an appropriate planning basis for monitoring of the EPZ population. This is not a highly technical, or analytical judgment but a judgment on what is reasonable given the ability to expand the response. If the actual need exceeds 20 percent of the EPZ population in an accident, the State and local monitoring capabilities can be supplemented by other

nuclear utilities through umbrella agreements such as that with the Institute of Nuclear Power Operation (INPO) or by Federal agencies [primarily the Department of Energy (DOE)] through the Federal Radiological Emergency Response Plan (50 FR 46542, November 8, 1985). Furthermore, the 12 hour goal is driven by considerations of evacuee care, feeding and comfort rather than by concerns about radiological health effects. Accordingly, if the monitoring cannot be accomplished within 12 hours, even with all of the added resources, the monitoring will continue until the job is done.

Therefore, Appendix E is to be revised in order to clarify that provisions shall be made for monitoring approximately 20% of the population in the plume exposure pathway EPZ within about 12 hours of the arrival of the first evacuees at the reception center.

6. Recovery: 10 CFR 50.47(b)(13) requires that "general plans for recovery and reentry are developed." It has been argued by some that these plans need to be as sophisticated and detailed as the other aspects of emergency planning. Increased resources are being expended by State and local governments, licensees, and

applicants to develop and exercise these reentry and recovery plans that compete for resources with other more important emergency planning activities. It has also been argued that detailed recovery and reentry plans should be developed and implemented primarily by the utility and the State and local governments. In fact, recovery and reentry would occur at a later point in time after the utility and State and local initial response has been augmented with outside resources, including Federal resources. Based upon the experience of the TMI accident and the Federal Field Exercise at Zion (FFE-II), recovery and reentry would be conducted with both substantial support and considerable Federal oversight. Further, regarding recovery, 10 CFR Part 50, Appendix E.IV.H simply requires that "Criteria to be used to determine when, following an accident, reentry of the facility would be appropriate or under what conditions operation could be resumed shall be described."

Commission Proposed Changes and Rationale: Rulemaking for 10 CFR 50.47(b)(13) and Appendix E would clarify that "criteria" for recovery and reentry onsite and offsite need to be developed rather than plans and exercises. Therefore, 50.47(b)(13) and Appendix E are

to be revised to require that "criteria are provided to determine under what conditions, following an accident, reentry of the facility and evacuated offsite areas would be appropriate."

7. Size of the EPZ: The exact size and configuration of the EPZ has been questioned many times by licensees, State and local governments and petitioners for rulemaking. These questions were answered in Long Island Lighting Company (Shoreham Nuclear Power Station, Unit 1) CLI-89-12, 26 NRC 383, 394-95 (1987).

Commission Proposed Change and Rational: Rulemaking in 10 CFR 50.47, 50.54 and Appendix E would codify the findings in CLI-89-12 and be reflected in the definition of the EPZ.

8. Part 70 Licensees: When the final rule was issued on emergency preparedness for fuel cycle and other radioactive materials licensees (54 FR 14051), certain references in 10 CFR Part 50 to emergency planning requirements for Part 70 licensees should have been deleted. Section 50.54(q) currently requires that a licensee authorized to operate a fuel facility maintain an emergency plan, meeting the standards in section

50.47(b) and the requirements of Appendix E of that part. The introduction to Appendix E of Part 50 also states that the degree of compliance with the appendix by fuel facilities licensed under Part 70 will be determined on a case-by-case basis. Adequate requirements applicable to Part 70 licensees are contained in Section 70.22(i)(3). The reference to Part 70 facilities should be deleted from Part 50.

Commission Proposed Change and Rationale: In order to adequately update the regulations, references to Part 70 licensees in Part 50 are to be deleted.

9. Exercise Frequency: The requirements in 10 CFR Part 50, Appendix E, Section IV.F.3 on full or partial participation by State or local governments in the biennial (offsite) exercise are unnecessarily complicated. The Commission believes that the interval for an ingestion exposure pathway exercise should be changed from 5 to 6 years, and that the requirement that all states within the EPZ for a given site fully participate in an offsite exercise for that site at least once every 7 years should be deleted.

Commission Proposed Change and Rationale: The regulation has resulted in a relatively complicated description of the requirements for exercise participation by State and local governments who have offsite planning responsibility for more than one nuclear power plant. This includes a scheme of "full" and "partial" participation that becomes very complicated when a State or local government is within the plume exposure pathway of more than two nuclear power plants. Rulemaking could simplify and clarify this requirement. In addition, Appendix E is to be revised to reflect that the interval for an ingestion exposure pathway exercise be changed from 5 to 6 years. This matches the biennial frequency required for exercises of offsite plans. Further, Appendix E is also revised in order to eliminate the 7 year return frequency requirement because it is burdensome to States which are within the plume exposure pathway for more than three sites. Both changes will assure compatibility with FEMA requirements and thus avoid confusion among licensees and State governments.

10. Prompt Notification Capability: 10 CFR Part 50, Appendix E, Section IV.D.3 requires, among other things, that "The design objective of the prompt public

notification system shall be to have the capability to essentially complete that initial notification of the public within the plume exposure pathway EPZ within about 15 minutes." This has become a rigid standard (i.e., 15.0 minutes) which is generally required by FEMA to be demonstrated at each offsite exercise.

Commission Proposed Change and Rationale: Rulemaking would provide better clarification of what is meant by the term "about 15 minutes", as well as reflect the Appeals Board decision in Public Service Company of New Hampshire, (Seabrook Station, Units 1 and 2) ALAB-935, 32 NRC 57 (1990). The Appeal Board held that the "about 15 minute requirement in Appendix E was intended only to encompass completion of the signal that notifies the public that a radiological emergency exists so that they should take appropriate action to seek additional information (e.g., by tuning to a prescribed emergency broadcast station)." Id. at 68.

11. Evacuation Time Estimates (ETEs): 10 CFR Part 50, Appendix E, Section IV requires that the so called "ETEs" be included in the emergency plans. ETEs are intended to be used to identify potential bottlenecks during the planning process so that effective traffic

controls can be included in the plans. The ETEs may also be used by decisionmakers during an actual emergency to help the consideration of the timing based upon road conditions, time of day, and seasonal variations in population. However, the requirement to provide ETEs in the emergency plans has been interpreted by some as a requirement to meet some predetermined evacuation times. Also the precision of the ETEs has been litigated to a degree beyond their intended purpose in planning or their utility during an emergency. "The ETE is, however, only a planning tool; Commission regulations establish no particular time limits for completing an EPZ evacuation." Public Service Company of New Hampshire, (Seabrook Station, Units 1 and 2), 31 NRC 371, 408, ALAB-932 (1990), citing to, Philadelphia Electric Co. (Limerick Generating Station, Units 1 and 2), ALAB-845, 24 NRC 220, 244 (1986). "The Commission has emphasized that an adequate emergency plan is not required to achieve ... a minimum evacuation time for the EPZ in the event of a serious accident." Public Service Company of New Hampshire (Seabrook Station, Units 1 and 2), CLI-90-3, 31 NRC 219, 240 (1990), citing Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), CLI-86-13, 24 NRC 22, 30 (1986).

Commission Proposed Change and Rationale: A rulemaking clarification could return the process of developing ETEs more in line with its original purpose, i.e., to facilitate planning for traffic controls and in deciding the timing of evacuations (perhaps earlier for increased seasonal populations, inclement weather, or impending darkness). Appendix E is to be revised to reflect the actual intended use of ETEs.

12. Emergency Plans for Defueled Nuclear Reactors: In 1990, the NRC had applications from three licensees requesting approval of reduced scope emergency plans based upon the reduced risk of fuel being removed from the reactor vessel, stored at the site, and agreement that refueling would occur only with the concurrence of the NRC. These requests for approval of so-called "defueled emergency plans" are required to be processed as requests for exemption from the requirements of 10 CFR 50.47(b), i.e., the 16 planning standards. Rulemaking will standardize and simplify the process.

Commission Proposed Change and Rationale: The onsite aspects of defueled emergency plans are actually scaled down versions of the original emergency plans. For example, licensees will still maintain a Technical

Support Center and an Operational Support Center (possibly a combined facility); but each center will be manned by reduced staff with less available equipment. The emergency plan implementing procedures will be streamlined. These changes are aimed at responding to a spent-fuel accident of lower potential magnitude and complexity than a nuclear reactor accident. For example, the Emergency Action Level schemes at currently defueled plants have only two levels, the Notification of Unusual Event and the Alert. The Site Area Emergency and General Emergency action levels are not necessary because the threat to the public is so low as to preclude the EPA Protective Action Guides (PAGs) being exceeded offsite.

Offsite aspects of defueled emergency plans are dramatically different from those of an operating plant. The EPZ is reduced to the site boundary. The principal offsite features of a defueled emergency plan are notification of offsite authorities, and training of offsite personnel who may be called to assist in an emergency onsite (e.g., fire and rescue personnel). Given that EPA PAGs would not be exceeded offsite, there is no need for a near-site Emergency Operations Facility, prompt alerting and notification of the

general public, medical services for the general public, provisions for evacuation or sheltering of the general public, offsite exercises, etc. As a further consequence, there is no need for FEMA review and oversight of the offsite aspects of defueled emergency plans.

In 1979 Sandia National Laboratory completed a study looking at the effects of spent fuel heatup following a loss of water during storage (NUREG/CR-0649). In this study the minimum decay time to avoid fuel melting and cladding oxidation was calculated for low density and high density storage of spent PWR and BWR fuel, assuming a loss of water from the spent fuel storage pool. The results indicated that for low density storage a minimum decay time of 180 days (PWRs) and 80 days (BWRs) was necessary whereas for high density storage 700 days (PWRs) and 300 days (BWRs) was required. Additionally, in 1987 a spectrum of spent fuel accidents at nine nuclear power plants was analyzed by the staff to determine when, following a fuel handling accident involving a single fuel assembly, the EPA PAGs would not be exceeded at the site boundary. The data showed that approximately three weeks after shutdown, the spent fuel source term

had decayed to the point where the PAG threshold would not be exceeded in a spent fuel handling accident. The study recommended that two months of plant shutdown and subsequent relocation of fuel to the storage pool were sufficient to ensure the EPA PAG, would not be exceeded offsite. In consideration of the above, the NRC is proposing that the regulation require 180 days past shutdown before a defueled emergency plan can be implemented, in the case of low density storage, and 700 days past shutdown in the case of high density storage.

10 CFR Part 50.47(d) already addresses reduced emergency planning based upon reduced risk to the public for low-power operation. With a minor exception, these regulations mirror what the NRC believes are appropriate requirements for a defueled emergency plan. Therefore, the Commission proposes to adopt these regulations with modifications for defueled emergency plans.

13. Deadlines: Revise 50.47, 50.54 and Appendix E by deleting specific dates and/or deadlines. This was done because the dates and/or deadlines have passed, therefore, rendering them unnecessary.

Commission Proposed Change and Rational: Revise 50.47, 50.54 and Appendix E to delete unnecessary outdated dates.

14. Grammar: Revise Appendix E, Section IV paragraph A5 in order to reflect proper grammar.

B. New Source Term Related Information

1. Protective Actions within the existing EPZ.

New accident source term information has been utilized and presented in NUREG-1150. In comparison with those from the Reactor Safety Study (RSS or WASH-1400), NUREG-1150 notes:

"Overall, the comparison indicates that the source terms in the RSS were in some instances higher and in other instances lower than those in the current study. For the early containment failure accident progression bins that have the greatest impact on risk, however, the RSS source terms appear to be larger than the mean values of the current study and are typically at the upper bound of the uncertainty range."

For example, a comparison of RSS and NUREG-1150 results for a core melt with an early containment failure at the Surry plant show that the RSS release fractions or source terms are about three times greater than the mean values predicted by NUREG-1150 for the important volatile nuclides of iodine, cesium and tellurium. Although indicating that mean values of source terms for the early containment failure bins were somewhat over-estimated in the RSS, NUREG-1150 also notes the large uncertainty in these estimates. In addition, while source terms for the most severe releases may have decreased somewhat, these sequences as well as the remainder of the spectrum of accident events can, nevertheless, result in doses within the EPZ that produce early health effects or that are in excess of the PAG values.

For these reasons, the NRC considers that the size of the EPZ does not warrant any modification as a result of new source term information.

However, additional insights have been gained relative to the taking of the most effective protective actions within the existing EPZ, in the event of a severe accident. Currently, there may exist a perception that

the risk from a nuclear accident may be uniform throughout the entire 10 mile plume exposure EPZ. This perception may exist even though the Commission addressed this issue in the August 19, 1980 Emergency Planning rulemaking by stating that... "The Commission believes that the capability for quick notification within the entire plume exposure emergency planning zone should be provided but recognizes that some planners may wish to have the option of selectively actuating part of the system during actual response. Planners should carefully consider the impact of the added decisions that offsite authorities would need to make and the desirability of establishing an official communication link to all residents in the plume exposure emergency planning zone when determining whether to plan for a staged notification capability."

Commission Proposed Change and Rationale: The "staged notification capability" principle has been further expanded into the concept of staged protective actions. Research (NUREG-1150) continues to show that evacuations of two to three mile radius initiated before or shortly after the start of a release are most effective in reducing the risk of early health effects from a severe reactor accident. Evacuation of greater

distance (10 miles) early in the accident could impede the evacuation of the population near the plant, who are the greatest risk, and dilute the limited resources of offsite officials. Therefore, the concept of staged protective actions should be specifically provided for in the regulations.

The Commission, therefore, has modified Appendix E to address the principle of staged protective actions.

Summary of Proposed Changes: In conclusion, the enclosed proposed rule change are summarized as follows:

1. Revise 50.47(b) to clarify that the reasonable assurance finding is directly linked to meeting the 16 planning standards.
2. Revise 50.47, 50.54 and Appendix E to incorporate the definition and use of fundamental flaws.
3. Revise 10 CFR 50.47(b)(10) in order to clarify that different protective action plans and preparedness are appropriate for different segments of the EPZ population under different conditions.

4. Add Footnote 1 to 50.47 in order to assure that NUREG-0654 is used as a tool for evaluating emergency plans and not as a regulation.
5. Revise Appendix E to reflect that a capability to monitor 20 percent of the population of the EPZ in 12 hours is acceptable.
6. Revise 50.47(b)(13) and Appendix E to require that "criteria are provided to determine under what conditions following an accident, reentry of the facility and evacuated offsite areas would be appropriate," rather than general plans.
7. Revise 50.47, 50.54 and Appendix E to reflect when the size of the EPZ can be modified as cited in CLI-89-17.
8. Delete references to Part 70 licensees in Part 50.
9. Revise 10 CFR Part 50 Appendix E to clarify exercise requirements.
10. Revise 10 CFR Part 50, Appendix E to reflect 32 NRC 57 (1990), ALAB-935, which found that a

capability must exist in order that the initial notification of the public be conducted within about 15 minutes, and that the public would then seek additional information by tuning to an emergency broadcast station.

