



SECRETARY

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 11, 2000

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ADJUDICATED

Miss Joan Claybrooke, President
Public Citizen Litigation Group
1600 20th Street, NW.
Washington, DC 20009

DOCKET NUMBER
PETITION RULE PRM 140-1
(44FR50419)

Dear Miss Claybrooke:

I am responding to the petition for rulemaking (PRM-140-1) that was submitted to the Nuclear Regulatory Commission (NRC) on July 24, 1979, by the Public Citizen Litigation Group and the Critical Mass Energy Project, on behalf of certain residents of Middletown, Pennsylvania, who stated that they were harmed by the March 28, 1979, accident at the Three Mile Island, Unit 2 nuclear reactor (TMI-2). The petition requested that the NRC rule that the accident was an "extraordinary nuclear occurrence" (ENO) within the meaning of Part 140 of Title 10 of the *Code of Federal Regulations*. In addition, the petition requested that the NRC amend the criteria it uses for making an ENO determination "to bring them more in line with the clear intent of Congress with regard to this matter."

When this petition was received, the NRC was in the process of making a determination as to whether the accident at TMI-2 was an ENO. Therefore, the first request in the petition was handled as a public comment on NRC's announcement of its intent to make such a determination. In an April 23, 1980, *Federal Register* notice (45 FR 27590), the NRC published its finding that the March 28, 1979, accident at TMI-2 was not an ENO (Enclosure 1). Thus, the first request in the petition has been denied.

With respect to the second request in the petition, even though the NRC believed that the existing criteria for determining that an ENO has occurred were consistent with the Atomic Energy Act, of 1954, as amended, several other options were considered and published as a proposed rule (Enclosure 2) for public comment on April 9, 1985 (50 FR 13978). The NRC received 27 letters commenting on the proposed rule. There was no preponderance of support for any of the options proposed by the NRC. However, the arguments against changing the criteria for determining that an ENO has occurred were persuasive. The NRC now finds that the options in the 1985 proposed rule are deficient in that they do not meet the intent of Congress when it established the ENO concept. Thus, the Commission has denied the second request in the petition and withdrawn the proposed rule. For a more detailed discussion on the NRC's reasoning in this matter, please see the enclosed *Federal Register* notice (Enclosure 3) that both denies the petition and withdraws the proposed rule.

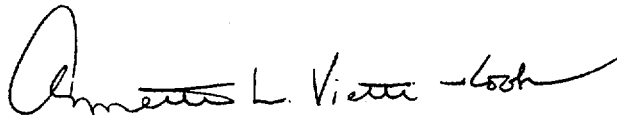
Several factors contributed to the delay in completing the resolution of this petition until this time. The Commission dealt with the central request of the petition (i.e., to declare the TMI-2 accident an ENO) in a timely fashion. The petition was received on July 25, 1979, and the NRC published its finding that the accident was not an ENO in the *Federal Register* on April 23, 1980. In announcing its finding, the Commission did not specifically deny the petition's request to declare the accident at TMI-2 an ENO.

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The other request of the petition, to modify the ENO determination criteria, was considered to be of secondary importance. The Commission decided to consider this proposal but accorded it a low priority because of resource considerations and the existence of higher priority rulemaking actions. In the meantime, in light of the public comments received, the Commission has reexamined its reasoning for the need for modification of the ENO criteria and the options that it proposed in the *Federal Register* notice for the proposed rule (50 FR 13978). The Commission also considered the legislative history of the Price-Anderson Act in arriving at its finding in this matter.

Sincerely,



Annette L. Vietti-Cook

Enclosures:

1. April 23, 1980, *Federal Register* Notice
2. April 9, 1985, *Federal Register* Notice
3. *Federal Register* Notice Denying the Petition
and Withdrawing the Proposed Rule

cc: James Riccio, Public Citizen
Critical Mass Energy Project

3. Copyright Clearance Center

In an attempt to establish a centralized mechanism to facilitate payment of royalty fees for copying activities not exempt under the Copyright Act, publishers, with planning assistance by authors and librarians, established the Copyright Clearance Center, Inc. The Center, which is a not-for-profit organization, does not provide copies or grant permission to copy. Each publisher sets its own article copying fees and, to the extent feasible, publishes an article-fee code on the first page of articles to inform users of the appropriate charges for copying.

Participating libraries register with the Center and obtain a user-registration number for use in reporting copying. They submit periodic reports of copying activities and pay the applicable royalty fees on the basis of their chosen payment method, including deposit accounts, billing, and possible prepayment through a stamping meter or stamp.

Presently, this clearance system operates with respect to work in journals, magazines, newsletters, proceedings, symposia, and similar works. Its operating costs are borne by participating publishers.

4. Specific questions

The Copyright Office is interested in receiving comments and testimony about any issues relevant to section 108 which concern copyright owners, librarians, and their patrons. Of particular interest are answers to the following questions:

1. To what extent has section 108 changed library procedures? Has there been any significant effect on users' and librarians' access to information?

2. To what extent has section 108 affected established patterns in the publishing industry and the relationship between authors, libraries, and library users?

3. Depending upon the type of library involved, described the effect, if any, of section 108 upon the type and amount of copying performed by the library on its own behalf or on behalf of users. To what extent have publishers and authors experienced a change in the number of requests from libraries to reproduce works since the present law went into effect?

4. In what manner has the establishment of the Copyright Clearance Center affected your experience under section 108? Would the creation of a National Periodical Center affect your operations? (The intent of these questions is to elicit responses from publishers and authors

on the one hand and libraries and library users on the other.)

5. Describe the impact, if any, that section 108 has had upon the replication of nonprint materials, including the ability of libraries to reproduce phonorecords and audio visual works dealing with news. In response to this question describe any problems which have been encountered as the result of the narrower exemptions for nonprint materials under section 108.

6. How has the CONTU "rule of five" worked in practice? How should periodicals more than five years old be treated?

7. What is your opinion of the relationship between section 107 ("fair use") and sections 108 ("reproduction by libraries and archives")?

8. How should foreign copyrighted works and requests from foreign libraries be treated under section 108 and, in practice, how are they treated now?

9. If problems do exist, can they be resolved without resort to legislative amendment? If so, what are the problems, and how could they best be resolved? If not, what changes should be made in the law?

(17 U.S.C. 108)

Dated: April 14, 1980.

Barbara Ringer,
Register of Copyrights

Approved:
Daniel J. Boorstin,
The Librarian of Congress.

(PR Doc. 80-12337 Filed 4-23-80; 8:43 am)

BILLING CODE 1410-01-M

NUCLEAR REGULATORY COMMISSION

(Dockets Nos. 50-237 and 50-249)

Commonwealth Edison Co.; Issuance of Amendment To Facility Operating License

The U.S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 42 to Facility Operating License No. DPR-25 issued to Commonwealth Edison Company, which revised the license and Technical Specifications for operation of the Dresden Nuclear Power Station, Unit No. 3, located in Grundy County, Illinois. The amendment is effective as of the date of issuance.

The amendment (1) authorizes changes to the Technical Specifications to support review of future reloads for Dresden Unit 3 under provisions of 50.59 and (2) modifies license condition 3.E to assure a conservative MCPR operating limit during coastdown operation.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of the amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of the amendment will not result in any significant environmental impact and that pursuant to 10 CFR Section 51.5(d)(4) an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of the amendment.

For further details with respect to this action, see (1) the application for amendment dated December 10, 1979 as supplemented February 6 and March 24, 1980, (2) Amendment No. 42 to License No. DPR-25 and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, NW., Washington, D.C., and at the Morris Public Library, 604 Liberty Street, Morris, Illinois. A copy of items (2) and (3) may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 16th day of April 1980.

For the Nuclear Regulatory Commission,
Vernon E. Rooney,
Acting Chief Operating Reactors Branch #3
Division of Operating Reactors.

(PR Doc. 80-12414 Filed 4-23-80; 8:43 am)
BILLING CODE 7890-01-M

In the Matter of Whether the Accident at the Three Mile Island Nuclear Station, Unit 2, on March 28, 1979, Constitutes an Extraordinary Nuclear Occurrence as Defined by Section 110(f) of the Atomic Energy Act and 10 CFR Part 140 of the Commission's Regulations**Determination**

The Commission today determines that the accident at Three Mile Island did not constitute an "extraordinary nuclear occurrence" (ENO) as that term is defined by the Price-Anderson Act and the Commission's regulations. Specifically, we find that Criterion I for an ENO, contained in 10 CFR 140.85, has

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ENCLOSURE 1

not been met. For reasons explained below, we make no explicit finding as to Criterion II.