11. Revise 10 CFR Part 50 Appendix E to reflect the actual intended use of evacuation time estimates.
12. Modify 10 CFR Part 50 Appendix E to address the principle of staged protective action.
13. Adopt the emergency planning regulations for low power operations (10 CFR 50.47(d)) for defueled nuclear reactors.
14. Revise 50.47, 50.54 and Appendix E by deleting specific dates and/or deadlines. This was done because the dates and/or deadlines have passed, therefore, rendering them unnecessary.
15. Revise Appendix E, Section IV paragraph A 5 in order to reflect proper grammar.

FINDING OF NO SIGNIFICANT ENVIRONMENTAL IMPACT

This action is directed toward updating the emergency planning regulations as well as to clarify existing ambiguities. It does not involve any modification to any plant or revise the need or standards for emergency plans and there is no adverse affect on the quality of the environment.

The Commission has, therefore, determined that, under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in Subpart A of 10 CFR Part 51, this rule is not a major Federal action significantly affecting the quality of the environment and, therefore, an environmental impact statement not required.

The environmental assessment and finding of no significant impact on which this determination is based are available for inspection at the NRC Public Document Room, 2120 L Street, Lower Level, N.W., Washington, D.C. 20037.

Single copies of the environmental assessment and finding of no significant impact are available from Mike Jamgochian, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Telephone: (301) 492-3918.

PAPERWORK REDUCTION ACT STATEMENT

The proposed rule does not contain information requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. § 3501 et seq.). Therefore, this rule will not be submitted to the Office of Management and Budget for review and approval of the paperwork requirements.

REGULATORY ANALYSIS

The Commission has prepared a regulatory analysis on this proposed regulation. The analysis examines the costs and benefits of the alternatives considered by the Commission. The analysis is available for inspection in the NRC Public Document Room, 2120 L St., NW., Washington, D.C. 20036. Single copies of the analysis may be obtained from Michael Jamgochian, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Telephone: (301) 492-3918, Washington, D.C. 20555.

BACKFIT ANALYSIS

This amendment does not impose any new requirements on production or utilization facilities; it updates and clarifies ambiguities on the basis of experience, Federal case law, and Commission and

Appeal Board decisions. The amendment therefore is not a backfit under 10 CFR 50.109, and a backfit analysis is not required.

REGULATORY FLEXIBILITY ACT CERTIFICATION

The proposed rule will not have a significant impact on a substantial number of small entities. The proposed rule will update and clarify ambiguities in the emergency planning regulations. Nuclear power plant licensees do not fall within the definition of small business in Section 3 of the Small Business Act, 15 U.S.C. § 632, the Small Business Size Standards of the Small Business Administration in 13 CFR Part 121, or the Commission's Size Standards published at 50 FR 50241 (Dec. 9, 1985). Therefore, in accordance with the Regulatory Flexibility Act of 1980, 5 U.S.C. § 605(b), the Commission hereby certifies that the proposed rule, if promulgated, will not have a significant economic impact on a substantial number of small entities and that, therefore, a regulatory flexibility analysis need not be prepared.

List of Subjects in 10 CFR Part 50

Antitrust, Classified Information, Fire Prevention, Incorporation by Reference, Intergovernmental Relations, Nuclear Power Plants

and Reactors, Penalty, Radiation Protection, Reactor Siting Criteria, Reporting and Recordkeeping Requirements.

For the reasons set out in the preamble, and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and 5 U.S.C. 553, the NRC is adopting the following amendment to 10 CFR Part 50:

PART 50 - DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

1. The authority citation for Part 50 continues to read as follows: Authority: Secs. 102, 103, 104, 105, 161, 182, 183, 186, 189, 68 Stat. 936, 937, 938, 948, 953, 954, 955, 956, as amended, sec. 234, 83 Stat. 1244, as amended (42 U.S.C. 2132, 2133, 2134, 2135, 2201, 2232, 2233, 2236, 2239, 2282): secs. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846).

Section 50.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851). Section 50.10 also issued under secs. 101, 185, 68 Stat. 936, 955, as amended (42 U.S.C. 2131, 2235), sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332). Section 50.13 and 50.54 (dd) also issued under sec. 108, 68 Stat. 939, as amended (42 U.S.C. 2138).

Sections 50.23, 50.35, 50.55, and 50.56 also issued under sec. 185, 68 Stat. 955 (42 U.S.C. 2235). Sections 50.33a, 50.55a and Appendix Q also issued under sec. 102, Pub. L 91-190, 83 Stat. 853 (42 U.S.C. 4332). Sections 50.34 and 50.54 also issued under sec. 204, 88 Stat. 1245 (42 U.S.C. 5844). Sections 50.58, 50.91, and 50.92 also issued under Pub. L 97-415, 96 Stat. 2073 (42 U.S.C. 2239). Section 50.78 also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Sections 50.80 through 50.81 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Section 50.103 also issued under sec. 108.68 Stat. 939, as amended (42 U.S.C. 2138). Appendix F also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

For the purposes of sec. 223, 68 Stat 958, as amended (42 U.S.C. 2273): §§ 50.10(a), (b), and (c) 50.44, 50.46, 50.48, 50.54, and 50.80(a) are issued under sec. 161b, 68 Stat. 948, as amended (42 U.S.C. 2201(b): §§ 50.10(b) and (c) and 50.54 are issued under sec. 161i., 68 Stat. 949, as amended (42 U.S.C.2201(i); and §§ 50.55(e), 50.59(b), 50.70, 50.71, 50.72, 50.73, and 50.78 are issued under sec. 161o., 68 Stat 950 as amended (42 U.S.C. 2201(o).

2. 10 CFR Part 50 § 50.47 is revised to read:

§ 50.47 Emergency plans.

(a)(1) Except as provided in paragraph (d) of this section, no operating license for a nuclear power reactor will be issued unless a finding is made by NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

(2) The NRC will base its finding on a review of the Federal Emergency Management Agency (FEMA) findings and determinations as to whether State and local emergency plans are adequate and whether there is reasonable assurance that they can be implemented, and on the NRC assessment as to whether the applicant's onsite emergency plans are adequate and whether there is reasonable assurance that they can be implemented. A FEMA finding will primarily be based on a review of the plans. Any other information already available to FEMA may be considered in assessing whether there is reasonable assurance that the plans can be implemented. In any NRC licensing proceeding, a FEMA finding will constitute a rebuttable presumption on questions of adequacy and implementation capability. Plans shall provide for a flexible response to radiological emergencies and shall be determined to be adequate in the absence of a fundamental flaw, i.e., a failure of an essential element of the plan which would require the plan to be significantly revised.

~~(b) The onsite and, except as provided in paragraph (d) of this section, offsite emergency response plans for nuclear power reactors must meet the following standards:—~~The requirements of paragraphs (a) (1) and (a) (2) of this section are satisfied by onsite emergency plans and except as provided in paragraph d, offsite emergency plans which meet the following standards:

(1) Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations within the Emergency Planning Zones (EPZs) have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each

NUREG-0654, FEMA-REP-1 ("Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" Revision 1 dated March 1987) contains "evaluation criteria" which are used as an aid by FEMA and the NRC staff in evaluating emergency plans, and are not requirements.

principal response organization has staff to respond and to augment its initial response on a continuous basis.

(2) On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available and the interfaces among various onsite response activities and offsite support and response activities are specified.

(3) Arrangements for requesting and effectively using assistance resources have been made, arrangements to accommodate State and local staff at the licensee's near-site Emergency Operations Facility have been made, and other organizations capable of augmenting the planned response have been identified.

(4) A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

(5) Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and followup messages to response organizations and the public has been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway ~~Emergency Planning Zone~~ EPZ have been established.

(6) Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.

(7) Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance, and procedures for coordinated dissemination of information to the public are established.

(8) Adequate emergency facilities and equipment to support the emergency response are provided and maintained.

(9) Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency conditions are in use.

(10) ~~A range of Protective actions have been developed for the plume exposure pathway EPZ and the ingestion pathway EPZ for emergency workers and the public. Different protective actions may be provided for various segments of the EPZ's population depending on their location in the EPZ, accident projections and existing weather and road conditions. Guidelines for the choice of protective actions during an emergency, shall be included consistent with Federal guidance, are developed and be in the plan, in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed. No particular protective action are necessarily appropriate for every accident.~~

(11) Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.

(12) Arrangements are made for medical services for contaminated and injured individuals.

(13) Criteria are provided to determine under what conditions, following an accident, reentry of the facility and evacuated offsite areas would be appropriate. ~~General plans for recovery and reentry are developed.~~

(14) Periodic exercises are ~~(will be)~~ conducted to evaluate major portions of emergency response capabilities, periodic drills are ~~(will be)~~ conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are ~~(will be)~~ corrected.

(15) Radiological emergency response training is provided to those who may be called on to assist in an emergency.

(16) Responsibilities for plan development and review and for distribution of emergency plans are established, and planners are properly trained.

(c)(1) Failure to meet the applicable standards set forth in paragraph (b) of this section may result in the Commission declining to issue an operating license; however, the applicant will have an opportunity to demonstrate to the satisfaction of the Commission that deficiencies in the plans are not significant, e.g., fundamental flaws, are not identified in the plans for the plant in question, that adequate interim compensating actions have been or will be taken promptly, or that there are other compelling reasons to permit plant operations. Where an applicant for an operating license asserts that its inability to demonstrate compliance with the requirements of paragraph (b) of this section results wholly or substantially

from the decision of state and/or local governments not to participate further in emergency planning, an operating license may be issued if the applicant demonstrates to the Commission's satisfaction that:

- (i) The applicant's inability to comply with the requirements of paragraph (b) of this section is wholly or substantially the result of the nonparticipation of state and/or local governments.
- (ii) The applicant has made a sustained, good faith effort to secure and retain the participation of the pertinent state and/or local governmental authorities, including the furnishing of copies of its emergency plan.
- (iii) The applicant's emergency plan provides reasonable assurance that public health and safety is not endangered by operation of the facility concerned. To make that finding, the applicant must demonstrate that, as outlined below, adequate protective measures can and will be taken in the event of an emergency. A utility plan will be evaluated against the same planning standards applicable to a state or local plan, as listed in paragraph (b) of this section, with due allowance made both for --
 - (A) Those elements for which state and/or local non-participation makes compliance infeasible and
 - (B) The utility's measures designed to compensate for any deficiencies resulting from state and/or local non-participation.

In making its determination on the adequacy of a utility plan, the NRC will recognize the reality that in an actual emergency, state and local government officials will exercise their best efforts to protect the health and safety of the public. The NRC will determine the adequacy of that expected response, in combination with the utility's compensating measures, on a case-by-case basis, subject to the following guidance. In addressing the circumstance where applicant's inability to comply with the requirements of paragraph (b) of this section is wholly or substantially the result of non-participation of state and/or local governments, it may be presumed that in the event of an actual radiological emergency state and local officials would generally follow the utility plan. However, this presumption may be rebutted by, for example, a good faith and timely proffer of an adequate and feasible state and/or local radiological emergency plan that would in fact be relied upon in a radiological emergency.

(2) Generally, the plume exposure pathway EPZ for nuclear power plants shall consist of an area about 10 miles (16 km) in radius

and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. Adjustments to the exact size of the EPZ should be made only on the basis of such straightforward administrative considerations as avoiding EPZ boundaries that run through the middle of schools or hospitals, or that arbitrarily carve out small portions of governmental jurisdictions. The exact size and configuration of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries. The size of the EPZs also may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized power level less than 250 MW thermal. The plans for the ingestion pathway shall focus on such actions as are appropriate to protect the food ingestion pathway.

(d) Notwithstanding the requirements of paragraphs (a) and (b) of this section, and except as specified by this paragraph, no NRC or FEMA review, findings, or determinations concerning the state of offsite emergency preparedness or the adequacy of an capability to implement State and local or utility offsite emergency plans are required prior to issuance of an operating license authorizing only fuel loading or low power testing and training (up to 5 percent of the rated power). Insofar as emergency planning and preparedness requirements are concerned, a license authorizing fuel loading and/or low power testing and training may be issued after a finding is made by the NRC that the state of onsite emergency preparedness provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. The NRC will base this finding on its assessment of the applicant's onsite emergency plans against the pertinent standards in paragraph (b) of this section and Appendix E. Review of applicant's emergency plans will include the following standards with offsite aspects:

(1) Arrangements for requesting and effectively using offsite assistance on site have been made, arrangements to accommodate State and local staff at the licensee's near-site Emergency Operations Facility have been made, and other organizations capable of augmenting the planned onsite response have been identified.

(2) Procedures have been established for licensee communications with State and local response organizations, including initial notification of the declaration of emergency and periodic provision of plant and response status reports.

(3) Provisions exist for prompt communications among principal response organizations to offsite emergency personnel who would be responding onsite.

(4) Adequate emergency facilities and equipment to support the emergency response onsite are provided and maintained.

(5) Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use onsite.

(6) Arrangements are made for medical services for contaminated and injured onsite individuals.

(7) Radiological emergency response training has been made available to those offsite who may be called to assist in an emergency onsite.

e. Notwithstanding the requirements of paragraphs (a) and (b) of this section, and except as specified by this paragraph, no NRC or FEMA review, findings, or determinations concerning the state of offsite emergency preparedness or the adequacy of the capability to implement State and local or utility offsite emergency plans are required prior to authorizing reduced scope emergency planning requirements for a defueled nuclear power plant, i.e., a nuclear power plant which has been shut down for no less than 180 days for low density storage, and 700 days for high density storage, and whose fuel has been relocated to storage.

The reduced scope emergency planning and preparedness requirements for defueled nuclear power plants will be authorized after a finding is made by the NRC that the state of onsite emergency preparedness provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. The NRC will base this finding on its assessment of the applicant's onsite emergency plans against the pertinent standards in paragraph (b) of this section and Appendix E (taking into consideration the significantly reduced risk to the public health and safety). Review of applicant's emergency plans will include the following standards with offsite aspects:

- (1) Arrangements for requesting and effectively using offsite assistance onsite have been made.
- (2) Procedures have been established for licensee communications with State and local response organizations, including initial notification of the declaration of emergency and periodic provision of plant and response status reports.
- (3) Provisions exist for prompt communications among principal response organizations to offsite emergency personnel who would be responding onsite.

- (4) Adequate emergency facilities and equipment to support the emergency response onsite are provided and maintained.
- (5) Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use onsite.
- (6) Arrangements are made for medical services for contaminated and injured onsite individuals.
- (7) Radiological emergency response training has been made available to those offsite who may be called to assist in an emergency onsite.
- (8) The plume exposure pathway EPZ shall be the site boundary. There will be no ingestion exposure pathway EPZ.

3. 10 CFR Part 50 § 50.54 (q), (r), (s), (t) and (u) are revised to read:

(q) A licensee authorized to possess and operate a nuclear power reactor shall follow and maintain in effect emergency plans which meet the standards in § 50.47(b) and the requirements in Appendix E of this part. A licensee authorized to possess and/or operate a research reactor ~~or a fuel facility~~ shall follow and maintain in effect emergency plans which meet the requirements in Appendix E to this part. The licensee shall retain the emergency plan and each change that decreases the effectiveness of the plan as a record until the Commission terminates the license for the nuclear power reactor. The nuclear power reactor licensee may make changes to these plans without Commission approval only if the changes do not decrease the effectiveness of the plans and the plans, as changed, continue to meet the standards of § 50.47(b) and the requirements of Appendix E to this part. The research reactor ~~and/or the fuel facility~~ licensee may make changes to these plans without Commission approval only if these changes do not decrease the effectiveness of the plans and the plans, as changed, continue to meet the requirements of Appendix E to this part. ~~This~~ The nuclear power reactor, or research reactor, ~~or fuel facility~~ licensee shall retain a record of each change to the emergency plan made without prior Commission approval for a period of three years from the date of the change. Proposed changes that decrease the effectiveness of the approved emergency plans may not be implemented without application to and approval by the Commission. The licensee shall submit, as specified in § 50.4, a report of each proposed change for approval. If a change is made without approval, the licensee shall submit, as specified in § 50.4, a report of each change within 30 days after the change is made.

(r) Each licensee who is authorized to possess and/or operate a research or test reactor facility ~~with an authorized power level greater than or equal to 2 MW thermal~~, under a licensee of the type specified in § 50.21(c), shall submit emergency plans complying with 10 CFR Part 50, Appendix E, to the Director of the Office of Nuclear Reactor Regulation for approval ~~by September 7, 1982~~. ~~Each licensee who is authorized to possess and/or operate a research or test reactor facility with an authorized power level less than 2 MW thermal, under a license of the type specified in § 50.21(c), shall submit emergency plans complying with 10 CFR Part 50, Appendix E, to the Director of the Office of Nuclear Reactor Regulation for approval by November 3, 1982.~~

(s)(1) Each licensee who is authorized to possess and/or operate a nuclear power reactor shall submit to NRC ~~within 60 days of the effective day of this amendment~~ the radiological emergency response plans of State and local governmental entities in the United States that are wholly or partially within a plume

exposure pathway EPZ, as well as the plans of State governments wholly or partially within an ingestion pathway EPZ.

Ten (10) copies of the above plans shall be forwarded to the Director of Nuclear Reactor Regulation with 3 copies to the Administrator of the appropriate NRC regional office. Generally, the plume exposure pathway EPZ for nuclear power reactors shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. Adjustments to the exact size of the EPZ should be made only on the basis of such straightforward administrative considerations as avoiding EPZ boundaries that run through the middle of schools or hospitals, or that arbitrarily carve out small portions of governmental jurisdictions. ~~The exact size and configuration of the EPZs for a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries.~~ The size of the EPZs also may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized power level less than 250 MW thermal. The plans for the ingestion pathway EPZ shall focus on such actions as are appropriate to protect the good ingestion pathway.

(2) (i) For operating power reactors, the licensee, State, and local emergency response plans shall be implemented ~~by April 1, 1981,~~ except as provided in Section IV.D.3 of Appendix E to this part.

(ii) ~~If after April 1, 1981, the NRC finds that onsite or offsite radiological the state of emergency planning and preparedness is fundamentally flawed~~³ and does not provide

¹Emergency Planning Zones (EPZs) are discussed in NUREG-0396; EPA 520/1-78-016, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," December 1978.

²If the State and local emergency response plans have been previously provided to the NRC for inclusion in the facility docket, the applicant need only provide the appropriate reference to meet this requirement.

³A fundamental flaw is defined as a failure of an essential element of the plan which would require the plan to be significantly revised.

reasonable assurance that adequate protective measures can and will be taken as provided in 50.47(a)(b) and (c), and such condition is in the event of a radiological emergency (including findings based on requirements of Appendix E, Section IV.D.3) and if the deficiencies (including deficiencies based on requirements of Appendix E, Section IV.D.3) not corrected within four months of that finding, the Commission will determine whether the reactor shall be shut down until such fundamental flaws are deficiencies are remedied or whether other enforcement action is appropriate. In determining whether a shutdown or other enforcement action is appropriate, the Commission shall take into account, among other factors, whether the licensee can demonstrate to the Commission's satisfaction that the deficiencies fundamental flaws in the planning are not significant for the plant in question, or that adequate interim compensating actions have been or will be taken promptly, or that there are other compelling reasons for continued operation.

(3) The NRC will base its finding on a review of the FEMA findings and determinations as to whether State and local emergency plans are adequate and capable of being implemented, and on the NRC assessment as to whether the licensee's emergency plans are adequate and capable of being implemented. Nothing in this paragraph shall be construed as limiting the authority of the Commission to take action under any other regulation or authority of the Commission or at any time other than that specified in this paragraph.

(t) A nuclear power reactor licensee shall provide for the development, revision, implementation, and maintenance of its emergency preparedness program. To this end, the licensee shall provide for a review of its emergency preparedness program at least every 12 months by persons who have emergency planning training but who have no direct responsibility for implementation of the emergency preparedness program. The review shall include an evaluation for adequacy of interfaces with State and local governments and of licensee drills, exercises, capabilities, and procedures. The results of the review, along with recommendations for improvements, shall be documented, reported to the licensee's corporate and plant management, and retained for a period of five years. The part of the review involving the evaluation for adequacy of interface with State and local governments shall be available to the appropriate State and local governments.

~~(u) Within 60 days after the effective date of this amendment.~~ Each nuclear power reactor licensee shall submit to the NRC plans for coping with emergencies that meet standards in § 50.47(b) and the requirements of Appendix E to this part.

4. 10 CFR Part 50, Appendix E is revised to read as follows:

APPENDIX E-EMERGENCY PLANNING AND
PREPAREDNESS FOR PRODUCTION AND
UTILIZATION FACILITIES

Table of Contents

- I. Introduction
- II. The Preliminary Safety Analysis Report
- III. Final Safety Analysis Report
- IV. Content of Emergency Plans
- V. Implementing Procedures

I. INTRODUCTION

Each applicant for a construction permit is required by § 50.34(a) to include in the preliminary safety analysis report a discussion of preliminary plans for coping with emergencies. Each applicant for an operating license is required by § 50.34(b) to include in the final safety analysis report plans for coping with emergencies.

This appendix establishes minimum requirements for emergency plans for use in attaining an acceptable state of emergency preparedness. These plans shall be described generally in the preliminary safety analysis report and submitted as part of the final safety analysis report.

The potential radiological hazards to the public associated with the operation of research and test reactors ~~and fuel facilities~~ licensed under 10 CFR Part 50 ~~and 70~~ involve considerations different than those associated with nuclear power reactors. Consequently, the size of

Emergency Planning Zones ¹ (EPZs) for facilities other than power reactors and the degree to which compliance with the requirements of this section and sections II, III, IV, and V as necessary will be determined on a case-by-case basis.²

Notwithstanding the above paragraphs, in the case of an operating license authorizing only fuel loading and/or low power operations up to 5% of rated power, no NRC or FEMA review, findings, or determinations concerning the state of offsite emergency preparedness or the adequacy of an the capability to implement State and local offsite emergency plans, as defined in this Appendix, are required prior to the issuance of such a license.

II. THE PRELIMINARY SAFETY ANALYSIS REPORT

The Preliminary Safety Analysis Report shall contain sufficient information to ensure the compatibility of proposed emergency plans for

¹EPZs for power reactors are discussed in NUREG-0396; EPA 520/1-78-016, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," December 1978. ~~The size of the EPZs for a nuclear power plant shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries.~~ The size of the EPZs also may be determined on a case-by-case basis for gas-cooled nuclear-reactors and for ~~nuclear power plants~~ reactors with an authorized power level less than 250 MW thermal. Generally, the plume exposure pathway EPZ for nuclear power plants with an authorized power level greater than 250 MW thermal shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. Adjustments to the exact size of the EPZ should be made only on the basis of such straight forward administrative considerations as avoiding EPZ boundaries that run through the middle of schools or hospitals or that arbitrarily carve out small portions of governmental jurisdictions. The plume exposure pathway EPZ for a defueled nuclear reactor meeting the requirements of 10 CFR 50.47(e) is the site boundary.

²Regulatory Guide 2.6 will be used as guidance for the acceptability of research and test reactor emergency response plans.

both onsite areas and the EPZs, with facility design features, site layout, and site location with respect to such considerations as access routes, surrounding population distributions, land use, and local jurisdictional boundaries for the EPZs in the case of nuclear power reactors as well as the means by which the standards of § 50.47(b) will be met.

As a minimum, the following items shall be described:

- A. Onsite and offsite organizations for coping with emergencies and the means for notification, in the event of an emergency, of persons assigned to the emergency organizations.
- B. Contacts and arrangements made and documented with local, State, and Federal governmental agencies with responsibility for coping with emergencies, including identification of the principal agencies.
- C. Protective measures to be taken within the site boundary and within each EPZ to protect health and safety in the event of an accident; procedures by which these measures are to be carried out (e.g., in the case of an evacuation, who authorizes the evacuation, how the public is to be notified and instructed, how the evacuation is to be carried out); and the expected response of offsite agencies in the event of an emergency.
- D. Features of the facility to be provided for onsite emergency first aid and decontamination and for emergency transportation of onsite individuals to offsite treatment facilities.
- E. Provisions to be made for emergency treatment at offsite facilities of individuals injured as a result of licensed activities.
- F. Provisions for a training program for employees of the licensee, including those who are assigned specific authority and responsibility in the event of an emergency, and for other persons who are not employees of the licensee but whose assistance may be needed in the event of a radiological emergency.
- G. A preliminary analysis that projects the time and means to be employed in the notification of State and local governments and the public in the event of an emergency. A nuclear power plant applicant shall perform a preliminary analysis of the time required to evacuate various sectors and distances within the plume exposure pathway EPZ for transient and permanent

populations, noting major impediments to the evacuation or taking of protective actions.

- H. A preliminary analysis reflecting the need to include facilities, systems, and methods for identifying the degree of seriousness and potential scope of radiological consequences of emergency situations within and outside the site boundary, including capabilities for dose projection using real-time meteorological information and for dispatch of radiological monitoring teams within the EPZs; and a preliminary analysis reflecting the role of the onsite technical support center and of the near-site emergency operations facility in assessing information, recommending protective action, and disseminating information to the public.

III. THE FINAL SAFETY ANALYSIS REPORT

The Final Safety Analysis Report shall contain the plans for coping with emergencies. The plans shall be an expression of the overall concept of operation; they shall describe the essential elements of advance planning that have been considered and the provisions that have been made to cope with emergency situations. The plans shall incorporate information about the emergency response roles of supporting organizations and offsite agencies. That information shall be sufficient to provide assurance of coordination among the supporting groups and with the licensee. The plans submitted must include a description of the elements set out in Section IV for the Emergency Planning Zones (EPZs) to an extent sufficient to demonstrate that the plans provide reasonable assurance that adequate protective measures can and will be taken in the event of an emergency.

IV. CONTENT OF EMERGENCY PLANS

The applicant's emergency plans shall contain, but not necessarily be limited to, information needed to demonstrate compliance with the elements set forth below, i.e., organization for coping with radiation emergencies, assessment action, activation of emergency organization, notification procedures, emergency facilities and equipment, training, maintaining emergency preparedness, and recovery. In addition, the emergency response plans submitted by an applicant for a nuclear power reactor operating license shall contain information needed to demonstrate compliance with the standards described in § 50.47(b), and they will be evaluated against those standards. The nuclear power reactor operating license applicant shall also provide an analysis of the time required to evacuate and for taking other protective actions for various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations. The analyses are to be used to facilitate

planning for traffic controls and to aid in determining protective actions for various portions of the EPZ population considering the location the population, accident projections, and potential road and weather conditions.

A. Organization

The organization for coping with radiological emergencies shall be described, including definition of authorities, responsibilities, and duties of individuals assigned to the licensee's emergency organization and the means for notification of such individuals in the event of an emergency. Specifically, the following shall be included:

1. A description of the normal plant operating organization by position and function.
2. A description of the onsite emergency response organization with a detailed discussion of:
 - a. Authorities, responsibilities, and duties of the individual(s) who will take charge during an emergency;
 - b. Plant staff emergency assignments;
 - c. Authorities, responsibilities, and duties on an onsite emergency coordinator who shall be in charge of the exchange of information with offsite authorities responsible for coordinating and implementing offsite emergency measures.
3. A description, by position and function to be performed, of the licensee's headquarters personnel who will be sent to the plant site to augment the onsite emergency organization.
4. Identification, by position and function to be performed, of persons within the licensee organization who will be responsible for making offsite dose projections, and a description of how these projections will be made and the results transmitted to State and local authorities, NRC, and other appropriate governmental entities.
5. Identification, by position and function to be performed, of other employees of the licensee with special qualifications for coping with emergency conditions that may arise. Other persons organizations with special qualifications, such as consultants, who are not employees of the licensee and who may be called upon for assistance for emergencies shall also be identified. The

special qualifications of these ~~persons~~ organizations shall be described.

6. A description of the local offsite services to be provided in support of the licensee's emergency organization.
7. Identification of, and assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies.
8. Identification of the State and/or local ~~officials~~ agencies responsible for planning for, ordering, and controlling appropriate protective actions, including evacuations when necessary.

B. Assessment Actions

The means to be used for determining the magnitude of and for continually assessing the impact of the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. These emergency action levels shall be discussed and agreed on by the applicant and State and local governmental authorities and approved by NRC. They shall also be reviewed with the State and local governmental authorities on an annual basis. These emergency action levels may be summarized in the emergency plan but shall be enumerated in the implementing procedures for the emergency plan.

C. Activation of Emergency Organization

The entire spectrum of emergency conditions that involve the alerting or activating of progressively larger segments of the total emergency organization shall be described. The communication steps to be taken to alert or activate emergency personnel under each class of emergency shall be described. Emergency action levels (based not only on onsite and offsite radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, such as the pressure in containment and the response of the Emergency Core Cooling System) for notification of offsite agencies shall be described. Describe plans to verify message authentication. ~~The existence, but not the details, of a message authentication scheme shall be noted for such~~

agencies.—The emergency classes defined shall include: (1) notification of unusual events, (2) alert, (3) site area emergency, and (4) general emergency. These classes are further discussed in NUREG-0654; FEMA-REP-1.