In the event of a nuclear accident (or nuclear "incident" as the term is used in the Atomic Energy Act), claims for injuries or damages can be brought by any injured person against the plant licensee (in this case Metropolitan Edison Company) and any other party considered responsible for the accident. Congress has established a system of private insurance, funds from electric utilities and government indemnity totalling \$560 million to pay such claims. One of the principal obstacles to a claimant's recovery for injuries or damages could be the necessity of proving in a court proceeding that the defendants were negligent and that their negligence caused or contributed to the accident. However, when the Commission determines that a nuclear incident was an "extraordinary nuclear occurrence," the Price-Anderson Act provides for a system which is similar in some respects to a "no-fault" recovery scheme.

When the Commission determines that an ENO has occurred, persons with claims for injuries or damages need not prove that the licensee or other responsible parties were negligent. Furthermore, the defendants in legal proceedings cannot argue that the person making the claim somehow contributed to the injury. In addition, an ENO determination would extend the time within which a legal action could be commenced. Whether or not an ENO is declared, a claimant must still prove an injury or damage, the monetary amount of the loss and how the loss was caused by the accident. When, as here, an incident is not found to be an ENO, all court proceedings are conducted under applicable state and federal law.

We note at the outset that, in ordinary parlance, the accident at Three Mile Island was "extraordinary". It resulted in heavy damage to the reactor itself, caused evacuation of some persons from the surrounding area, and generated concern and anxiety throughout the country. In our decision today we do not in any respect intend to downplay the seriousness of this accident or its consequences.

However, the Price-Anderson Act sets down clear statutory responsibilities for the Commission to perform when such an event has occurred. The term "extraordinary nuclear occurrence" has a specific legal meaning which is quantified by Commission regulations that have been in effect since 1968. Our decision today is limited to the application of those regulations to the accident at Three Mile Island. It is only

in that sense that we find this accident not to be an "extraordinary nuclear occurrence".

We believe that the accident at Three Mile Island demonstrates that these regulations should be reexamined. Indeed, we have some reservations about the criteria and the statutory definition of an ENO in light of the Three Mile Island experience.¹ As we note below, a rulemaking is now under way which will examine the need to modify the current criteria and, if necessary, the statute itself.

I. Background

The events which transpired at the Three Mile Island Nuclear Station (TMI) on March 28, 1979, and the days to follow are by now well known to the public. It will not be our purpose here to review the accident itself, which has been described in detail in recent reports by the President's Commission on the Accident at Three Mile Island and by the NRC Special Inquiry Group. For present purposes it is sufficient to note that during the course of the accident, radioactive material was released into the environment at detectable levels offsite and some persons were advised by the Governor of Pennsylvania to evacuate a five-mile zone near the plant. These facts alone were sufficient to suggest an "extraordinary nuclear occurrence".

On July 2, 1979, the Commission received a paper from its staff which set out in detail the operation of the ENO provisions in the Price-Anderson Act and NRC regulations, and recommended that the Commission proceed to determine whether the accident at TMI constituted an ENO. The Commission accepted this recommendation, and announced on July 20, 1979, that it was initiating procedure² to make the determination. Public comment on this announcement was officially requested in the Federal Register notice published July 23, 1979, 44 FR 43128. Two days later, on July 25, a petition requesting an ENO determination was received from persons residing in the vicinity of TMI.

Pursuant to its regulations, the Commission ordered on August 17, 1979, that a staff panel be formed to review available data and to present findings to the Commission on whether the accident at TMI met the criteria for an ENO contained in 10 CFR Part 140. The Executive Director for Operations, chairman of the panel, reported back to the Commission on August 23 that the

panel had been formed and would begin work immediately. A week later, on August 30, the Executive Director reported to the Commission the procedures the staff panel would follow in analyzing data and reaching its recommendations. These procedures were published in the Federal Register on September 7, 1979, 44 FR 52391. The panel continued its work throughout the fall of 1979.

On August 29, 1979, the Commission received a request for a public hearing on the ENO determination from attorneys representing plaintiffs in class action suits alleging damages resulting from the accident. The Commission granted this request, and ordered the staff panel to conduct an informal hearing in Harrisburg, Pennsylvania, at which members of the public could address the panel and submit statements for the record. This hearing was announced in the Federal Register on November 6, 1979, 44 FR 64133, and efforts were made to inform the public in the Harrisburg area.

The hearing was held on November 21, 1979, before several members of the staff panel and members of the working group assisting the panel in the review of accident data. Seven persons addressed the panel, and statements were submitted for the record by several speakers and others unable to attend the hearing. A transcript of the hearing was kept as part of the ENO determination record.

On December 31, 1979, the staff panel submitted its report to the Commission. Announcement was made in the Federal Register on January 4, 1980, that the report was available for public comment for a thirty-day period. 45 FR 1180. This public comment period ended on February 4, 1980, thus closing the record for this determination.

II. Summary of the Record Before the Commission

The record in this proceeding is in four parts, all of which are available for public inspection in the NRC Public Document Room in Washington, D.C. and in Middletown, Pennsylvania: (1) Report of the Staff Panel, December 31, 1980, (2) Public comments following the announcement of the ENO determination, (3) Transcripts of the November 21 hearing in Harrisburg, and statements submitted for the record, and (4) Public comments on the Report of the Staff Panel.

A total of 58 public comments have been received which generally address the ENO question. These comments are summarized and broken down by category in Appendix C to the Report of the Staff Panel. The Staff Report also

¹ Commissioner Gilinsky believes that the criteria presently used to determine the occurrence of an ENO reflect an outdated and overly relaxed view of the level of acceptable radiation dosages.

responds to each category of comments. Four public comments were received by the Commission which specifically address the staff's report, of which one analyzes the staff's findings in some detail.

In reaching this determination, the Commission has considered all parts of the record. Although we accept the findings of the Staff Report and thus conclude that the accident was not an ENO, we do so having weighed carefully the contrary views expressed in public comments and at the Harrisburg hearing.

III. Statutory and Regulatory Framework

The term "extraordinary nuclear occurrence" is defined by Section 11(j) of the Atomic Energy Act as follows:

The term "extraordinary nuclear occurrence" means any event causing a discharge or dispersal of source, special nuclear, or byproduct material from its intended place of confinement in amounts offsite, or causing radiation levels offsite, which the Commission determines to be substantial, and which the Commission determines has resulted or probably will result in substantial damages to persons offsite or property offsite.

The definition thus provides a two-pronged test: (1) substantial offsite release or substantial offsite radiation, and (2) actual or likely substantial offsite damages. This section also requires the Commission to "establish criteria in writing" for application of these tests to specific events.

The Commission's criteria are found in 10 CFR 140.84 and 140.85, and are set out fully in the Staff Report at pp. 8-11. Appendix B to the Staff Report may be referred to for a more detailed description of the ENO and waivers of defenses provisions of the Price-Anderson Act and of the Commission's ENO criteria. It will suffice to note here that in making this determination we have applied Criterion I and Criterion II to the facts of the Three Mile Island accident. As described below we find that the radiological releases associated with the accident do not rise to the levels specified in Criterion I, and thus are not "substantial" for statutory purposes. We reach no explicit finding on whether damages resulting from the accident meet Criterion II, and hence make no determination as to whether the damages are "substantial" within the meaning of the statute. Because the statutory definition requires that both tests be satisfied, we reach a negative conclusion.

IV. Review of Staff Panel Findings and Recommendations

A. Standards for Review—

The ENO determination envisioned by Congress and the Commission's rule is an objective decision, depending upon the application of specific criteria to the facts of a particular accident. This is especially true of Criterion I, where the question is whether measured releases or radiation levels (or the best estimates of releases or radiation levels for which direct measurements are not available) meet the levels specified in the criteria. Criterion II is somewhat more subjective, at least as to certain of the damage categories. Assessment of dollar amounts of damages that "probably will result" from the accident, prior to any court judgments reducing claims to exact figures, is by nature more difficult than comparison of measured or estimated releases or radiation levels with established levels. The purpose of having objective tests, of course, is to permit their application soon after an accident has occurred in order to speed recoveries in appropriate cases.

While the final determination of this case is our responsibility, we necessarily must rely upon the work of the staff in analyzing the mass of data relevant to the criteria. Our review of the staff's findings first focuses on whether the staff has taken a sufficiently conservative approach to application of the criteria. Also appropriate for close Commission scrutiny are any major legal or policy questions presented, for example, whether a particular category of damages should be included under Criterion II.

Finally, we must examine the record as a whole to determine whether all available data have been assembled and considered, and whether adequate opportunity for public input has been provided.