D. Notification Procedures

1. Administrative and physical means for notifying local, State, and Federal officials and agencies and agreements reached with these officials and agencies for the prompt notification of the public and for public evacuation or other protective measures, should they become necessary, shall be described. This description shall include identification of the appropriate officials, by title and agency, of the State and local government agencies within the EPZs.³

2. Provisions shall be described for yearly dissemination to the public within the plume exposure pathway EPZ of basic emergency planning information, such as the methods and times required for public notification and the protective actions planned if an accident occurs, general information as to the nature and effects of radiation, and a listing of local broadcast stations that will be used for dissemination of information during an emergency. Means shall exist to disseminate helpful information to the transient plume exposure EPZ population in event of an accident. ~~Signs or other Measures shall be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an accident occurs.~~

3. A licensee shall have the capability to notify responsible State and Local governmental agencies within 15 minutes after declaring an emergency. ~~The licensee shall demonstrate that the State/local officials have the capability to make a public notification decision promptly on being informed by the license of an emergency condition.~~ Provisions shall exist for the state/local officials to make a public notification decision promptly on being informed by the licensee of an emergency condition. By February 1, 1982 Each nuclear power reactor licensee shall demonstrate that administrative and physical means have been established for alerting and providing prompt instructions to the public within the plume exposure pathway EPZ. ~~The four month period in 10 CFR 50.54(s)(2) for the correction of emergency plan deficiencies shall not apply to the initial installation of this public notification system, that is required by February 1, 1982. The four month period of emergency planning deficiencies will apply to correction of deficiencies identified during the initial installation and testing of the prompt public~~

³See footnote 1 to section I.

~~notification systems as well as those deficiencies discovered thereafter.~~ The design objective of the prompt public notification system shall be to have the capability to essentially complete the initial notification of the public within the plume exposure pathway EPZ within about 15 minutes after a decision is made by offsite officials that the public should be notified. The public should then take appropriate action to seek additional information (e.g., by tuning to a prescribed emergency broadcast station). The use of this notification capability will range from immediate notification of the public (within 15 minutes of the time that State and local officials are notified that a situation exists requiring urgent action) to the more likely events where there is substantial time available for the State and local governmental officials to make a judgment whether or not to activate the public notification system. Whether there is a decision to activate the notification system, the State and local officials will determine whether to activate the entire notification system simultaneously or in a graduated or staged manner. Additionally, the State and local governments may use staged protection action strategies outlined in current federal guidance. The responsibility for activating such a public notification system shall remain with the appropriate governmental authorities.

E. Emergency Facilities and Equipment

Adequate provisions shall be made and described for emergency facilities and equipment, including:

1. Equipment at the site for personnel monitoring;
2. Equipment for determining the magnitude of and for continuously assessing the impact of the release of radioactive materials to the environment;
3. Facilities and supplies at the site for decontamination of onsite individuals;
4. Facilities and medical supplies at the site for appropriate emergency first aid treatment;
5. Arrangements for the services of physicians and other medical personnel qualified to handle radiation emergencies on-site;
6. Arrangements for transportation of contaminated injured individuals from the site to specifically identified treatment facilities outside the site boundary;

7. Arrangements for treatment of individuals injured in support of licensed activities on the site at treatment facilities outside the site boundary;
8. A licensee onsite technical support center and a licensee near-site emergency operations facility from which effective direction can be given and effective control can be exercised during an emergency.
9. At least one onsite and one offsite communications system; each system shall have a backup. ~~power source~~
10. Provision for monitoring within about 12 hours of the arrival of the first evacuees at the reception center approximately 20 percent of the population who may be evacuated from the plume exposure EPZ.

All communication plans shall have arrangements for emergencies, including titles and alternates for those in charge at both ends of the communication links and the primary and backup means of communication. Where consistent with the function of the governmental agency, these arrangements will include:

- a. Provision for communications with contiguous State/local governments within the plume exposure pathway EPZ. Such communications shall be tested monthly.
- b. Provision for communications with Federal emergency response organizations. Such communications systems shall be tested annually.
- c. Provision for communications among the nuclear power reactor control room, the onsite technical support center, and the near-site emergency operations facility; and among the nuclear facility, the principal State and local emergency operations centers, and the field assessment teams. Such communications systems shall be tested annually.
- d. Provisions for communications by the licensee with NRC Headquarters and the appropriate NRC Regional Office Incident Response Center from the nuclear power reactor control room, the onsite technical support center, and the near-site emergency operations facility. Such communications shall be tested monthly.

F. Training

1. The program to provide for (1) the training of employees and exercising, by periodic drills, of radiation emergency plans to ensure that employees of the licensee are familiar with their specific emergency response duties, and (2) the participation in the training and drills by other persons whose assistance may be needed in the event of a radiation emergency shall be described. This shall include a description of specialized initial training and periodic retraining programs to be provided to each of the following categories of emergency personnel:

- a. Directors and/or coordinators of the plant emergency organization;
- b. Personnel responsible for accident assessment, including control room shift personnel;
- c. Radiological monitoring teams;
- d. Fire control teams (fire brigades);
- e. Repair and damage control teams;
- f. First aid and rescue teams;
- g. Medical support personnel;
- h. Licensee's headquarters support personnel;
- i. Security personnel.

In addition, a radiological orientation training program shall be made available to local services personnel; e.g., local emergency services/Civil Defense, local law enforcement personnel, local news media persons.

2. The plan shall describe provisions for the conduct of emergency preparedness exercises as follows: Exercises shall test the adequacy of timing and content of implementing procedures and methods, test emergency equipment and communications networks, test the public notification system, and ensure that emergency organization personnel are familiar with the duties.⁴

⁴Use of site specific simulators or computers is acceptable for any exercise.

- a. A full participation⁵ exercise which tests as much of the licensee, State and local emergency plans as is reasonably achievable without mandatory public participation shall be conducted for each site at which a power reactor is located, ~~for which the first operating license for that site is issued after July 13, 1982.~~ This exercise shall be conducted within two years before the issuance of the first operating license for full power (one authorizing operation above 5% of rated power) of the first reactor and shall include participation by each State and local government within the plume exposure pathway EPZ and each State within the ingestion exposure pathway EPZ. If the full participation exercise is conducted more than one year prior to issuance of an operating licensee for full power, an exercise which tests the licensee's onsite emergency plans shall be conducted within one year before issuance of an operating license for full power. This exercise need not have offsite authority ~~State or local government~~ participation.
- b. Each licensee at each site shall annually exercise the onsite ~~its~~ emergency plan.

~~Each licensee at each site shall exercise with offsite authorities such that the State and local government emergency plans for each operating reactor site are exercised biennially, with full or partial participation⁶ by State and local governments, within the plume exposure pathway EPA. State and local governments that have fully participated in a joint~~

⁵"Full participation" when used in conjunction with emergency preparedness exercises for a particular site means appropriate offsite local and State authorities and licensee personnel physically and actively take part in testing their integrated capability to adequately assess and respond to an accident at a commercial nuclear power plant. "Full participation" includes testing the major observable portions, listed herein, of the onsite and offsite emergency plans and mobilization of State, local and licensee personnel and other resources in sufficient numbers to verify the capability to respond to the accident scenario.

⁶"Partial participation" when used in conjunction with emergency preparedness exercises for a particular site means appropriate offsite authorities shall actively take part in the exercise sufficient to test direction and control functions; i.e., (a) protective action decision making related to emergency action levels, and (b) communication capabilities among affected State and local authorities and the licensee.

~~exercise since October 1, 1982, are eligible to fully participate in emergency preparedness exercises on a biennial frequency. The level of participation shall be as follows:~~

- ~~a. A State shall at least partially participate in each offsite exercise every 2 years.~~
- ~~b. A State shall fully participate in at least one offsite exercise every 2 years.~~
- ~~c. At least once every 7 years, all States within the plume exposure pathway EPA for a given site must fully participate in an offsite exercise for that site. This exercise must also involve full participation by local governments within the plume exposure pathway EPA.~~
- ~~d. Partial participation by a local government during an offsite exercise for a site is acceptable only when the local government is fully participating in a biennial exercise at another site.~~
- c. Each State within any ingestion exposure pathway EPZ shall exercise its plans and preparedness related to ingestion exposure pathway measures at least once every 5 6 years.
- d. Offsite plans for each site shall be exercised biennially with each offsite authority having a role under the plan. Where the offsite authority has a role under more than one radiological response plan it shall fully participate in one exercise every two years and shall, at least, partially participate in other offsite plan exercises, in such period. Offsite authorities shall endeavor to rotate their full participation in exercises among various sites.
- e. Licensees shall allow any ~~enable any~~ State or local government located within the plume exposure pathway EPZ to participate in annual exercises when requested by such State or local government.
- f. Remedial exercises will be required if the offsite emergency plan is not satisfactorily tested during the biennial exercise, such that NRC, in consultation with FEMA, ~~cannot find reasonable assurance that adequate protective measures can be taken in the event to a radiological emergency. The extent of State and local participation in remedial exercises must be sufficient to show that appropriate corrective measures have been taken regarding the elements of the plan not properly tested in~~

~~the previous exercises.~~ finds fundamental flaws in offsite plans and preparedness i.e., a failure of an essential element of the plan which would require the plan to be significantly revised.

- g. Remedial exercises will be required if the onsite emergency plan is not satisfactorily tested during the annual exercise, such that the NRC finds fundamental flaws in onsite emergency plans and preparedness.
- h. All training, including exercises, shall provide for formal critiques in order to identify weak or deficient areas that need correction. Any weaknesses or deficiencies that are identified shall be corrected.
- i. The participation of state and local governments in an emergency exercise is not required to the extent that the applicant has identified those governments as refusing to participate further in emergency planning activities, pursuant to 10 CFR 50.47(c)(1) or 50.54. In such cases, an exercise shall be held with the applicant or licensee and such governmental entities as elect to participate in the emergency planning process.

G. Maintaining Emergency Preparedness

Provisions to be employed to ensure that the emergency plan, its implementing procedures, and emergency equipment and supplies are maintained up to date shall be described.

H. Recovery

Criteria to be used to determine under what conditions, following an accident, reentry of the facility and evacuated offsite areas would be appropriate ~~or when operation could be resumed~~ shall be described.

V. IMPLEMENTING PROCEDURES

No less than 180 days prior to the scheduled issuance of an operating license for a nuclear power reactor or a license to possess nuclear material the applicant's detailed implementing procedures for its emergency plan shall be submitted to the Commission as specified in § 50.4. Licensees who are authorized to operate a nuclear power facility

shall submit any changes to the emergency plan or procedures to the Commission, as specified in § 50.4, within 30 days of such changes.

Dated at Rockville, Maryland, this _____ day of _____, 1991 for the Nuclear Regulatory Commission.

Samuel J. Chilk
Secretary of the Commission

Environmental Assessment for Proposed Amendments to 10 CFR Part 50 to Update and Clarify Emergency Preparedness Regulations for Nuclear Power Plants.

Identification of the Action

The Nuclear Regulatory Commission is considering revising its regulations in 10 CFR Part 50 to update as well as clarify ambiguities that have surfaced during the past 10 years while implementing its emergency planning regulations. In addition, changes are being proposed to the emergency planning regulations which reflect insights gained from the new source term research.

1. Revise 50.47(b) to clarify that the reasonable assurance finding is directly linked to meeting the 16 planning standards.
2. Revise 50.47, 50.54 and Appendix E to incorporate the definition and use of fundamental flaws.
3. Revise 50.47(b)(10) in order to clarify that different protective action plans and responses appropriate for different segments of the EPZ population.
4. Add Footnote 1 to 50.47 in order to assure that NUREG-0654 is used as a tool for evaluating emergency plans and not as a regulation.
5. Revise Appendix E to reflect that a capability to monitor 20% of the population of the EPZ in 12 hours is acceptable.
6. Revise 50.47(b)(13) and Appendix E to require only that "criteria are provided to determine under what conditions following an accident, reentry of the facility and offsite area would be appropriate, rather than "general plans".
7. Revise 50.47, 50.54 and Appendix E to reflect when the size of the EPZ can be modified as discussed in CLI-89-12.
8. Delete references to Part 70 licensees in Part 50.
9. Revise 10 CFR Part 50 Appendix E to clarify exercise requirements.
10. Revise 10 CFR Part 50, Appendix E to reflect 32 NRC 57 (1990), ALAB-935, which found that a capability must exist in order that the initial notification of the public must be conducted within about 15 minutes and

that the public would then seek additional information by tuning to an emergency broadcast station.

11. Revise 10 CFR Part 50 Appendix E to reflect the actual intended use of evacuation time estimates.
12. Modify 10 CFR Part 50 Appendix E to address the principle of staged protective action.
13. Adopt the emergency planning regulations for low power operations (10 CFR 50.47(d)) for defueled nuclear reactors.
14. Revise 50.47, 50.54 and Appendix E by deleting specific dates and/or deadlines. This was done because the dates and/or deadlines have passed, therefore, rendering them unnecessary.
15. Revise Appendix E, Section IV paragraph A 5 in order to reflect proper grammar.

The Need for the Actions

On August 19, 1980, the NRC published revised emergency planning regulations which became effective on November 3, 1980 (45 FR 55402) and have been revised as necessary over the years. After 10 years experience using these revised regulations, including consideration of additional information regarding severe reactor accidents and promulgation of 10 CFR Part 52, the Commission has determined once again that the emergency planning regulations need updating and clarification.

Alternations Considered

3. ALTERNATIVES

The following are the alternatives considered in this regulatory analysis.

3.1 No Change

This alternative would continue the status quo by making no change in the current regulations governing radiological emergency preparedness in the vicinity of nuclear power plants.

3.2 Revise the Regulations

This alternative would be to revise the regulations in 10 CFR Part 50 and its Appendix E in eleven distinct areas. The proposed revisions are:

Reasonable Assurance

10 CFR 50.47(a) requires that NRC makes a finding that "there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency" before an operating license for a nuclear power reactor can be issued. 10 CFR 50.47(b) lists 16 standards that offsite emergency response plans must meet. This proposed revision would forge the link between the two subsections by revising 10 CFR 50.47(a) to provide that meeting the 16 planning standards of 10 CFR 50.47(b) is the evidence required to find that the "reasonable assurance" standard has been met.

Definition and Use of Fundamental Flaws

This proposed revision would revise 10 CFR 50.54(s)(2)(ii) to adopt the definition of fundamental flaw developed by the Atomic Licensing and Safety Appeal Board reported in ALAB-903, namely, "an essential failing in any of the planning standards listed in 50.47(b) which can only be corrected through a significant revision to the emergency plan." The proposed revision would use this definition as follows:

1. In 10 CFR 50.54(s)(2)(ii), the condition that could trigger a reactor being shutdown or another enforcement action being taken would be whether a fundamental flaw is corrected within 4 months of a finding. Currently, the condition that could trigger these actions is that a deficiency is not corrected within 4 months of a finding.

2. In Section F.4 of Appendix E to 10 CFR Part 50, the condition that would trigger a remedial exercise if an emergency plan is not satisfactorily exercised during a biennial exercise would be that NRC, in consultation with FEMA, finds fundamental flaws in such plans and preparedness. Currently the condition that triggers a remedial exercise is that NRC in consultation with FEMA "cannot find reasonable assurance that adequate protective measures can be taken in the event of a radiological emergency" (i.e., there be a finding of a deficiency).

Range of Protective Actions

The proposed revision would clarify the meaning of the phrase "range of protective actions" by adding to 10 CFR 50.47(b)(10) the phrase "Note that different protective actions may be appropriate for various segments of the EPZ population for different types of accidents and that no particular type of protective action is necessarily appropriate for every accident for every segment of the EPZ."

NUREG-0654

This proposed revision would add a footnote to 50.47 in order to assure that NUREG-0654 is used as a tool for evaluating emergency plans and not as a regulation.

Monitoring of Evacuees

This proposed revision would adopt FEMA's 20% planning basis and would modify 10 CFR 50.47(b)(10) to reflect that a capability to monitor 20% of the population in the plume exposure EPZ within 12 hours of arrival at reception centers is acceptable. In Section 4.4, the consequences of requiring a greater monitoring capability are discussed briefly.

Recovery and Reentry

This proposed revision would resolve the inconsistency between 10 CFR 50.47(b)(13), which requires that general plans for recovery and reentry be developed, and Section IV.H of Appendix E of 10 CFR Part 50, which requires only that criteria be described, by revising 10 CFR 50.47(b)(13) to read "Criteria are developed to determine under what conditions, following an accident, reentry of the facility and offsite area are appropriate". Section IV.H of Appendix E would be modified to repeat this language. In Section 4.5, the consequences of requiring general plans for recovery and reentry are discussed briefly.

Reference to Part 70 Licensees in Part 50

To preclude conflicts with 10 CFR Part 70, this proposed revision would delete all references to "fuel facilities" and Part 70 licensees from 10 CFR Part 50.

Exercise Frequency

This proposed revision would delete the provisions currently in Section IV.F.3 of Appendix E to 10 CFR Part 50, which govern State and local government participation in offsite radiological preparedness exercises, and would replace them with offsite plans for each site shall be exercised biennially with each offsite authority having a role under the plan. Where the offsite authority has a role under more than one radiological response plan it shall fully participate in one exercise every two years and shall, at least, partially participate in other offsite plan exercises, in such period. Offsite authorities shall endeavor to rotate their full participation in exercises among various sites.

Initial Notification of the Public

Section IV.D.3 to Appendix E of 10 CFR Part 50 currently provides, among other things, that "the design objective of the

provides, among other things, that "the design objective of the prompt public notification system shall be to have the capability to essentially complete the initial notification of the public within the plume exposure pathway EPZ within about 15 minutes." This proposed revision would add "after a decision is made by offsite officials that the public should be notified. The public should then take appropriate action to seek additional information (e.g., by tuning to a prescribed emergency broadcast station."

Evacuation Time Estimates

This proposed revision would clarify the intended use of evacuation time estimate analyses that are included in emergency response plans by adding the following sentence to Section IV of Appendix E of 10 CFR Part 50. The analyses are to be used to facilitate planning for traffic controls and to aid in determining protective actions for various portions of the EPZ population considering the location the population, accident projections, and potential road and weather conditions.

Staged Notification Capability

This proposed revision would revise Section IV.D to Appendix E of 10 CFR Part 50 to explicitly "encourage State and local governments to use staged protective action strategies outlined in current federal guidance. The protective action strategies outlined in this document augment the protective action strategies contained in Appendix 1 of NUREG-0654/FEMA-REP-1, Rev. 1 with 4 conclusions based on new source term information.

Emergency Plans for Defueled Nuclear Reactors

In 1990, the NRC had applications from 3 licensees requesting approval of reduced scope emergency plans based upon the reduced risk of fuel being out of the reactor vessel for some time and stored at the site. These requests for approval of so-called "defueled emergency plans" are required to be processed as a request for exemptions from the requirements of 10 CFR 50.47(b) i.e., the 16 planning standards. Rulemaking will standardize and simplify the process.

Environmental Impacts of the Action

The proposed rule changes do not require any physical changes to the plant and do not change in any way the plant operating characteristics, discharges to the environment or likelihood or consequences of accidents.

Accordingly, based on the above, implementation of this rulechange will not adversely affect the quality of the environment.

Agencies and Persons Consulted

The Federal Emergency Management Agency has been notified of this change. This proposed change is to be published in the Federal Register for all interested parties to comment on. All comments received within the stated time limit will be considered in developing a final rule.

Finding of No Significant Impact

Based on the above, the Commission finds that there will be no significant impact on the environment as the result of the implementation of the proposed rule change and concludes that an environmental impact statement is not required for this proposed rulechange.

DRAFT - DO NOT CITE

REGULATORY ANALYSIS:
PROPOSED AMENDMENTS TO 10 CFR PART 50 TO
UPDATE AND CLARIFY EMERGENCY PREPAREDNESS REGULATIONS
FOR NUCLEAR POWER PLANTS

MARCH 1991

ENCL 3

ABSTRACT

In 1980, the U.S. Nuclear Regulatory Commission (NRC) promulgated regulations concerning emergency planning and preparedness for radiological emergencies involving nuclear power plants. In nearly ten years of experience, it has become apparent that certain provisions do not clearly express the intent of the Commission and are in need of clarification. Also, since 1980, additional source term information makes it appropriate to update other provisions.

The provisions needing clarification include those dealing with: the relationship between the "reasonable assurance" standard and the 16 planning standards; the definition and use of fundamental flaws; the range of protective actions; the capability to radiologically monitor evacuees; recovery and reentry; references to fuel facilities (Part 70 licensees) in 10 CFR Part 50; the prompt notification capability; and offsite exercise frequency. The provision needing updating because of new source term information deals with use of the staged notification capability. It is also appropriate to add a rule concerning emergency plans for defueled nuclear reactors.

NRC is proposing amendments to its regulations in 10 CFR Part 50 and its Appendix E in the above-cited areas. The proposed revisions would not change current practice in radiological emergency response plans and preparedness but would have the beneficial effect of improving regulatory efficiency by making it less likely that spurious issues would be raised in licensing proceedings.

REGULATORY ANALYSIS
PROPOSED AMENDMENTS TO 10 CFR PART 50 TO
UPDATE AND CLARIFY EMERGENCY PREPAREDNESS REGULATIONS
FOR NUCLEAR POWER PLANTS

1. STATEMENT OF THE PROBLEM

On August 19, 1980, the NRC published revised emergency planning regulations which became effective on November 3, 1980 (45 FR 55402). These regulations are found in 10 CFR 50.47, 10 CFR 50.54, and Appendix E to 10 CFR Part 50. In nearly ten years of experience, in which these regulations have been scrutinized by NRC staff, intervenors and Boards in licensing proceedings, and the Commission, it has become apparent that certain provisions do not clearly express the intent of the Commission and are in need clarification. The many issues that have been raised in licensing proceedings are evidence of this lack of clarity. Also, since 1980, additional source term information (e.g., timing of prompt notification of the public and protective actions relative to when radionuclides are released from the plant) makes it appropriate to update other provisions in the regulations. Overall fifteen revisions are appropriate.

L1 Provisions Needing Clarification

Experience has shown that the following clarifications are needed:

- 1) 10 CFR 50.47(a) requires that NRC makes a finding that "there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological

emergency" before an operating license for a nuclear power reactor can be issued.

10 CFR 50.47(b) lists 16 standards that offsite emergency response plans must meet.

Because the requirement for "reasonable assurance" and the requirement for 16 planning standards being met are in different subsections of 10 CFR 50.47, the argument has been made that they are separate requirements and that the "reasonable assurance" standard is higher and more rigorous than conformance with the 16 planning standards. There is need to clarify the original intent of the Commission that the "reasonable assurance" standard is satisfied when the 16 planning standards are met.

2) Litigation^{1,2} has shown that the regulations might be amended to provide that only matters material to licensing (i.e., "fundamental flaws" in emergency response planning and preparedness) can be litigated in the hearing process. It would then be appropriate to revise the regulations to define fundamental flaws and to specify how fundamental flaws are to be used.

3) 10 CFR 50.47(b)(10), one of the 16 planning standards for offsite emergency response plans, requires that "a range of protective actions have been developed for the plume exposure pathway EPZ for emergency workers and the public." The intent of the term "range of protective actions" is to allow decisionmakers flexibility in deciding which are appropriate protective actions in view of circumstances. It allows these decisionmakers to consider: the mobility of special populations (e.g., nursing home residents); differences in the availability of physical facilities for sheltering; distance from the nuclear power plant; offsite

conditions such as ice, snow, flooding, or earthquake damage; and accident conditions such as the composition and intensity of the radiological release, meteorology, and plume location. However, the provision allows an interpretation that every protective action (primarily sheltering and evacuation) must be available to each person in the emergency planning zone (EPZ) at all times. Intervenors in licensing proceedings have advocated for this later meaning. Clarification that the entire spectrum of protection actions need not be available for every accident for every segment of the plume exposure EPZ is needed.

4) In 1980, NRC and the Federal Emergency Management Agency (FEMA) jointly published "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and preparedness in Support of Nuclear Power Plants", NUREG-0654/FEMA-REP-1, Rev. I (NUREG-0654)³. As stated in its introduction, the purpose of NUREG-0654 is to provide" a guidance source for (1) State and local governments and nuclear facility operators in the development of radiological response plans and preparedness in support of nuclear power plants; (2) FEMA, NRC, and other Federal agency personnel engaged in the review of State, local government and licensee plans and preparedness..." For each of the 16 planning standards of Section 50.47(b), NUREG-0654 contains several evaluation criteria. However, over the last 10 years, it has been perceived by many in the nuclear industry that NUREG-0654 has been used inappropriately as a regulation rather than as a guidance document. Clarification as to the intended use of NUREG-0654 is needed.

5) Radiological emergency response plans provide for evacuees from the plume exposure EPZ to go to facilities, usually called "reception centers", to be monitored for radiological contamination. The regulations do not address what percentage of the plume exposure EPZ population reception centers should have the capability to monitor in a timely manner. FEMA has adopted a 20% planning basis (i.e., that reception centers have the capability to monitor 20% of the plume exposure EPZ population within 12 hours of arrival). Most recently, Licensing Boards for Seabrook (LBP 88-32) and Shoreham⁴ (LBP 88-13) accepted this value. However, the 20% planning basis was criticized by the Atomic Safety and Licensing Appeal Board in the course of Shoreham litigation in ALAB-905 as not being supported by evidence in the record and the issue was remanded. Licensing Board action on this matter was pending when, on March 3, 1989, all licensing proceedings for Shoreham were terminated by the Commission. However, because of conflict between the plain language of evaluation criterion J.12 in NUREG-0654 and the 20% planning basis, the issue can be expected to arise again. Therefore, the regulations should explicitly address this question before it arises again.

6) 10 CFR 50.47(b)(13), one of the 16 planning standards for offsite emergency response plans, requires that "general plans for recovery and reentry are developed." Section IV of Appendix E to 10 CFR Part 50, "Content of Emergency Plans" discusses what must be contained in offsite emergency response plans to be in compliance with the planning standards of 10 CFR 50.47(b). With respect to recovery and reentry, Section IV.H states only "Criteria to be used to determine when, following an accident, reentry of the facility would be appropriate or when operation could be resumed shall be described." Thus, there appears to an

inconsistency between 10 CFR 50.47(b), which requires that general plans for recovery and reentry be developed and Appendix E, which requires that only criteria be described. This inconsistency should be resolved.

7) The exact size and configuration of the plume exposure EPZ (sometimes referred to as the "10-mile EPZ") has been questioned many times by licensees, State and local governments, and petitioners for rulemaking. In a proceeding associated with Shoreham (CLI-89-12), these questions were answered. There could be adjustments to the exact size of the plume exposure EPZ only on the basis of such straightforward administrative considerations as avoiding EPZ boundaries that run through the middle of schools or hospitals, or that arbitrarily carve out small portions of governmental jurisdictions.

This decision should be codified.

8) 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material", contains regulations that establish procedures and criteria for the issuance of licenses to receive title to, own, acquire, deliver, receive, possess, use, and initially transfer special nuclear material. It also establishes and provides for the terms and conditions upon which such licenses will be issued. "Special nuclear material" is defined in 10 CFR 70.4(m) to mean, in part, plutonium, uranium-233, and uranium enriched in the isotope 233 or in the isotope 235. 10 CFR 70.22(i) provides that an application for a license to possess and use special nuclear material for processing, scrap recovery, or conversion of uranium hexafluoride must contain plans for coping

with emergencies. Furthermore, footnote 3 in 10 CFR 70.22(i) provides that such an emergency plan shall contain the elements that are listed in Section IV of Appendix E to Part 50. Approval of an application for a Part 70 license is inherently done on a case-by-case basis. Currently, 10 CFR 50.54(q) requires that a licensee authorized to operate a fuel facility maintain an emergency plan that meets the requirements of Appendix E of Part 50. This reference to Part 70 licensees in Part 50 is confusing and possibly in conflict with Part 70 (e.g., the term "fuel facility" is not defined). The possible conflicts between Part 50 and Part 70 should be resolved.

9) Section IV.F.3 of Appendix E to 10 CFR Part 50 contains the requirements imposed on State and local governments for participation in offsite radiological emergency preparedness exercises. These requirements are somewhat complex, are not compatible with the exercise frequencies used by FEMA (every two year for plume exposure pathway exercises and every six years for ingestion pathway exercises), and may be burdensome to States such as Illinois which is within the plume exposure pathway for 7 sites. NRC's requirements for exercise frequencies and participation could be simplified to be consistent with FEMA's requirements and to reduce the burden on offsite emergency response organizations without increasing risk to the public health and safety. Reconsideration of the provisions contained in Section IV.F.3 is needed.

10) Section IV.D.3 of Appendix E to 10 CFR Part 50, requires, inter alia, that "...The design objective of the prompt notification system shall be to have the capability to essentially complete that initial notification of the public within the plume exposure pathway EPZ in about 15 minutes..." This provision is ambiguous (e.g., it does not indicate when the 15 minutes begins to run). It has become a rigid standard (i.e., notification of the public via the emergency broadcast system (EBS) should commence within 15.0 minutes of a decision by cognizant offsite officials) that is generally required to be demonstrated at each offsite exercise. The Seabrook Appeals Board decision in ALAB 935⁵ indicated that the "about 15 minute requirement in Appendix E was intended only to encompass completion of the signal that notifies the public that a radiological emergency exists so that they should take appropriate action to seek additional information (e.g., by tuning to a prescribed emergency broadcast station)." The Appeal Board's decision was based on an examination of the Commission's original intent. The regulations should be modified to clarify what is meant by "about 15 minutes" and to codify the Seabrook Appeals Board criterion.

11) Section IV of Appendix E to 10 CFR Part 50 requires that the applicant for a nuclear power reactor operating license "provide an analysis of the time required to evacuate and for taking other protective actions for various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations." This analysis, which is to be included in an emergency plan, has come to be known as evacuation time estimates (ETEs). ETEs are intended to be used to identify potential bottlenecks during the planning process so that effective traffic controls can be included in the plans. However, intervenors in licensing

proceedings have interpreted the requirement to provide ETEs in emergency plans as a requirement to meet some predetermined evacuation times. Section IV of Appendix E should be revised to reflect the intended use of evacuation time estimates.