If the staff's findings are acceptable in the above respects, the remaining questions are quantitative, i.e., whether, based on the record that has been compiled, radiological releases or radiation met the levels specified in Criterion I, and whether damages met the levels specified in Criterion II. In approaching these questions the Commission has not redone the various calculations of doses and radiation levels prepared by the staff. Rather, the Commission's review has focused on whether there is anything apparent in the record as a whole indicating that the staff made any significant errors requiring reanalysis.

B. Criterion I

1. *Conservatism.* Section VIII(A) of the Staff Report discusses the assumptions made by the staff panel in evaluating exposure levels relevant to

Criterion I. As to duration of the accident, the staff assumes that it began on March 28 and ended on May 8, when "all discharges from the reactor were within the dose levels and concentrations specified in Appendix I to 10 CFR Part 50 . . . and 10 CFR Part 20 of the Commission's regulations". While the staff acknowledges that further releases above these levels are possible at TMI, the Report concludes that such releases would be separate "nuclear incidents" within the meaning of the Price-Anderson Act.

For a definition of "offsite", the staff concluded that while the possible choices were separated by less than 100 feet at points nearest to the plant, the definition adopted "include[d] all areas, whether or not owned by the licensee, outside of the owner-controlled area enclosed by the permanent fence on Three Mile Island". (See Staff Report at 14-16). This definition would include some area owned by Metropolitan Edison outside the permanent station fence.

The staff panel considered four possibilities in applying the language of Criterion I referring to "persons offsite [who] were, or could have been, or might be exposed . . .". The panel decided to carry out calculations for three of these possibilities, all of which pertain to the "could have been" category:

Under one assumption, individuals were assumed to be located at points corresponding to the highest recorded doses where, in fact, no individuals are known to have been . . . The Panel also considered a hypothetical person exposed outdoors for the periods of releases of noble gas and iodine from the accident and placed just offsite at spots that the Panel concluded would have seen the highest exposure. Finally, in order to obtain an upper limit for possible exposure to compare against the values in Criterion I, a person was hypothesized to have the ability and knowledge to be transported so as to be in the area of highest radiation exposure during the course of the accident. (Report at 17-18)

The staff added a statistical measurement error to recorded doses corresponding to a 99.9 percent confidence level, and did not include a reduction factor of 1.2 to 2.2 for the demonstrated over-response of thermoluminescent dosimeter to radiation emitted during the accident. These calculational methods would naturally result in projected doses far in excess of the maximum actual dose received by real persons, which was probably on the order of 75 millirem. (See Document 6 to Appendix A of the Staff Report).

We are satisfied that, as to each of the three assumptions, the staff has taken a

suitably conservative approach. The period chosen to delimit the accident encompasses all releases fairly attributable to the March 28 accident itself. We agree that it is appropriate to regard any further elevated releases from the reactor site as separate incidents once the plant has been brought to cold shutdown and release levels have declined to within normal operating range. Similarly, the staff has chosen the most conservative definition of "offsite" for purposes of measuring possible exposure levels.

Finally, it would be difficult to conceive of a more conservative method of calculating possible dose levels than assuming a person constantly moving into the area of highest possible exposure throughout the duration of the accident. In fact, this category probably goes beyond any fair reading of "could have been" exposed. Nevertheless, it does establish, as the Staff Report states, an upper bound of projected doses. If calculations based on this unrealistic scenario did not meet the levels of Criterion I, it is clear that the Criterion has not been met.

2. Legal or Policy Issues. As we have noted above, the application of Criterion I is largely quantitative. When making the comparison of actual or projected doses (or contamination levels) with the levels in the Criterion, however, the question arises, how close must calculated or measured levels be to those in the Criterion in order for it to be met?

There will always be a significant margin of error in measurements of radiation offsite and in calculations which estimate offsite exposures or contamination levels. With this in mind, it is appropriate to regard the thresholds of Criterion I as a guide for the meaning of "substantial" rather than as rigid levels with no allowance for uncertainties. If it appears that calculations based on reasonable scenarios (or actual measurements, if available and sufficiently accurate) enter the basic range of the criterion, e.g. tens of rems for person exposures, we would conclude that the criterion had been met. On the other hand, if this range can only be reached by extreme upper-limit bounding calculations, or when actual measurements and reasonable calculations do not enter this range, we must conclude that the criterion has not been met. We view the range of discretion in applying Criterion I wide, but not to the extent of making the judgment subjective. The purpose of having prospective criteria is to permit the resolution of individual cases on an objective basis. The exercise of

unlimited discretion would frustrate this purpose and would leave our determination subject to criticism for failure to follow our own regulations.

3. Record Supporting the Staff Finding. Appendices E and F to the Staff Report collect the technical data and calculations supporting the finding that Criterion I has not been met. Appendix E approaches the problem from the "source term" perspective, while Appendix F analyzes measurement data. In compiling Appendices E and F, the staff panel drew upon work performed by the NRC staff, other Federal agencies, the State of Pennsylvania, Metropolitan Edison, and industry consultants. Furthermore, the staff had before it the public comments and transcript of the Harrisburg hearing (and statements for the record), some of which addressed the question of radiological releases and offsite exposures.

In reviewing Appendices E and F, we find them to be a detailed and complete analysis of available data. Furthermore, we are unaware of any significant source of data which has been overlooked or inadequately considered. Our conclusion is that the record before us is complete and that adequate provision has been made throughout this proceeding for public comment.

4. Application of Criterion I. Table 16 of Appendix E to the Staff Report summarizes the upper-bound estimates of doses relevant to Criterion I, and compares those doses with the levels in the criterion. These "total" doses are themselves somewhat unrealistic since, as the Report explains, obtaining the total dose listed would require a person to be in two places at once. Table 17 summarizes results for ground contamination.

The upper-bound dose rates are generally an order of magnitude lower than Criterion I levels, ranging from about a factor of four to a factor of 25. (The best estimate of maximum exposure based on a realistic scenario is at least an order of magnitude smaller. See Table 4 to Appendix E.) Ground contamination dose rates range from a factor of several hundred (for gamma) to about six (for beta). Again, realistic estimates would be much lower.

Measurements summarized in Appendix F generally support this analysis. Projected upper-bound doses based on actual measurements range from a factor of 14 below Criterion I (for whole body) to a factor of 6.6 (for skin exposure). Upper bounds on surface contamination were two to three orders of magnitude below the levels of Criterion I (See Appendix F to Staff Report at 63-65).

Based on these calculations and measurements, we must conclude that the radiological consequences of this accident, as to both exposures and surface contamination, did not enter the range of Criterion I in any respect. We accept the conclusion of the Staff Report that Criterion I has not been met.

C. Criterion II

The Staff Panel experienced considerable difficulty in applying Criterion II to this accident. In part, this difficulty was due to the unusual nature of this accident, i.e., severe onsite consequences resulting in relatively small offsite releases of radiation. As the Staff Report points out (note at 25), the assumption that an accident could not meet Criterion II without—almost automatically—meeting Criterion I is not necessarily true. One can envision an accident even more severe than TMI in terms of onsite damage, resulting in widespread evacuation and losses related thereto, yet minor in terms of actual radiological consequences.

The dual nature of the criteria, however, reflect the dual nature of the statutory definition noted above: one must have both "substantial" offsite releases or radiation and "substantial" offsite damages for an ENO to be found. In this case, it is clear that Criterion I has not been met, and thus the Staff Panel did not find it necessary to go beyond pointing out the difficulties in applying Criterion II to an accident of this kind.

The legislative history of the ENO concept, and the background for the criteria, seem to address an accident where rather sudden offsite releases cause personal exposures and contamination to property meeting Criterion I, rather than an accident for long duration causing anxiety—and some evacuation—but not "substantial" effects in radiological terms. In the former case, the estimate of immediate losses—which generate the need for quick recoveries—can be made and the waivers activated if the Criterion II levels are met. In the case of TMI, however, "damages" other than those directly associated with the evacuation (which have, for the most part, already been compensated) can only be ascertained after extended litigation. The actions filed in Harrisburg claim losses for mental suffering, diminution in property values, business losses, and so on—all extremely difficult to estimate numerically. Further, it is by no means clear that Congress intended such indirect damages (that is, not caused by a substantial release of radiation) to be considered as part of the ENO determination.

We find ourselves in agreement with the Staff Panel that application of Criterion II in this case presents difficulties which make an explicit finding almost impossible to reach. Since the Staff Panel found conclusively that Criterion I had not been met, and both Criterion I and Criterion II must be met for there to be an ENO, it decided not to explore the matter further.

This accident demonstrates that Criterion II needs to be addressed by rulemaking to resolve the problems pointed up by the facts of TMI. Such a rulemaking is now under way, in which Criterion I will also be reexamined. Full opportunity for public participation will be provided. It should be noted, however, that while the criteria can be revised by the Commission as appropriate, the basic definition of Section 11(j)—and the Congressional intent behind the ENO concept—must be followed.

D. Public Comments on the Staff Report

Four public comments were received following transmittal of the Staff Report. Of these, only the comment from attorneys representing TMI class action plaintiffs subjects the Staff Report to careful analysis. Four major points are made by this comment: (1) The Commission should use upper-bound dose figures and find that the thresholds of Criterion I have been met, (2) the "Heidelberg Report" should be considered in assessing doses, (3) Damages far exceed the Criterion II thresholds, and (4) A negative ENO determination at this time would be premature. We address these points in order.

We have above accepted the use of upper-bound calculations based upon unrealistic exposure scenarios as a basis for finding that Criterion I is not met. The comment takes issue, however, with the refusal of the Staff Report to consider thyroid exposure of a child at the site boundary, moving in such a way as to be downwind of the plant during the entire release period. The Staff Panel found it "inconceivable that an infant was anywhere near the exclusion boundary". The Staff Panel also found it unrealistic to imagine continuous movement over the entire 43-day period of iodine releases in order to maximize the dose. (Report at 21). The comment claims that using this extreme scenario—a moving child at the site boundary—one could obtain a thyroid dose level meeting that aspect of Criterion I.

As we have indicated above, Criterion I cannot be regarded as met when one of its levels can only be met or approached by an extreme upper-bound calculation

based on an unrealistic scenario. We must agree with the conclusion of the Staff Panel that thyroid exposure of a child held downwind of the plant at the site boundary during the entire 43-day period of iodine release may not be considered a realistic scenario, nor is it even useful as a bounding calculation. While we have accepted the Staff Panel's upper-bound approach as a demonstration that no real persons could have been exposed to substantial amounts of radiation, we cannot go so far as to rest a determination upon total departures from realistically estimated exposures.

The "Heidelberg Report" is not part of the record in this proceeding, nor is it specifically addressed in the Report of the Staff Panel. The comment requests that the "Commission give due weight to the findings of that Report which have great relevance to exposures from plants in the United States". The comment then quotes portions of this report alleged to cast doubt on TMI dose calculations. The comment asks that TMI radiation data be supplied to the University of Heidelberg for analysis based on this report and the results compared with those already reached.

The report (also known as the "Wyhl Report") has been the subject of several recent staff papers. In the first, dated December 10, 1979, the staff informed us that it had performed a preliminary review of this report and had concluded that its dose estimates were unrealistically high when compared to dose estimates based on models used by the NRC. As recently as January 30, 1980, the staff transmitted to us a complete draft review of the "Heidelberg Report". The basic conclusion of this review was unchanged from the earlier staff paper: the "Heidelberg Report" used input parameters which were not supported by environmental monitoring data near nuclear plants in the United States, and hence its dose estimates were from 10 to 10,000 times too high when compared with NRC values or measured environmental radioactivity levels near power reactors. The staff concluded that "the Wyhl Report's estimated dose from vegetation, meat, and milk ingestion is not a realistic dose for the hypothetical maximum individual living near nuclear power plants in the U.S."

It is also important to recognize that the "Heidelberg Report" focuses upon food chain pathways, i.e., estimated doses from vegetation, meat and milk ingestion. The principal exposure pathways at Three Mile Island were external radiation and radiiodine inhalation. Exposures related to the food

chain would be, at most, small fractions of the calculated or estimated exposures used in the Staff Report.

We are therefore satisfied that the staff was well aware of the "Heidelberg Report" during its preparation of the ENO findings, and based upon its analysis of the Report declined to use its dose estimates. The comment here considered provides several brief quotes from the Report, but supplies no basis for concluding that the staff's review is in error. For purposes of this ENO determination, we regard it as sound to use dose calculational models which use environmental monitoring data taken from operating nuclear power plants in the United States, and thus decline to further consider the "Heidelberg Report" in this proceeding.⁸

The comment next presents facts which, it is alleged, show that Criterion II has been met in this case. These facts only serve to emphasize the problems we have already acknowledged in applying Criterion II to this accident. They are academic in this case, however, since we find that Criterion I has not been met.

Finally, the comment argues that a negative determination should not be made "until the possibility of future releases is foreclosed". On this point we strongly disagree. We have above agreed with the conclusion of the Staff Panel that any future releases exceeding Commission regulations must be considered a separate incident. It was the intent of Congress in providing the ENO concept (and the waivers of defenses) that it should be expeditiously applied. This is, in fact, a major reason for precluding judicial review of the Commission's determination. It may well be several more years before Unit 2 has been decontaminated. Our determination should not await the possibility of further releases during that period which could result from clean-up operations. A determination at this time, whether negative or positive, informs the Federal court in Harrisburg of whether the waivers of defenses are to be applied. A negative determination leaves the Court free to apply state tort law to the pending cases without application of any waivers of defenses, the result intended by Congress where an ENO was not found.

Determination

The Commission finds that Criterion I, 10 CFR 140.84, has not been met by the March 28, 1979, accident at Three Mile

⁸ Commissioners Glinesky and Bradford do not believe that the "Heidelberg Report" is relevant to this ENO determination. Consequently they do not think it necessary to reach a conclusion as to the merit.

Island Nuclear Station, Unit 2. The Commission therefore determines that this accident does not constitute an "extraordinary nuclear occurrence" within the meaning of Section 11(j) of the Atomic Energy Act and 10 CFR Part 140 of the Commission's regulations.

Dated at Washington, D.C. this 16th day of April 1980.

For the Commission.

John F. Ahearne,

Chairman.

(FR Doc. 80-12407 Filed 4-23-80; 9:45 am)

BILLING CODE 7590-01-M

[Docket No. 40-8727]

Kerr-McGee Nuclear Corp., Negative Declaration Regarding Issuance of a Source Material License No. SUA-1378 for the South Powder River Basin Ion-Exchange Facility in Converse County, Wyo.

AGENCY: U.S. NUCLEAR REGULATORY COMMISSION.

ACTION: Notice of issuance of the negative declaration and source material license SUA-1378 to Kerr-McGee Nuclear Corporation (40-8727).

SUMMARY: The U.S. Nuclear Regulatory Commission (the Commission) is issuing a source material license for the recovery of uranium by an ion-exchange process on minewater at the Kerr-McGee Nuclear Corporation's South Powder River Basin site in Converse County, Wyoming. The Division of Waste Management staff has prepared an environmental impact appraisal/safety analysis report stating the environmental and safety effects of incorporating a uranium recovery operation at the uranium mine, utilizing the minewater discharge stream as feed, is not significant.

The environmental impact appraisal/safety analysis report is available for public inspection and copying at the Commission's Public Document Room at 1717 H Street, N.W., Washington, D.C. 20555.

Dated at Silver Spring, Maryland, this 9th day of April, 1980

Ross A. Scavano,

Chief Uranium Recovery Licensing Branch,
Division of Waste Management.

(FR Doc. 80-12415 Filed 4-23-80; 9:45 am)

BILLING CODE 7590-01-M

[Docket No. 80-320 (10 CFR 2.206)]

Metropolitan Edison Co., (Three Mile Island Nuclear Station, Unit 2); Issuance of Director's Decision Under 10 CFR 2.206

Notice has been previously published in the Federal Register, 44 FR 40986 (1979), that petitions on April 27 and May 16, 1979, by Chauncey Kepford on behalf of the Environmental Coalition on Nuclear Power (ECNP) were being considered by the Director of Nuclear Reactor Regulation under 10 CFR 2.206 of the Commission's regulations. Upon consideration of the petitions, I have determined that the Commission has essentially satisfied some of the concerns behind ECNP's petitions. With respect to other matters, the petitions are denied, the reasons for this denial are fully stated in a "Director's Decision under 10 CFR 2.206".

Copies of this decision are available for public inspection in the Commission's public document room at 1717 H Street, N.W., Washington, D.C. 20555, and the local public document rooms for the Three Mile Island Nuclear Station at the York College of Pennsylvania, Country Club Road, York, Pennsylvania 17405 and at the State Library of Pennsylvania, Government Publications Section, Education Building, Commonwealth and Walnut Streets, Harrisburg, Pennsylvania 17126. A copy of this decision will also be filed with the Secretary for the Commission's review in accordance with 10 CFR 2.206(c).

Dated at Bethesda, Maryland this 16th day of April, 1980.

For the Nuclear Regulatory Commission.

Harold R. Denton,

Director, Office of Nuclear Reactor Regulation.