12) In 1990, the NRC had applications from three licensees requesting approval of emergency plans with reduced scope based upon the reduced risk and consequences of accidents involving spent fuel stored at the site after having been out of reactor vessel for some time. These requests for approval of so-called "defueled emergency plans" are required to be processed as requests for exemption from the requirements of the 16 planning standards of 10 CFR 50.47(b). Including provisions for defueled emergency plans in the rules would standardize and simplify the process.

Sections 50.47, 50.54 and Appendix E contain certain dates and deadlines that have long since passed, and, therefore, are no longer relevant and should be deleted. Also, paragraph A5 of Section IV in Appendix E has an error in grammar that should be corrected. Deletion of these dates and deadlines, and the grammatical correction are not substantive changes to the regulations that could have consequences and will not be discussed further in this regulatory analysis.

1.2 New Source Term Information

The NRC staff believes that one provision of the regulations should be reconsidered in view of new source term information. This is:

13) Insights gained from new source term information⁶ are contained in current Federal

guidance which is designed to give NRC personnel the best understanding of response planning for a serious reactor accident. These insights, referred to as the "staged notification capability" principle are summarized in the form of three conclusions and could be used to supplement protective action strategies found in Appendix 1 of NUREG-0654. Consideration should be given to revising Section IV.D of Appendix E of 10 CFR Part 50 to inform State and local government that they may use the staged notification capability principle in offsite radiological emergency response plans and preparedness.

2. OBJECTIVES

It has been nearly ten years since NRC promulgated regulations concerned with radiological emergency preparedness in 10 CFR Part 50 and its Appendix E. As is discussed in Section 1, experience with these regulations has shown that certain provisions lack clarity and/or do not reflect the original intent of the Commission. Also, additional source term information acquired since 1980 permit revising other provisions.

One objective of the proposed rulemaking is to revise the regulations concerning radiological emergency preparedness so that their meaning is clearer and better reflects the Commission's intent. Another objective is to revise the regulations so that they incorporate insights gained from new source term information. These revisions should be in accordance with the goals of 10 CFR 52, namely, to resolve issues prior to start of construction of nuclear power plants.

3. ALTERNATIVES

The following are the alternatives considered in this regulatory analysis.

3.1 No Change

This alternative would continue the status quo by making no change in the current regulations governing radiological emergency preparedness in the vicinity of nuclear power plants.

3.2 Revise the Regulations

This alternative would be to make substantive revisions in the regulations in 10 CFR Part 50 and its Appendix E in thirteen distinct areas. The proposed revisions are:

Reasonable Assurance

10 CFR 50.47(a)(1) requires that NRC makes a finding that "there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency" before an operating license for a nuclear power reactor can be issued. 10 CFR 50.47(b) lists 16 standards that offsite emergency response plans must meet. This proposed revision would forge the link between the two subsections by revising 10 CFR 50.47(b) to provide that meeting the 16 planning standards of 10 CFR 50.47(b) satisfies the "reasonable assurance" standard of 10 CFR 50.47(a)(1).

Definition and Use of Fundamental Flaws

This proposed revision would revise 10 CFR 50.47(a)(2) to adopt the following definition of fundamental flaw, "a failure of an essential element of the plan which would require the plan to be significantly revised." This definition is essentially that developed by the Appeals Board reported in ALAB-903. A plan with a fundamental flaw would not provide the "reasonable assurance" required by 10 CFR 50.47(a)(1). The proposed revision would use this definition as follows:

1. In 10 CFR 50.54(s)(2)(ii), the condition that could trigger a reactor being shutdown or another enforcement action being taken would be whether a fundamental flaw is corrected within 4 months of a finding.

2. In Section IV.F.5 of Appendix E to 10 CFR Part 50, the condition that would trigger a remedial exercise if an emergency plan is not satisfactorily exercised during a biennial exercise would be that NRC, in consultation with FEMA, finds fundamental flaws in such plans and preparedness.

Range of Protective Actions

The proposed revision would clarify the meaning of the phrase "range of protective actions" by adding to 10 CFR 50.47(b)(10) " different protective actions may be provided for various segments of the EPZ's population depending on their location in the EPZ, accident projections

and existing weather and road conditions. No particular protective action is necessarily appropriate for every accident."

Use of NUREG-0654

This proposed revision would add a footnote to 10 CFR 50.47(b) stating that NUREG-0654 contains "evaluation criteria" which are used as an aid by FEMA and NRC staff in evaluating emergency plans, and are not requirements.

Monitoring of Evacuees

This proposed revision would adopt FEMA's 20% planning basis and would add a paragraph 10 to Section IV.E of Appendix E to 10 CFR Part 50 requiring that emergency facilities have a capability to monitor 20% of the population in the plume exposure EPZ within 12 hours of arrival. In Section 4.5, the consequences of requiring a greater monitoring capability are discussed briefly.

Recovery and Reentry

This proposed revision would resolve the inconsistency between 10 CFR 50.47(b)(13), which requires that general plans for recovery and reentry be developed, and Section IV.H of Appendix E of 10 CFR Part 50, which requires only that criteria be described, by revising 10 CFR 50.47(b)(13) to read "Criteria are provided to determine under what conditions, following an accident, reentry of the facility and evacuated offsite area would be appropriate". Section IV.H of Appendix E would be modified to repeat this language. In Section 4.5, the consequences of

requiring general plans for recovery and reentry are discussed briefly.

Size of the EPZ

The proposed revision would codify the finding in CLI-89-12 by providing in 10 CFR 50.47(c)(2), 50.54(s)(1), and Section I of Appendix E that "Adjustments to the exact size of the EPZ should be made only on the basis of such straight forward administrative considerations as avoiding EPZ boundaries that run through the middle of schools or hospitals, or that arbitrarily carve out small portions of governmental jurisdictions."

Reference to Part 70 Licensees in Part 50

To preclude conflicts with 10 CFR Part 70, this proposed revision would delete all references to "fuel facilities" and Part 70 licensees from 10 CFR Part 50.

Exercise Frequency

This proposed revision would simplify the provisions currently in Section IV.F.3 of Appendix E to 10 CFR Part 50 which govern State and local government participation in offsite radiological preparedness exercises. The period for a State exercising its plans and preparedness related to ingestion exposure pathway measures would be increased from once every 5 years to once every 6 years, which is consistent with such radiological emergency preparedness exercises being held on a biennial basis. Also, when an offsite authority has a role under more than one radiological response plan, it would be required to fully participate in only one exercise every two years and only partially participate in other offsite plan exercises in such period.

Prompt Notification Capability

Section IV.D.3 to Appendix E of 10 CFR Part 50 currently provides, among other things, that "the design objective of the prompt public notification system shall be to have the capability to essentially complete the initial notification of the public within the plume exposure pathway EPZ within about 15 minutes." This proposed revision would clarify this provision by adding after "about 15 minutes", the following "After a decision is made by offsite officials that the public should be notified. The public should then take appropriate action to seek additional information (e.g., by tuning to a prescribed emergency broadcast station."

Evacuation Time Estimates

This proposed revision would clarify the intended use of evacuation time estimate analyses that are included in emergency response plans by adding the following sentence to Section IV of Appendix E of 10 CFR Part 50, "The analyses are to be used to facilitate planning for traffic control and to aid in determining protective actions for various portions of the EPZ population considering the location of the population, accident projections and potential road and weather conditions.

Emergency Plans for Defueled Nuclear Reactors

This proposed revision would add a new subsection (e) to 10 CFR 50.47 addressing the requirements for the reduced scope of emergency planning and preparedness for a defueled nuclear power plant, which is defined as a nuclear power plant which has been shut down whose

fuel has been subsequently been relocated to a storage pool for no less than 180 days for low density storage, and 700 days for high density storage. Review of the applicant's emergency plans would include the following standards with offsite aspects: (1) arrangements for requesting and effectively using offsite assistance onsite have been made; (2) procedures have been established for licensee communications with State and local response organizations, including periodic provision of plant and response status reports; (3) provisions exist for prompt communications among principal response organizations to offsite emergency personnel who would be responding onsite; (4) adequate emergency facilities and equipment to support the emergency response onsite are provided and maintained; (5) adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use onsite; (6) arrangements are made for medical services for contaminated and injured onsite individuals; (7) radiological emergency response training has been made available to those offsite who may be called to assist in an emergency onsite - the training shall be conducted at least annually; and (8) the plume exposure pathway EPZ shall be the site boundary - there will be no ingestion exposure pathway EPZ.

Staged Notification Capability

This proposed revision would revise Section IV.D to Appendix E of 10 CFR Part 50 to inform State and local governments that they may use the staged protective action strategies outlined in current Federal guidance. The staged protective action strategies outlined in this document augment the protective action strategies contained in Appendix 1 of NUREG-0654 with 3 conclusions based on new source term information.

4. CONSEQUENCES

The estimates of costs and benefits of the proposed revisions are based on guidance found in NUREG/BR-0058⁷, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission ("Guidelines") and NUREG/CR-3568⁸, "A Handbook for Value-Impact Analysis" ("Handbook"). The convention used in regulatory analyses is that costs and benefits are measured in terms of changes from the status quo. Several of the proposed revisions would not require changes in existing radiological emergency plans and preparedness. These proposed revisions would not change the status quo in the sense that they would not require changes in the content of plans and would not require changes in the conduct and evaluation of biennial exercises. They would, however, clarify NRC's regulations and improve the efficiency of the process for licensing nuclear power reactors.

The remainder of this section discusses costs and benefits associated with each of the thirteen substantive proposed revisions, revision by revision. However, the proposed revisions would occur in one unified rulemaking. Therefore, NRC's costs associated with the rulemaking (publishing notices of rulemaking, holding public meetings, responding to public comments, and issuing a final rule) will be discussed here. The proposed revisions would be of interest to nuclear power plant licensees and license applicants, State and local governments involved in radiological emergency response planning and preparedness, and persons and organizations who might intervene in licensing proceedings. Some of the proposed revisions might be considered controversial so that there may be many public comments. It is estimated, therefore, that 2 NRC professional staff years of effort would be required to complete the rulemaking. Based on

Abstract 5.2 (revision 1) from Generic Cost Estimates⁹, the estimated cost of one NRC professional staff person is \$72,000/staff-yr. The cost of NRC's staff effort associated with the rulemaking would then be approximately \$144,000.

The notice of proposed rulemaking (NPRM) and the final rule would be published in the Federal Register. It is estimated that publication of the NPRM and the final rule would each require 20 pages. From Abstract 5.1 of Generic Cost Estimates, the cost of publishing a page in the Federal Register is \$600, so that publication costs would be about \$24,000. The NRC costs associated with the rulemaking are then estimated to be approximately \$168,000. In

44 CFR Part 350, "Review and Approval of State and Local Radiological Emergency Plans and Preparedness", FEMA has promulgated radiological emergency preparedness regulations that are that agency's counterpart to NRC's emergency preparedness regulations. 44 CFR 350.5 contains criteria for review and approval of State and local radiological emergency plans and preparedness. This section discusses the use of the evaluation criteria contained in NUREG-0654 and repeats the 16 planning standards contained in 10 CFR 50.47(b). As the proposed revisions would amend several planning standards and clarify the use of the evaluation criteria, it would be expected that FEMA would have a rulemaking to amend 44 CFR 350.5 so that it would be consistent with the amended NRC regulations.

It is estimated that this rulemaking would require 0.5 FEMA professional staff years to complete. Assuming that the cost of one FEMA professional staff year is \$72,000, then the cost of staff effort for the FEMA rulemaking would be approximately \$36,000. The NPRM and the final rule

would be published in the Federal Register. It is estimated that publication of the NPRM and the final rule would each require 5 pages. Assuming that the cost of publishing a page in the Federal Register is \$600, the publication costs would be about \$6,000. The FEMA costs associated with the rulemaking are then estimated to be approximately \$42,000.

4.1 Reasonable Assurance

10 CFR 50.47(a) requires that NRC makes a finding that "there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency" before an operating license for a nuclear power reactor can be issued. 10 CFR 50.47(b) lists 16 standards that offsite emergency response plans must meet. Because the requirement for "reasonable assurance" and the requirement for 16 planning standards being met are in different subsections of 10 CFR 50.47, the argument has been made that they are separate requirements and that the "reasonable assurance" standard is higher and more rigorous than conformance with the 16 planning standards. The proposed revisions would modify 10 CFR 50.47(a) to clarify the intent of the Commission that the "reasonable assurance" standard is satisfied when the 16 planning standards are met.

This proposed revision would not affect offsite emergency plans and preparedness, nor would it change the criteria that are currently used to evaluate biennial emergency preparedness exercises. It would, however, clarify that the "reasonable assurance" standard and the 16 planning standards are linked. The only consequences of this proposed revision to 10 CFR 50.47 would be those benefits accruing from a more efficient licensing process.

4.2 Definition and Use of Fundamental Flaw

The proposed revisions would adopt the definition of fundamental flaw developed by the Atomic Safety and Licensing Appeal Board for the Shoreham Nuclear Power Station as reported in ALAB-903, namely, "an essential failing in any of the planning standards listed in 50.47(b) which can only be corrected through a significant revision to the emergency plan." The proposed revision would use this definition as follows:

1. In 10 CFR 50.54(s)(2)(ii), the condition that could trigger a reactor being shutdown or another enforcement action being taken would be whether a fundamental flaw is corrected within 4 months of a finding.
2. In Section F.4 of Appendix E to 10 CFR Part 50, the condition that would trigger a remedial exercise if an emergency plan is not satisfactorily exercised during a biennial exercise would be that NRC, in consultation with FEMA, finds fundamental flaws in such plans and preparedness.

It is the intent of the Commission that it be more difficult to find a fundamental flaw than to find a deficiency. The Board in ALAB-903 gives as an example of a deficiency that does not rise to the level of a fundamental flaw - a minor or isolated problem in an exercise such as a particular person's failure to follow the requirements of the emergency plan unless that person performs a critical role and there is no backup structure or provision that would mitigate the effects of the individual's failure.

This proposed revision would not effect offsite emergency plans nor would it change the criteria that are currently used to evaluate exercises, it would however, clarify the regulations by using fundamental flaws thus providing a more efficient licensing process.

4.3 Range of Protective Actions

10 CFR 50.47(b)(10), one of the 16 planning standards for offsite emergency response plans, requires that "a range of protective actions have been developed for the plume exposure pathway EPZ for emergency workers and the public" The intent of the term "range of protective actions" is to allow decisionmakers flexibility in deciding which are appropriate protective actions in view of circumstances. It allows these decisionmakers to consider: the mobility of special populations (e.g., nursing home residents); differences in the availability of physical facilities for sheltering; distance from the nuclear power plant; offsite conditions such as ice, snow, flooding, or earthquake damage; and accident conditions such as the composition and intensity of the radiological release, meteorology, and plume location. However, the provision allows an interpretation that every protective action (primarily sheltering and evacuation) must be available to each person in the EPZ at all times and intervenors in licensing proceedings have advocated for this later meaning.