(FR Doc. 80-12408 Filed 4-23-80; 9:45 am)

BILLING CODE 7590-01-M

[Docket Nos. 80-282, 80-308]

Northern States Power Co.; Establishment of Atomic Safety and Licensing Board To Preside in Proceeding

Pursuant to delegation by the Commission dated December 29, 1972, published in the Federal Register (37 FR 28710) and Sections 2.103, 2.700, 2.702, 2.714, 2.714a, 2.717 and 2.721 of the Commission's Regulations, all as amended, an Atomic Safety and Licensing Board is being established in the following proceeding to rule on petitions for leave to intervene and/or requests for hearing and to preside over

the proceeding in the event that a hearing is ordered.

Northern States Power Co.

(Prairie Island Nuclear Generating Plant, Unit Nos. 1 and 2)

Facility Operating Licenses Nos. DPR-01 and DPR-02.

This action is in reference to a notice published by the Commission on March 12, 1980, in the Federal Register (45 FR 16056) entitled, "Northern States Power Co.; Proposed Issuance of Amendment to Facility Operating License".

The Chairman of this Board and his address is as follows: Robert M. Lazo, Esq., Atomic Safety and Licensing Board Panel, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

The other members of the Board and their addresses are as follows: Dr. David L. Hetrick, Professor of Nuclear Engineering, University of Arizona, Tucson, Arizona 85721; Dr. Quentin J. Stober, Fisheries Research Institute, University of Washington, Seattle, Washington 98195.

Dated at Bethesda, Maryland, this 16th day of April, 1980.

Robert M. Lazo,

Acting Chairman, Atomic Safety and Licensing Board Panel.

(FR Doc. 80-12412 Filed 4-23-80; 9:45 am)

BILLING CODE 7590-01-M

[Docket No. 70-2808]

Westinghouse Electric Corp.; Establishment of Atomic Safety and Licensing Board To Preside in Proceeding

Pursuant to delegation by the Commission dated December 29, 1972, published in the Federal Register (37 FR 28710) and Sections 2.103, 2.700, 2.702, 2.714, 2.714a, 2.717 and 2.721 of the Commission's Regulations, all as amended, an Atomic Safety and Licensing Board is being established in the following proceeding to rule on petitions for leave to intervene and/or requests for hearing and to preside over the proceeding in the event that a hearing is ordered.

Westinghouse Electric Corp.

(Alabama Nuclear Fuel Fabrication Plant (ANFFP))

Application for a Special Nuclear Material License.

This action is in reference to a notice published by the Commission on March 6, 1980, in the Federal Register (45 FR 14724) entitled, "Availability of Environmental Report, and Intent to Prepare a Draft Environmental Impact Statement Concerning Issuance of a

**NUCLEAR REGULATORY
COMMISSION**

10 CFR Part 140

**Criteria for an Extraordinary Nuclear
Occurrence**

AGENCY: Nuclear Regulatory
Commission

ACTION: Proposed rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is considering amending its regulations to revise the criteria for an "extraordinary nuclear occurrence" (ENO). If a nuclear incident were found by the Commission to be an "extraordinary nuclear occurrence," several legal defenses would be waived including the necessity of persons with damage claims to prove negligence. The proposed changes are designed to simplify the administrative criteria used by the Commission in making an ENO determination and to avoid the problems encountered by the Commission in applying the existing criteria to the accident at the Three Mile Island nuclear plant (TMI). These proposed changes will affect applicants for and holders of NRC licenses for production and utilization facilities and other persons indemnified as to such facilities.

DATE: The comment period expires on August 7, 1985. Comments received after that date will be considered if it is practical to do so, but assurance of consideration cannot be given unless the comments are filed on or before that date.

ADDRESSES: All interested persons who desire to submit written comments or suggestions in connection with this proposed rule should send them to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch. Copies of all documents received may be examined and copied in the Commission's Public Document Room at 1717 H Street NW., Washington, DC.

FOR FURTHER INFORMATION

CONTACT: H.T. Peterson, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone (301) 427-4578.

SUPPLEMENTARY INFORMATION

I. Background

In the event of a nuclear incident, claims for injuries or damages can be brought against the plant licensee and other parties considered responsible for the incident. The Price-Anderson provisions of the Atomic Energy Act

(AEA) of 1954, as amended, (section 170) provide a system of private insurance and electric utility funds totaling over \$300 million to pay public liability claims. One of the principal obstacles to a claimant's recovery for injuries or damages could be the necessity for the claimant to prove negligence on the part of the defendants or the absence of contributory negligence on the part of the claimant. Congress attempted to remove this obstacle in 1980 by amending the Price-Anderson Act to require the waiver of certain defenses by an indemnified person when the nuclear accident magnitude "triggered" the ENO criteria.

When the Commission determines that a nuclear incident is an "extraordinary nuclear occurrence" within the meaning of the Act and the Commission's regulations, the waiver of defenses provisions contained in the insurance policies and indemnity agreements implementing the Price-Anderson system are activated. As provided by section 170n(1) of the Atomic Energy Act of 1954, as amended, the waived defenses include:

- (i) Any issue or defense as to the conduct of the claimant or fault of persons indemnified,
- (ii) Any issue or defense, as to charitable or governmental immunity, and
- (iii) Any issue or defense based on any statute of limitation if suit is

instituted within three years from the date on which the claimant first knew, or reasonably could have known, of his injury or damage and the cause thereof, but in no event more than twenty years after the date of the nuclear incident.

The waivers of defenses, once triggered by an ENO determination by the Commission, relieve the claimant of having to prove negligence by a defendant and of having to disprove defenses such as contributory negligence. Whether or not an ENO is declared, however, a claimant would still have to prove: (a) Personal injury or damage, (b) amount of monetary loss, and (c) the causal link between the claimant's loss and the radioactive material released.

The term "extraordinary nuclear occurrence" is defined by section 11(j) of the Atomic Energy Act as follows:

The term "extraordinary nuclear occurrence" means any event causing a discharge or dispersal of source, special nuclear, or byproduct material from its intended place of confinement in amounts offsite, or causing radiation levels offsite, which the Commission determines to be substantial, and which the Commission determines has resulted

to probably will result in substantial damages to persons offsite or property offsite.

This provision clearly calls for a two-pronged determination: (a) Substantial offsite release or substantial offsite radiation, and (b) actual or prospective substantial offsite damages. This section also requires the Commission to "establish criteria in writing" for application of these tests to specific events.

The Commission's present regulations were established in 1968 (33 FR 15996) and are found in 10 CFR 140.84 and 140.85. Consistent with the statutory definition, for the Commission to determine that there has been an ENO, the Commission must find that both substantial releases of radioactive materials or substantial offsite doses and substantial injury or substantial damages have occurred (both Criterion I and Criterion II must be met). The language of the regulation, especially that related to Criterion I, is rather technical and precise.

Criterion I

Criterion I relates to whether there has been a substantial discharge or dispersal of radioactive material offsite, or whether there has been a substantial level of radiation offsite. Criterion I calls for such a finding when radioactive material is released from its intended place of confinement or radiation levels occur offsite and either of the following findings are also made:

a. That one or more persons offsite were, could have been, or might be exposed to radiation or to radioactive material, resulting in a dose or in a projected dose in excess of one of the levels in the following table:

TABLE I.—TOTAL PROJECTED RADIATION DOSES

Critical organ	Dose (rem)
Thyroid	30
Whole body	30
Bone Marrow	30
Skin	60
Other organs or tissues	30

In measuring or projecting doses, exposures from the following types of radiation shall be included:

- (1) Radiation from sources external to the body;
- (2) Radioactive material that may be taken into the body from air or water; and
- (3) Radioactive material that may be taken into the body from its occurrence in food or on terrestrial surfaces.

or

b. (1) Surface contamination of at least a total of any 100 square meters of offsite property has occurred as a result of a release of radioactive material from a production or utilization facility and such contamination is characterized by levels of radiation in excess of one of the values listed in column 1 or column 2 of the following table, or

(2) Surface contamination of any offsite property has occurred as the result of a release of radioactive material in the course of transportation and such contamination is characterized by levels of radiation in excess of one of the values in column 2 of the following table:

TABLE II.—TOTAL SURFACE CONTAMINATION LEVELS¹

Type of emitter	Column 1	Column 2
	Offsite property contiguous to site, owned or leased by a person with whom an indemnity agreement is executed.	Other offsite property
Alpha emission from transuranic isotopes.	3.5 microcuries per square meter.	0.35 microcuries per square meter.
Alpha emission from isotopes other than transuranic isotopes.	35 microcuries per square meter.	3.5 microcuries per square meter.
Beta or gamma emission.	40 mR/hr at 1 cm. (measured through not more than 7 milligrams per square centimeter of total absorber).	4 mR/hr at 1 cm. (measured through not more than 7 milligrams per square centimeter of total absorber).