The proposed revision would clarify the meaning of "range of protective actions" by adding to 10 CFR 50.47(b)(10) " different protective actions may be appropriate for various segments of the EPZ population depending on their location in the EPZ, accident projections and existing weather and road conditions. No particular type of protective action is necessarily appropriate

for every accident."

Offsite emergency response planners and protective action decisionmakers in biennial exercises have interpreted the planning standard embodied in 10 CFR 50.47(b)(10) in accordance with its intended meaning. Hence, the proposed revision would not require changes to offsite emergency response plans nor changes to the decisionmaking processes at biennial exercises. Therefore, it would have no consequences relative to the status quo other than the benefit of resolving an issue that has been raised in licensing proceedings.

4.4 Use of NUREG-0654

44 CFR 350.5(a) provides that the evaluation criteria contained in NUREG-0654 along with the 16 planning standards "are to be used by FEMA and the NRC in reviewing and evaluating State and local government radiological emergency plans and preparedness." FEMA's response to a comment that the evaluation criteria be optional was that the evaluation criteria (along with the 16 planning standards) should remain operative as the basis for reviewing, evaluating and approving State and local emergency plans and preparedness (see 48 FR 44334). The current practice is that State and local governments, and their consultants, use the evaluation criteria as the basis for developing emergency plans, and FEMA and NRC use them as the basis for reviewing, evaluating, and approving emergency plans and preparedness. For example, specific evaluation criteria are cited when problems with plans and biennial exercises are identified. This proposed revision would add a footnote to 10 CFR 50.47(b) stating that NUREG-0654 contains "evaluation criteria" which are used as an aid by FEMA and NRC staff in evaluating emergency

plans, and are not requirements.

This proposed revision would make the evaluation criteria contained in NUREG-0654 from a basis to an aid in the evaluation of emergency plans and preparedness. Emergency planners, and FEMA and NRC evaluators have years of experience in using the evaluation criteria in developing and in evaluating emergency plans, respectively. The 16 planning standards are general requirements and the evaluation criteria provide details on what is required. To develop or evaluate emergency plans without using the evaluation criteria would create uncertainty. In most cases, it is extremely unlikely that an emergency planner would develop a plan without attempting to meet all the evaluation criteria or that NRC and FEMA staff would not keep the evaluation criteria in mind when evaluating emergency plans and preparedness. Thus, the proposed revision would not be expected to have any impact other than to codify status quo. Rather, if there were problems in emergency plans or in emergency preparedness exercises, planning standards, not evaluation criteria, that were not satisfied would be cited in plan reviews or post exercise assessments.

Effect on FEMA

It would be expected that codifying the status quo of the importance of the evaluation criteria in NUREG-0654 may require FEMA to develop new guidance material on the use of evaluation criterion, although such guidance could be contained in amendments to 44 CFR 350.5, discussed earlier. Assuming that such guidance material would require approximately 2 months of effort (320 hours) to draft the modification and to complete the review process and that the \$70/hour

cost applies to the officials involved, the cost to FEMA of developing this guidance would be approximately \$22,000.

4.5 Monitoring of Evacuees

NURUG-0654 provides guidance for the preparation and evaluation of radiological emergency plans and for evaluation of biennial exercises. Evaluation criterion J.12 in NUREG-0654 provides that the personnel and equipment available at reception centers should be capable of monitoring within about a 12 hour period all residents and transients in the plume exposure EPZ arriving at these reception centers. In a memorandum providing interpretative guidance on evaluation criterion J.12, FEMA adopted a 20% planning basis (i.e., that reception centers have the capability to monitor 20% of the plume exposure EPZ population within 12 hours of arrival). Most recently, Licensing Boards for Seabrook (LBP 88-32) and Shoreham (LBP 88-13) accepted this value. However, the 20% planning basis was criticized by the Atomic Safety and Licensing Appeal Board in the course of Shoreham litigation in ALAB-905 as not being supported by evidence in the record and the issue was remanded. Licensing Board action on this matter was pending when, on March 3, 1989, all licensing proceedings for Shoreham were terminated by the Commission. However, because of conflict between the plain language of evaluation criterion J.12 in NUREG-0654 and the 20% planning basis, the issue can be expected to arise again.

The proposed revisions would adopt the 20% planning basis, which is considered to be reasonable, and would modify 10 CFR 50.47(b)(10) to reflect that a capability to monitor 20% of the population in the plume exposure EPZ within 12 hours of arrival at reception centers is

acceptable. It appears that the 20% planning basis is the status quo regarding monitoring of evacuees. It is used to determine whether there are sufficient monitoring resources (e.g., reception center facility capacity, numbers of survey meters and of monitoring personnel) in the review of plans and in the evaluation of exercises. Therefore, this proposed revision would have no consequences relative to the status quo other than the benefits flowing from foreclosing the raising of this issue in the future.

An alternative revision could be to adopt a stricter planning basis (e.g., the 100% planning basis indicated in NUREG-0654). As there has not been a severe accident at a commercial nuclear power plant since emergency preparedness regulations have been in effect, there is no experience concerning the percentage of the EPZ population who would go to reception centers, for monitoring after a radiological emergency. Therefore, there is no basis for estimating whether, a stricter planning basis would enhance public health. However, if such an accident should occur and if more than 20% of the EPZ population arrived at reception centers it would take longer to monitor evacuees and some of those contaminated would receive greater radiological exposure than if there were greater monitoring capabilities because there would be a longer time before they were decontaminated. There would be costs associated with requiring greater monitoring capabilities that could be significant. Plans would have to be revised; greater monitoring (and decontamination) resources in personnel and equipment would be needed, and even larger or additional reception centers could be necessary.

4.6 Recovery and Reentry

10 CFR 50.47(b)(13), one of the 16 planning standards for offsite emergency response plans, requires that "general plans for recovery and reentry are developed." Section IV of Appendix E to 10 CFR Part 50, "Content of Emergency Plans" discusses what must be contained in offsite emergency response plans to be compliance with the planning standards of 10 CFR 50.47(b). With respect to recovery and reentry, Section IV.H states only "Criteria to be used to determine when, following an accident, reentry of the facility would be appropriate or when operation could be resumed shall be described." Thus, there appears to an inconsistency between 10 CFR 50.47(b), which requires that general plans for recovery and reentry be developed and Appendix E, which requires that only criteria be described.

In contrast to the sections of offsite emergency response plans that address the other planning standards and are quite detailed, the sections that address recovery and reentry are usually tersely written and generally contain criteria rather than general plans. Intervenors in licensing proceedings have raised the issue that plans, therefore, do not comply with 10 CFR 50.47(b)(13), although they may satisfy Section IV.H of Appendix E. The proposed revision would resolve the inconsistency in the regulations regarding the recovery and reentry planning standard by revising 10 CFR 50.47(b)(13) to read "Criteria are provided to determine under what conditions, following an accident, reentry of the facility and evacuated offsite area are appropriate" and Section IV.H of Appendix E would repeat this language.

As most existing offsite emergency response plans are consistent with the proposed revision of the planning standard for recovery and reentry, the proposed revision would have no consequences other than the benefit of resolving the inconsistency in NRC's regulations.

An alternative to the proposed revision would be to keep the current 10 CFR 50.47(b)(13) and to change Section IV.H of Appendix E to be consistent with it. This alternative would require state and local governments to revise their offsite emergency response plans regarding recovery and reentry. There are approximately 70 sites with licensed nuclear power plants and at each site both State and local plans would have to be modified. Assuming that on the average 3 plans (1 State and 2 local) would have to be modified, and that it would require one person-month of effort to modify each plan, then this alternative would require approximately 210 person-months of effort to modify plans. Assuming that the cost of a person-month of effort, which would likely be that of consultants, is \$12,000, then the cost of revising plans would be approximately \$2,500,000. Regional offices of FEMA would review these revisions. Assuming that it would require 8 hours on the average to review each modified plan and that the cost of the effort of FEMA's regional professional staff is \$70/hr, then the cost of FEMA's reviews, which would be charged to the licensee, would be approximately \$120,000.

Recovery and reentry would occur days or weeks later than the initial emergency response and at a time when the initial response capabilities would be augmented by outside resources, including Federal resources. NRC believes, based on the experience of the TMI accident and the Full Field Exercise at Zion, recovery and reentry would be conducted with both substantial

support and considerable federal oversight so that elaborate general State and local plans would not be necessary.

4.7 Size of the EPZ

The exact size and configuration of the plume exposure EPZ (sometimes referred to as the "10-mile EPZ") has been questioned many times by licensees, State and local governments, and petitioners for rulemaking. In a proceeding associated with Shoreham (CLI-89-12), these questions were answered. There could be adjustments to the exact size of the plume exposure EPZ only on the basis of such straightforward administrative considerations as avoiding EPZ boundaries that run through the middle of schools or hospitals, or that arbitrarily carve out small portions of governmental jurisdictions. The proposed amendments would codify this answer.

Boundaries of EPZs are infrequently, if ever, perfect circles centered on the nuclear power plant, although the boundaries over lakes or oceans are circular. The boundaries over land follow jurisdictional boundaries, river banks, and roads. EPZs are broken up into emergency response planning areas (ERPAs), and, again, the boundaries of ERPAs are jurisdictional boundaries, rivers, and roads. A boundary of some ERPAs are by geometric necessity part of the EPZ boundary. For those sites where the size and configuration of the EPZ is adjusted to account for jurisdictional boundaries this amendment would have no consequences. For a site where the EPZ is bounded wholly, or partly, by rivers or roads that are not jurisdictional boundaries, the question arises whether such boundaries conform to the "straightforward administrative considerations" criterion.

Upon consideration of emergency response procedures, it should be clear that they do. The following example illustrates why. Emergency response plans call for the population of the EPZ to take protective actions, or no action, on the basis of ERPA in the event of a severe radiological emergency in which a release is imminent. In the EBS messages, the ERPAs affected by the protective action recommendations are identified by number and their boundaries. Boundaries that are described in terms of familiar landmarks such as roads and rivers are more readily understood than boundaries described in terms of school district boundaries. If ERPA boundaries, some of which are part of the EPZ boundary, are misunderstood, then some persons who should take protective action might not. Therefore, it can be concluded that from "straightforward administrative considerations" that roads and rivers are appropriate EPZ boundaries, in that the use of easily understood boundaries that help persons in the EPZ respond correctly to EBS protective action messages would be a "straightforward administrative consideration." Hence, this proposed revision would not be expected to affect existing emergency response plans, and would have no consequences other than the benefit of foreclosing the raising of an issue about the size and configuration of EPZs.

4.8 Deletion of References to Fuel Facilities in Part 50

Currently, 10 CRF 50.54(q) requires that a licensee authorized to operate a fuel facility maintain an emergency plan that meets the requirements of Appendix E of Part 50. In turn, the introduction to Appendix E states that the degree of compliance with the requirements of the appendix that is necessary for Part 70 licensees (i.e., fuel facilities) will be determined on a case-by-case basis. To assess the consequences of deleting references to fuel facilities and Part 70

licensees in Part 50, it is necessary to consider the content of Part 70, "Domestic Licensing of Special Nuclear Material".

Part 70 contains regulations that establish procedures and criteria for the issuance of licenses to receive title to, own, acquire, deliver, receive, possess, use, and initially transfer special nuclear material. It also establishes and provides for the terms and conditions upon which such licenses will be issued. "Special nuclear material" is defined in 10 CFR 70.4(m) to mean, in part, plutonium, uranium-233, and uranium enriched in the isotope 233 or in the isotope 235. 10 CFR 70.22(i) provides that an application for a license to possess and use special nuclear material for processing, scrap recovery, or conversion of uranium hexafluoride must contain plans for coping with emergencies. Furthermore, footnote 3 in 10 CFR 70.22(i) provides that such an emergency plan shall contain the elements that are listed in Section IV of Appendix E to Part 50. Approval of an application for a Part 70 license is inherently done on a case-by-case basis.

Thus, deletion of references to fuel facilities and Part 70 licensees in Part 50 would not result in any substantive changes in the licensing requirements for the facilities covered by 10 CFR 70.22(i), which are the types of facilities subject to Part 70 from which there are the greatest risks of offsite radiological releases. Neither Part 50 nor Part 70 defines a "fuel facility" so that the use of that term in Part 50 introduces an ambiguity. Also, not all facilities that require a licensee under Part 70 are subject to 10 CFR 70.22(i). Therefore the reference to Part 70 licensees in Part 50 creates an ambiguity as to whether the reference is to all Part 70 licensees or only to 10 CFR 70.22(i) licensees. An interpretation that the reference covers all Part 70

licensees would bring Part 50 into conflict with Part 70 because Part 70 requires emergency plans only of the licensees subject to 10 CFR 70.22(i).

Deletion of reference to fuel facilities and Part 70 licensees in Part 50 would have no consequences other than the beneficial, unquantifiable consequence of eliminating ambiguities and a possible conflict with Part 70 regarding licensing of special nuclear materials facilities not subject to 10 CFR 70.22(i). As it is not the intent of this rulemaking to modify the requirements for licensing of special nuclear material facilities, no alternative to the proposed revision other than no action need be considered for this matter.

4.9 Exercise Frequency

Section IV.F.3 of Appendix E to 10 CFR Part 50 contains the requirements imposed on State and local governments for participation in offsite radiological emergency preparedness exercises. These requirements are somewhat complex, are not compatible with the exercise frequencies used by FEMA, and may be burdensome to States such as Illinois which is within the plume exposure pathway for 7 sites. For example, FEMA requires an ingestion exposure pathway exercise at each site at least once every six years; however, Section IV.F.3.e gives a five-year frequency for ingestion exposure pathway exercises. Once every 30 years, this provision would require one extra ingestion pathway exercise compared with FEMA's requirements. The cost of ingestion pathway exercises would probably be less if held in conjunction with plume exposure pathway exercises (held biennially) rather than being held separately. If ingestion exposure pathway exercises are held every five years, every other ingestion exposure pathway exercise would be

out of sequence with the plume exposure pathway exercise. Another example of incompatible frequencies is Section IV.F.3.c, which requires that at least every 7 years, all States within the plume exposure EPZ for a given site must fully participate in a offsite exercise for that site.

This proposed revision would simplify the provisions currently in Section IV.F.3 of Appendix E to 10 CFR Part 50, which govern State and local government participation in offsite radiological preparedness exercises. The period for a State exercising its plans and preparedness related to ingestion exposure pathway measures would be increased from once every 5 years to once every 6 years, which is consistent with such radiological emergency preparedness exercises being held on a biennial basis. Also, when an offsite authority has a role under more than one radiological response plan, it would be required to fully participate in only one exercise every two years and only partially participate in other offsite plan exercises in such period.