¹ The maximum levels (above background), observed or projected, 6 or more hours after initial deposition.

If Criterion I is satisfied, Criterion II must then be applied.

Criterion II

Criterion II is satisfied if any of the following findings is made:

(1) The event has resulted in the death or hospitalization, within 30 days of the event, of five or more people located offsite showing objective clinical evidence of physical injury from exposure to the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material; or

(2) \$2,500,000 or more of damage offsite has been or will probably be sustained by any one person, or \$5 million or more of such damage in total has been or will probably be sustained, as the result of such event; or

(3) \$5,000 or more of damage offsite has been or will probably be sustained by each of 50 or more persons, provided that \$1 million or more of such damage

in the aggregate has been or will probably be sustained, as the result of such events.

The term "damage" refers to damage arising out of or resulting from the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material, and shall be based upon estimates of one or more of the following:

- (1) Total cost necessary to put affected property back into use.
- (2) Loss of use of affected property.
- (3) Value of affected property where not practical to restore to use.
- (4) Financial loss resulting from protective actions such as evacuation appropriate to reduce or avoid exposure to radiation or to radioactive materials.

II. Problems in Application

The accident at the Three Mile Island Nuclear Power Station, Unit 2, on March 28, 1979 uncovered several problems in applying the existing ENO criteria in 10 CFR 140.84 and 140.85. The Commission's determination that the accident at TMI was not an "extraordinary nuclear occurrence" was published in the Federal Register on April 23, 1980 (45 FR 27590). This determination was based in part on NRC staff report NUREG-0637, "Report to the Nuclear Regulatory Commission from the Staff Panel on the Commission's Determination of an Extraordinary Nuclear Occurrence (ENO)", dated January 1980. This report is available for inspection in the Commission's Public Document Room at 1717 H Street NW., Washington, DC. A single copy of the report NUREG-0637 may be obtained free upon request from the Nuclear Regulatory Commission, Publication Services Section, Washington, DC 20555.

Basically, there are problems with the existing ENO criteria. These problems are:

1. Several of the dose criteria for "substantial releases" in the present regulation were formulated in part to be consistent with the then effective Protective Action Guides. Since 1968 proposed Protective Action Guides have been reformulated at lower dose levels.

2. The current Criterion II for "substantial injury" requires objective clinical evidence of radiation injury. However, tests for evidence of such injury are not necessarily conclusive proof of radiological injury. For example, psychological stress can manifest some physical symptoms similar to those associated with acute radiation injury.

3. Monetary damages in Criterion II were difficult, if not impossible, to

evaluate accurately in a timely manner. For example, in the ENO determination for the Three Mile Island Accident, compensation costs such as payments for evacuation were evaluated and tabulated. However, many damages, such as diminution of property values and business losses, required court adjudication before the proper compensation could be awarded.

III. Proposed Criteria

The Commission is proposing for comment three different options for determining whether an accident was an extraordinary nuclear occurrence. The first and second options retain the structure of the existing criteria and contain explicit criteria for both substantial releases and substantial damages. These options employ estimates of offsite doses and ground contamination as indicators of substantial releases but have separate criteria for substantial damages. These two options also seek to avoid the measurement problems encountered in applying the present criteria for "substantial damages" by focusing the criteria on costs which can be readily counted or estimated. The first two options differ in that the Commission is proposing alternative wording of these criteria for public comment.

The Commission is also interested in obtaining public comments on a third option for defining an ENO. This third option represents a new and arguably more simplified approach to arrive at ENO criteria which could be readily evaluated following a nuclear accident. This option focuses on establishing that a major release of radioactive materials has occurred with concomitant high offsite radiation levels or contamination. It does not require that doses to individuals be evaluated, nor does it require that property damage estimates or evacuation characteristics be evaluated. Further, this criterion for substantial releases does not require the NRC staff to evaluate exposure conditions such as occupancy time or building shielding factors for actual or hypothetical individuals and, consequently, would simplify the data collection and analysis following an accident. Thus, this option may be viewed as more straight forward than the other option. It allows for direct measurement of discharge of material or radiation levels, and by virtue of the strong causal relation between release of radionuclides and damages, it defines, by direct measurement, the conditions under which the Criterion II requirement of substantial damages is met. Therefore, its intent is that

procedural barriers to a rapid determination should be minimized.

Option 1

Criterion I is a mechanism for determining that a substantial release of radioactive material or radiation offsite has occurred. Currently Criterion I specifies a 20-rem (0.2-sievert)* whole body dose to one person offsite with higher values for specific organs. The proposed regulation would lower these levels to a 5-rem whole body dose with correspondingly lower organs doses. This proposed modification has been selected to be numerically consistent with Protective Action Guides proposed by the Environmental Protection Agency¹ and those issued by the Food and Drug Administration.² This ensures that any nuclear accident which would have warranted protective actions will be found to involve a substantial release of radioactive materials which satisfy the first condition for an ENO determination.

The proposed dose levels for Criterion I, which would define levels of "substantial releases or substantial offsite doses" for screening purposes, are in the range of the occupational dose limits and hence could be regarded as too low to be viewed as being "substantial." However, these doses are substantially above the doses to the general public expected from normal operation of NRC-licensed facilities as limited by § 20.105 of 10 CFR Part 20 and, in that sense, constitute criteria for "substantial releases."

The words " . . . one or more persons offsite were, could have been or might be exposed . . . " in the current criterion would be replaced with the proposed words: " . . . one or more persons offsite were or will probably be exposed . . . " This proposal will remove the necessity to evaluate highly improbable "might have been" conditions in favor of conditions which would be more likely to occur.

The surface contamination levels in Criterion I will not be changed as those levels are consistent with proposed emergency response levels. The existing procedures in § 140.84(b) are inexpensive and can be performed

rapidly. Although more sophisticated measurement techniques are available and specific radionuclide levels could be measured, the existing simpler tests provide adequate indication of contamination levels for an ENO determination.

Criterion II, which defines substantial damages, would be changed extensively. Instead of the present criterion based upon the total monetary worth of damages or clinical evidence of radiation injury, the proposed Criterion II for the amount of damages represents items for which information is readily available within the time frame for an ENO determination. For each of the monetary requirements, the total valuation is assumed to be equivalent to a loss of \$2.5 million. This value is in the present ENO criterion as the amount of loss to a single individual which would constitute an ENO. The Commission no longer believes it necessary or useful to specify different amounts of monetary damages depending upon the number of people affected.

Criterion II (1) accounts for human injury. One alternative that the Commission is considering would replace the current criterion for clinical injury to 5 or more people with a requirement that 5 or more receive radiation doses which are in the range that would produce symptoms of "radiation sickness." For the purpose of this evaluation, clinical findings of radiation injury in the current criteria would not be required, only a showing that five or more people received doses in excess of 100 rads (1 Gy).³ This is expressed in rads because the unit of dose equivalent (rem or sievert) requires a dose quality factor (QF) be used. In the range of doses which could cause acute injury such as the 100-rem (1-sievert) dose, the appropriate quality factor is dependent upon the specific biological end point.

In evaluating the doses for defining "substantial injury", the Commission intends that the methodology used for the evaluations be realistic rather than overly conservative. Parameters and models used in Regulatory Guide 1.109⁴ are suitable for this purpose to the extent that they apply to accident conditions.

In this proposal, the present monetary values for property damage in the

* A sievert (Sv) is the SI unit of dose equivalent: 1 Sv = 100 rem; 1 rem = 0.01 sievert (1 cSv) or 0.01 sievert.

¹ Environmental Protection Agency, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" EPA Report EPA-620/1-75-001 (Revised June 1980).

² Food and Drug Administration "Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendation for State and Local Agencies," published in the Federal Register on October 22, 1982 (47 FR 47073).

³ Gray is the SI unit of absorbed dose. 1 Gy = 100 rads; 1 rad = 0.01 gray.

⁴ Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 20, Appendix I." Available from Director, Division of Technical Information and Document Control, USNRC, Washington, DC 20555.

existing Criterion II would be replaced by things that could be readily counted or estimated within a relatively short time following an accident, such as tax assessments, numbers of people unemployed, and numbers of people evacuated. In Criterion II (2), the assessed value of property requiring decontamination is used as an index of damage. Criterion II (3) is based upon an assumed loss (to the person directly affected and others) of \$100 per person-day of lost employment. In Criterion II (4) a cost of \$25 per person-day for evacuees is used to arrive at the number of evacuees equivalent to the \$2.5 million loss.