One consequence of the proposed revision is that inconsistencies in exercise frequencies between Section IV.F.3 and FEMA's requirements would be eliminated. Another consequence is that certain State and local governments could potentially fully participate in fewer exercises per year. It would not be expected that the proposed revision would have any adverse impact on the public health and safety.

Impact on States

Demonstration of the ability to protect the public health and safety in ingestion exposure pathway exercises is a responsibility of the States within the 50-mile ingestion pathway EPZ. Because of the relatively large size of the ingestion pathway EPZ, more than one State is involved in ingestion exposure pathway exercises at most of the approximately 70 reactor sites. The proposed revision would reduce the number of ingestion pathway exercises by one every 30 years for each reactor site, or about 2 per year overall.

An ingestion pathway exercise requires partial activation of the State emergency operations center (EOC) and some demonstration of the ability to monitor the ingestion pathways for radiological contamination in accordance with FEMA guidance^{12,13}. Such exercises usually extend over 2 days and usually involve personnel from a State's emergency management agency and health agency. It would minimally involve 8 State staff persons (2 for command and control, 2 for accident assessment, and 4 for field monitoring). Assuming that each of these persons would spend 2 workdays on the exercise (16 hours) and there is 24 hours of planning effort, then there would be 152 hours of State staff effort spent on the exercise for each State involved. If there are two States involved in an exercise and 2 exercises per year are avoided, then approximately 600 hours per year of State personnel effort would be avoided. If the cost of this effort is \$40/hr, then approximately \$24,000 per year in State effort would be minimally avoided by the change in the frequency of ingestion pathway exercises.

Industry Operations

It will be assumed that FEMA staff and consultants would be involved in planning, observing, and evaluating ingestion pathway exercises. In each State, there would likely be at least 4 observers (2 at the State EOC, and one with each of 2 field monitoring teams). With two States involved and the exercise extending for 2 workdays, then the FEMA effort to observe the exercise would be 128 hours. There would also be FEMA effort for planning the exercise and writing the post exercise assessment of about 32 hours. The total FEMA effort per exercise would be about 160 hours. The cost of this FEMA effort at \$70/hr would be approximately \$11,000 per exercise. There would also be travel expenses of about \$4,000 (8 observers at \$500/observer) per exercise. These expenses would be charged to the licensee. The annual cost savings to the licensees if 2 ingestion pathways exercises per year would be avoided would be approximately \$30,000.

4.10 Prompt Notification Capability

Section IV.D.3 to Appendix E of 10 CFR Part 50 currently provides, among other things, that "the design objective of the prompt public notification system shall be to have the capability to essentially complete that initial notification of the public with the plume exposure pathway EPZ within about 15 minutes." Offsite radiological emergency preparedness (REP) plans include prompt public notification systems with different components for notifying different segments of the public. These plans call for notifying most of the population by activating sirens to alert persons to tune to an Emergency Broadcast System (EBS) radio station and broadcasting the emergency message over the EBS station within a few minutes of the activation of the sirens.

Other means could be used to notify special population groups. For example, a deaf individual could be notified over a teletypewriter (TTY) or by dispatching a vehicle to that individual's residence. The above provision has come to be interpreted to mean that when evaluating biennial REP exercises, that within 15 minutes of a decision by the cognizant offsite officials to broadcast a message over EBS, the broadcast of that message over EBS (after activation of sirens) should commence. In effect, this interpretation treats the word "about" as surplusage.

The Seabrook Appeals Board decision in ALAB 935 indicated that the "about 15 minute" requirement in Appendix E was intended only to encompass completion of the signal (i.e., activating sirens) that notifies the public that a radiological emergency exists so that they should take appropriate action to seek additional information (e.g., by tuning to a prescribed emergency broadcast station). The proposed revision would codify the decision in ALAB 935.

4.11 Use of Evacuation Time Estimates

Section IV of Appendix E to 10 CFR Part 50 requires that the applicant for a nuclear power reactor operating license "provide an analysis of the time required to evacuate and for taking other protective actions for various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations." This analysis, which is to be included in an emergency plan, has come to be known as evacuation time estimates (ETEs). ETEs are intended to be used to identify potential bottlenecks during the planning process so that effective traffic controls can be included in the plans. They are also intended to be used by decisionmakers during an actual emergency to in considering road conditions, time of day and seasonal variations in population.

However, intervenors in licensing proceedings have interpreted the requirement to provide ETEs in emergency plans as a requirement to meet some predetermined evacuation times. The proposed revisions would modify Section IV of Appendix E of 10 CFR Part 50 by stating that "these analyses are to be used to facilitate planning for traffic controls and to aid in determining protective actions for various portions of the EPZ population considering the location of the population, accident projections and potential road and weather conditions."

In 1980, NRC and FEMA jointly published NUREG-0654. Since its publication, NUREG-0654 has been used by State and local governments and by nuclear facility operators in the development of radiological emergency response plans and preparedness and by NRC, FEMA, and other Federal agencies in reviewing State, local, and licensee plans and preparedness. Thus, ETEs have been used for their intended purposes and in accordance with the proposed revision. Hence, this proposed revision would not change how ETEs have been used in the development and review of emergency response plans and preparedness, and in biennial exercises. The only consequence of this proposed revision would be, therefore, the benefit of reducing the likelihood that issues concerning ETEs are raised in licensing proceedings.

4.12 Emergency Plans for Defueled Nuclear Reactors

In 1990, the NRC had applications from three licensees requesting approval of emergency plans with reduced scope based upon the reduced risk and consequences of accidents involving spent fuel stored at the site after having been out of reactor vessel for some time. These request for approval of so-called "defueled emergency plans" are required to be processed as request for for

exemption from the requirements of the 16 planning standards of 10 CFR 50.47(b).

This proposed revision would add a new subsection (e) to 10 CFR 50.47 addressing the requirements for the reduced scope of emergency planning and preparedness for a defueled nuclear power plant, which is defined as a nuclear power plant which has been shut down whose fuel has been subsequently been relocated to a storage pool for no less than 180 days for low density storage, and 700 days for high density storage. These times were found to be the minimum decay times to avoid fuel melting and cladding oxidation following a loss of water during storage in a study by Sandia Laboratories¹⁵.

This proposed revision would not be expected to change substantively the requirements for emergency plans for defueled nuclear reactors. In the absence of a rule, the Commission would be expected to impose these requirements in response to petitions for exemption from the 16 planning standards when the time thresholds for delay after shutdown have been met. The only consequence of this proposed revision would be the benefits flowing from standardizing and simplifying the process.

4.13 Staged Notification Capability

Section IV.D of Appendix E to 10 CFR Part 50 addresses the content of offsite emergency response plan regarding notification procedures. Section IV.D gives State and local officials the flexibility to activate the entire notification system simultaneously or in a graduated or staged manner. The proposed revision would add a sentence to Section IV.D to inform State and local governments that they may use the protective action capability strategies outlined in current

Federal guidance. This document was designed to give NRC personnel the best understanding of response planning for a serious reactor accident.

Research (NUREG-1150) continues to show that evacuations of two to three mile radius initiated before or shortly after the start of a release are most effective in reducing the risk of early health effects from a severe reactor accident. Evacuation of greater distance (10 miles) early in the accident could impede the evacuation of the population near the plant, who are at the greatest risk, and dilute the limited resources of offsite officials. Therefore, the concept of staged protective actions should be specifically provided for in the regulations.

5. DECISION RATIONALE

In this section, decision rationales for each of the thirteen proposed revisions to 10 CFR Part 50 and its Appendix E are discussed.

Reasonable Assurance

This proposed revision would clarify the Commission's intent that the "reasonable assurance" standard of 10 CFR 50.54(a) is satisfied when the 16 planning standards of 10 CFR 50.54(b) are met. It is a reasonable means to preclude spurious issues in licensing proceedings. It would not alter the criteria that are currently used to evaluate radiological emergency preparedness exercises.

Definition and Use of Fundamental Flaws

This proposed revision would revise 10 CFR 50.47(a)(2) to adopt the following definition of

fundamental flaw, "a failure of an essential element of the plan which would require the plan to be significantly revised." This definition is essentially that developed by the Appeals Board reported in ALAB-903. A plan with a fundamental flaw would not provide the "reasonable assurance" required by 10 CFR 50.47(a)(1). The proposed revision would use this definition as follows:

1. In 10 CFR 50.54(s)(2)(ii), the condition that could trigger a reactor being shutdown or another enforcement action being taken would be whether a fundamental flaw is corrected within 4 months of a finding.
2. In Section IV.F.5. of Appendix E to 10 CFR Part 50, the condition that would trigger a remedial exercise if an emergency plan is not satisfactorily exercised during a biennial exercise would be that NRC, in consultation with FEMA, finds fundamental flaws in such plans and preparedness. It is a reasonable regulatory action to preclude spurious issues in licensing proceedings that would not change offsite emergency response plans or preparedness.

Range of Protective Actions

This proposed revision would clarify in 10 CFR 50.47(b)(10) that different protective actions might be appropriate for various segment of the population of the EPZ for different types of accidents and that no particular type of protective action is universally appropriate. It is a reasonable means to preclude spurious issues in licensing proceedings that would not change offsite emergency response plans or preparedness.

Use of NUREG-0654

This proposed revision would clarify that the evaluation criteria in NUREG-0654 are to be used as an aid in evaluating emergency plans, and are not requirements. The evaluation criteria in NUREG-0654 provide excellent guidance on what should be included in emergency plans to meet the 16 planning standards of 10 CFR 50.47(b) that is used not only by NRC and FEMA evaluators but also by emergency planners in developing plans. Therefore, this proposed revision, if adopted, would not be expected to have significant impacts on the development and evaluation of most emergency plans, as the evaluation criteria would continue to be used. It would, however, have the benefit of eliminating the need to modify an emergency plan (and the associated costs) that does not technically an evaluation criterion but does satisfy all the planning standards. It is a reasonable regulatory action.

Monitoring of Evacuees

This proposed revision would codify FEMA's 20% planning basis (i.e., that reception center have the capability to monitor 20% of the plume exposure EPZ population within 12 hours of arrival), which appears to be the status quo regarding monitoring of evacuees and is considered to be reasonable. As there has not been a severe accident at a commercial nuclear power plant since emergency preparedness regulations have been in effect, there is no experience concerning the percentage of the EPZ population who would go to reception centers for monitoring after a radiological emergency. Therefore, there is no basis for estimating how much a stricter planning basis would reduce risk to the public health and safety from evacuees not being monitored

Reference to Part 70 Licensees in Part 50

Deletion of references to Part 70 licensees is a reasonable regulatory action that would eliminate inconsistencies between 10 CFR Part 50 and Part 70 and that would not alter the requirements of Part 70 that certain special nuclear material facilities have radiological emergency response plans and preparedness.

Exercise Frequency

The proposed revisions would simplify the exercise requirements for State and local governments currently in Section IV.F.3 of Appendix E of 10 CFR Part 50, which are complex, are not compatible with the exercise frequencies used by FEMA, and which may be burdensome. It would reduce the number of plume exposure pathway exercises in which certain State and local governments would need to fully participate and would reduce the number of ingestion exposure pathway exercises by one in thirty years for a reactor site. The savings from fewer ingestion pathway exercises could be approximately \$50,000 annually. This is a reasonable regulatory action that resolves differences between the practices of the two federal agencies with responsibility for radiological emergency preparedness and that could result in cost savings from the changes in the frequency of exercises.

Prompt Notification Capability

Currently in biennial exercises, the capability to notify the public within 15 minutes of a decision by cognizant offsite official with use of the prompt notification system must be demonstrated. By notifying the public is meant initiation of a message over the Emergency Broadcast System

would codify the Appeal Board's decision in ALAB-935 to allow 15 minutes for activating sirens to notify the public to seek additional information over EBS. The Appeal Board's decision was based on an examination of the Commission's original intent. As siren would be sounded about 3 minutes before initiation of EBS messages, the proposed revisions could result in a delay of up to 3 minutes in starting protective actions because notification of the public could begin 3 minutes later than under current practice.

Use of Evacuation Time Estimates

The proposed revisions would clarify the intended use of evacuation time estimates (ETEs), which are included in radiological emergency response plans, by modifying Section IV of Appendix E of 10 CFR Part 50 to explicitly state this intended use. ETEs are already used by protective action decision makers in the manner proposed in the rule change in biennial exercises. Hence, this would be a reasonable regulatory action whose the only consequence would be to improve the efficiency of the licensing process by precluding this issue from being raised.

Emergency Plans for Defueled Nuclear Reactors

This proposed revision would add a new 10 CFR 50.47(e) with requirements for emergency plans for defueled nuclear reactors. These requirements would otherwise be exposed to be imposed in response to petitions for exemptions from the 16 planning standards of 10 CFR 50.47(b). Therefore, this is a reasonable regulatory action that would standardize and simplify the process.

Staged Notification Capability

This proposed revision would modify Section IV.D to Appendix E of 10 CFR Part 50 to inform State and local governments that they may use the staged protective action strategies outlined current Federal guidance. The protective action strategies outlined in this document augment the protective action strategies contained in Appendix 1 of NUREG-0654 based on new source term information. This is a reasonable regulatory action to improve protective action strategies in radiological emergency response plans and preparedness.

6. IMPLEMENTATION

The proposed regulatory action would not be expected to present any significant implementation problems. None of the proposed revisions to 10 CFR Part 50 and its Appendix E would require changes to radiological emergency response plans and preparedness than would require time to implement; in fact, most of the proposed revisions would continue the status quo regarding plans and preparedness. However, the proposed revision regarding the definition and use of fundamental flaw might require FEMA to modify its guidance material, which might require several months. The proposed revisions regarding recovery and reentry and regarding the use of NUREG-0654 could induce a rulemaking by FEMA; however, implementation would not be expected to hinge on the conclusion of that rulemaking.

7. PAPERWORK REDUCTION ACT ANALYSIS

The NRC Guidelines require that a regulatory analysis address the requirements of the Paperwork Reduction Act (P.L. 96-511) when a proposed regulatory action may impose additional

information-collection requirements (applications, reporting, record keeping) that affect 10 or more persons. None of the proposed revisions to 10 CFR Part 50 and its Appendix E impose additional information-collection requirements. Therefore, the analysis required by the Paperwork Reduction Act does not apply to this rulemaking.

8. REGULATORY FLEXIBILITY ACT ANALYSIS

The NRC Guidelines require that a regulatory analysis address the requirements of the Paperwork Reduction Act (P.L. 96-534) when a proposed rule is likely to have a significant economic impact on a substantial of "small entities" (e.g., small business establishments, non-profit organizations, and small government jurisdictions). None of the proposed revisions to 10 CFR Part 50 and its Appendix E would impose additional economic burdens on small entities.

Therefore, the analysis required by the Regulatory Flexibility Act should not apply to this rulemaking.

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