Option #2—Commissioner Assestine's Proposals

Commissioner Assestine has proposed alternatives to criteria for defining substantial releases and for specifying substantial injury. In Criterion I, in place of the change proposed in Option #1 for redefining substantial releases, Commissioner Assestine would prefer that, instead of the present Part 140 wording: "... one or more persons were, could have been or might be exposed ..." the text would read:

"... a person or persons on or near any site boundary throughout the duration of the accident ..."

This permits the Commission to make the ENO evaluation based upon the estimated dose to an individual who possibly was at or near the site boundary throughout the course of the accident. As was the case with Option #1, this proposal also eliminates the uncertain "might have been" condition and employs the proposed revised dose criteria.

An alternative criterion for defining substantial injury has been proposed by Commissioner Assestine. This alternative represents a change from using acute injury, such as in the present criterion for "objective clinical evidence of radiation injury" to five people or the death of the five people, or using a high dose to a few exposed individuals such as the 100-rem (1 sievert) dose to five people proposed in Option #1. Option #2 would use a requirement that a 100,000 person-rem (1,000 person-sieverts) collective dose delivered to the population within fifty miles as only indication of the potential impact of the accident on the surrounding population. This is consistent with findings that the latent effects of a serious nuclear accident could far outweigh the observable acute effects.

The proposed changes to the criteria for substantial damage are those proposed in Option #1.

Option #3—Commissioner Bernthal's Proposal

The rule presented as Options #1 and #2 resemble the existing ENO criteria in 10 CFR Part 140, Subpart E, in several respects. The proposed organization is similar in that separate criteria are retained for substantial releases and doses and for substantial injury or damage. Both sets of criteria require the evaluation of doses to people. This might require that data on occupancy times, food consumption, and movement be collected for those people living in the immediate vicinity of the facility or accident site. Both Option #1, Option #2, and the existing criteria require enumeration and evaluation of damages. Although these options restrict the damages that the Commission must consider to those which can be more readily evaluated, the time and effort required for such an analysis could still be large. Moreover, damage costs or values could be required for property other than taxable property such as municipal utilities, churches, and schools. Although Option #1 and Option #2 would rectify a number of the problems with the existing ENO criteria, they do not represent a radical departure from them and fail to solve totally the problems associated with evaluation of damages.

The statutory definition of an ENO permits the Commission to make a definition that an ENO has occurred if there have been substantial releases of radioactive materials or substantial offsite doses which have resulted or will probably result in substantial injury or substantial damages. The current criteria and the revisions proposed above place more emphasis on releases of radioactive materials "which have resulted" in substantial injury or damage and thus require a detailed enumeration of such injuries or damages as have occurred. Option #3 proposed by Commissioner Bernthal suggests a different approach to decide whether a nuclear accident is an extraordinary nuclear occurrence in that it emphasizes the "will probably result" aspect in dealing with substantial injury or damages. Rather than requiring enumeration and evaluation of actual damages and identification of actual injuries, the Option #3 simplifies the Commission's task to identifying those conditions which could lead to injury or damages.

The ENO criteria in Option #3 depart from the two-tiered approach which first requires a finding that substantial releases (or doses) occurred and then determining that substantial injury or damages resulted. Instead, one set of

criteria is given for the magnitude of releases and doses that the Commission believes will satisfy the conditions for both substantial releases and will probably result in injury or substantial damages.

A principal basis of an ENO determination is that an event occurred which released radioactive materials in such quantities that the event is clearly "extraordinary" compared to normal operation. This provides the threshold level to ensure that the waivers of defenses and other legal provisions of the Price-Anderson amendments of 1966 are not activated as a result of minor expected operational occurrences. Options #1 and #2 and the present criteria for substantial release set this threshold at a low level to provide a "trigger" for identifying events which might be classed extraordinary nuclear occurrences. Section 140.81(a) of 10 CFR Part 140 clearly states that the present criterion is below that where substantial injury or damage would result. This is also true for the proposed revisions especially as the numerical criterion for substantial releases is less than in the existing Part 140.

For Option #3, a release of radioactive materials which results in doses or dose rates offsite of a magnitude equal to or greater than the proposed criterion will suffice to demonstrate that substantial releases of offsite doses have occurred and that substantial damage will probably occur. Enumeration of actual damages is not required to satisfy the criterion. Based upon the experience with the ENO determination for the Three Mile Island accident, this simplification would be of great value to a prompt ENO determination. The Commission believes that such simplification warrants the issuance of this novel proposal for public comment.

Of the three conditions associated with Option #3, Conditions (a) and (b) apply primarily to accidents at commercial light-water reactors. Condition (a) applies to surface contamination which would result from deposited radioactive materials from serious accidents releasing particulates or semi-volatile materials. Condition (a) is considered a threshold for damage requiring extensive decontamination. Damage requiring interdiction or damage resulting in significant harm to people (early injuries, early deaths and latent effects) is considered well above this threshold and, therefore, is adequately covered by this condition. Condition (b) uses a 24-hour integrated dose of 10 rad (0.1 gray) as a measure of the dose which could be received by an

individual from releases including those from accidents from which only the noble gases are released. This dose criterion does not use the dose received by a specific individual or group of individuals. Rather, it is the dose which could have been received during the duration of the accident. The values of these conditions were selected to be far above doses or exposure rates which could occur from normal operation under existing radiation protection standards.

Commissioner Bernthal's proposal (Option #3) relies on the "will probably occur" aspect of the statutory ENO definition. It should be noted that this option would trigger the waivers of defenses and other resultant actions of an affirmative ENO determination without first having to establish that substantial injuries or damages have actually occurred. The criterion in Option #3 should ensure that an affirmative ENO determination will be reached in any situation which would give rise to substantial injury or damage, and, conversely, that it would be difficult to exceed the criterion in situations where accident consequences were minor. This should provide the threshold intended by the ENO concept.

IV. Petition for Rulemaking

In a petition (PRM-140-1) to the NRC, the Public Citizens Litigation Group and Critical Mass Energy Project requested that the accident at the Three Mile Island Nuclear Station Unit No. 2 be found to be an ENO. This portion of the petition was considered as part of the ENO determination already initiated by the Commission. The Commission later determined (as published in the Federal Register on April 23, 1980 [45 FR 27590]) that the Three Mile Island Accident was not an ENO as defined in the Atomic Energy Act and the Commission's regulations.

The petitioners also requested that the Commission make the criteria for determination of an ENO more in line with the intent of Congress. Notice of receipt of the petition and a request for public comment were published in the Federal Register on August 28, 1975 (44 FR 50419). One public comment was received regarding the ENO criteria. The commenter, an official of a nuclear utility, believed that the current criteria for determining an ENO are reasonable. The commenter stated that Congress intended that the waiver of defenses be limited to incidents resulting in significant injury or loss and that the current criteria are consistent with this. The commenter also believed that lowering the threshold for an ENO would lead to higher premiums for

insurance coverage and could at some point endanger the availability of insurance coverage.

The Commission believes that the existing ENO criteria are consistent with the Atomic Energy Act definition of an ENO. However, based upon the experience during the Three Mile Island ENO determination, the Commission is proposing revised ENO criteria which are more practicable than the present regulation. Because the proposed regulations revise the standards against which an ENO determination will be made, the PCLG-CMEP petition for revised ENO criteria is granted in part.

The Commission believes that none of the proposed criteria will affect insurance premiums. During the 1986 Congressional hearings on the ENO, representatives of the insurance industry testified that experience with claims would be the principal determinant of insurance premiums and that institution of the waivers of defenses would not be expected to have any effect on premiums.

The proposed modifications to the ENO criteria would not have changed the outcome of the ENO decision for the Three Mile Island accident. That accident would not have exceeded the proposed dose criteria or the surface contamination criteria and, consequently, would not have been found to be an ENO under existing or any of the proposed regulations.

Additional Comments of Commissioner Bernthal

Although the proposed criteria for an ENO in Option 1 are improvements to those currently in Part 140, substantial problems remain, problems that would be largely eliminated by the inherent simplicity of Option 3. The basis of Option 3 is the definition of two simple, objective dose measurements that directly satisfy the requirement of Criterion I; i.e., they are a measure of "Substantial Discharge of Radioactive Material or Substantial Radiation Levels Offsite." Moreover, these two measures are sufficiently correlated with "Substantial Damages to Persons Offsite or Property Offsite" (the definition of Criterion II) that there is no need for further considerations in order to satisfy Criterion II. For the special case of release of radionuclides that produce little or no gamma radiation, Option 3 here incorporates, with minor clarifying

modifications, the relevant part of the existing rule.

In justifying this approach, it is useful first to consider some of the specific problems in Option 1. Second, the characteristics of damages to people and property must be considered, in order to establish what constitutes "substantial" damages. Finally, analyses which correlate "substantial damages" with the measures of radionuclide release recommended here will be discussed.

Option 1 of the proposed Part 140 rule is evidently complicated, and unnecessarily so. Demonstrating that the criteria for an ENO have been met may be difficult under Option 1, and the proposed rule itself suffers from inconsistencies. For example, with reference to:

A. Criterion I (Defined as "Substantial Discharge of Radioactive Material or Substantial Radiation Levels") Part (a):

- In order to "measure" Part (a), one must be able to track two paths: the path of the persons at risk and the path of the plume of radionuclides. It is the intersection of these two paths that will determine the dose to persons, but the two pathways may never be known well enough to make a reliable determination of dose. (Doses cannot be measured after the fact.)

- It is doubtful one would know the compositions of the plume (radioactive cloud) in terms of radionuclides, particle sizes, and chemistry, sufficiently well to rely on them for calculating the critical parameters, i.e., damage to human beings and the dose to specific human organs.

- Since persons must actually be exposed to meet this criterion (e.g., 15 rems (0.15 sieverts) to the thyroid), it is a measure of exposure and possible damage (cf. Criterion II), not a measure of discharge or radiation level. Must people be present before a discharge or radiation level threshold can be established? [This problem is also addressed in the proposed revision to Criterion I(a) found in Option 2, but the problem of identifying the intersection of the two pathways remains.]

B. Criterion I Part (b)(1):

- For nuclear power plants, the breakdown into two alpha-emission groups is unnecessary.

- It is not clear whether each of the 100 square meters must be contaminated in excess of those levels in the table, or whether there need only be some contamination evident over 100 contiguous square meters. In the latter case, a single localized pocket or object of radioactivity could cause the criteria for an ENO to be met, even though the

*Testimony of D.C. Thomas with E.A. Lowie, R. Fisher, L. Senger, W.M. Smith and J.H. Merritt, "Proposed Amendments to Price-Anderson Act Relating to Waiver of Defenses," Hearings before the Joint Committee on Atomic Energy, 89th Congress, June, 1966. Superintendent of Documents, GPO 1966, page 120.

median and modal contamination per square meter might be very low.

C. Criterion II (Defined as "Substantial Damages to Persons Offsite or Property Offsite") Part (1):

- This is the only criterion for substantial radiation damage to persons, and the threshold is very high. Consider, for example, that the exposure of 5,000 people to 80 rads (0.8 grays) each would still fall below the threshold criterion for radiation damage to persons.

- If four persons were exposed to 600 rads each (6 grays) (lethal dose), the criterion would not be met.

D. Criterion II Part (2):

- The valuation itself of taxable property could be time-consuming and cumbersome, and leaves open the question of how one would quickly establish the value of items other than taxable property (e.g., cemeteries, municipal sewer systems, churches). The ENO finding must be made within a reasonable period of time.

E. Criterion II Part (3):

- An "Employment Loss" criterion could act as a disincentive for employees to return to work or for employers to require return to work. In any case, such numbers may in practice be difficult to measure.

F. Criterion II Part (4):

- This criterion depends more on the declaration of a general emergency than on damage to persons. There may well be declarations of general emergencies (with accompanying evacuation) without any release of radionuclides. The criterion could act as an incentive (or disincentive) to declaring a general emergency. There could also be an incentive to stay away from home in order to contribute to the threshold for waiving defenses.

In summary, it seems clear that Option 1 is so flawed as to call into question its practicality and applicability in any realistic circumstance. On the other hand, to demonstrate the suitability of an alternative, Option 3, it is important to establish a realistic definition of "substantial damages" to persons and property, and to relate that definition to a readily measurable radiological release.

Radiological releases from nuclear power plants under accident conditions are expected to fall into two categories: (1) Releases characterized by a mix of particulates, volatiles, and gases; and (2) releases consisting principally of noble gases (Xe, Kr). For the first category, significant contamination of property would very likely be evident and dominant long before direct health effects are determined to be present and would therefore represent a

conservative and early indicator of harm.

Literature on the subject suggests a hierarchy of "damage thresholds" that can be reasonably correlated with dose rates in the case of property and with integrated doses in the case of persons. For example, the literature suggests readily measurable criteria as follows, in order of increasing severity: (1) Damage not requiring decontamination, such as that to milk and crops; (2) damage requiring decontamination; (3) damage requiring interdiction; i.e., physical isolation and exclusion of the public from contaminated areas for an indefinite period of time; (4) early injuries; and finally, (5) early fatalities.

Latent (cancer, fatalities or genetic effects) are not included in such a tabulation because neither has a "threshold"; both are normally treated in a probabilistic fashion. Moreover, the incidence of these important latent health effects is characterized by doses well above the threshold for decontamination. The first item (milk and crops), on the other hand, involves relatively low cost damages (e.g., contaminated milk and crops are purchased and disposed of) and having costs that are unambiguous (e.g., the cost of buying milk and disposing of it can be clearly documented). Thus, there is little reason to set the threshold of "significant" damage this low.

On the other hand, costs become much more significant when decontamination becomes necessary. Decontamination may involve repaving roads, putting new roofs on homes, and deep plowing of farm lands and/or soil removal. Such costs very quickly would escalate to many millions of dollars—certainly "significant" as defined in this proposed rule. Costs involved in interdiction are still higher. Thus, a reasonable threshold to establish "significant damages" to property for ENO purposes is that level of damage which requires decontamination.

The remaining question is whether the "decontamination threshold" for

significant damage correlates with an easily measurable dose-rate or integrated dose. As a guideline, studies^a have proposed that decontamination should be required if the integrated dose over 30 years is expected to be greater than about 25 rem (0.25 sieverts). For a representative mix of radionuclides such as that expected to be released in an accident, such an integrated long-term dose would be indicated by 10 millirad/hr (0.10 milligray/hr) measured at 1 meter from the ground surface within a few hours after the release. Dose rates substantially higher than this would require interdiction, and could lead to significant latent and genetic effects and even risk of early injury or death.

Of course, the relation between the damage measures described above and the doses at various offsite locations are a function of variables such as meteorological conditions, plume characterizations, population distribution, and isotopic mixes of radionuclides. Specifically, studies show that:

1. Surface contamination dose rate is a good general dose measure—it correlates well with damage measures.

2. For a wide variation of accident conditions, the postulated decontamination threshold dose rate of 10 millirad/hr (0.10 milligray/hr) covers cases where costs of decontamination would be significant (i.e., at least a few million dollars).

3. For virtually all conceivable accident conditions, the threshold rate of 10 millirad/hr (0.10 milligray/hr) would envelop interdiction and all health effects (cancer, genetic effects and early casualties). The exception is the case of release of noble gases only. This case is addressed in category 2, described below.

4. TMI-2 accident releases resulted in surface contamination dose rates well below the 10 millirad (0.10 milligray/hr) threshold.

5. Accidents characterized by containment building failure (other than basemat melt-through) all are expected to result in peak surface dose rates well above 10 millirad/hr (0.10 milligray/hr).

6. Accidents characterized by no containment building failure all are expected to result in peak surface dose rates well below 10 millirad/hr (0.10 milligray/hr).

For the second category of release, that of only noble gas release, there is no lasting ground contamination and the

^a a. Food and Drug Administration, Emergency Protective Action Guides, Federal Register, Vol. 47, # 205, October 22, 1982, (47 FR 47073).

b. U.S. Nuclear Regulatory Commission, "Reactor Safety Study—An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants," WASH-1400 (NUREG-75/014), Appendix B, October 1975.

c. Recommendations of the International Commission on Radiological Protection, Report # 8, September 1985.

d. Federal Radiation Council Staff Report # 5, 1964, "Background for Development of Radiation Protection Standards."

e. Medical Research Council of Great Britain, 1975, "Criteria for Controlling Radiation Doses to the Public after Accidental Escapes of Radioactive Material," Her Majesty's Stationary Office.

^a a. Ibid. ^b b.

b. U.S. Nuclear Regulatory Commission, "Overview of the Reactor Safety Study Consequence Model" (NUREG-0340), October 1977.

damage to persons as a consequence of plume exposure dominates. An appropriate threshold dose for damage in this case can be as low as 10 rads (0.10 gray) integrated over 24 hours, since a noble gas plume passage is highly likely to be concluded within a few hours. This dose can be considered substantial since it is twice the value that triggers Protective Action as established by the FDA and the EPA.

Key to the entire approach suggested here is the fact that the proposed threshold surface contamination dose rate can be easily measured and confirmed by NRC shortly after an accident; the integrated dose would be monitored by the network of 40-50 TLD's located at each reactor site. (Needless to say, adequate dosimetry equipment in the vicinity of nuclear power plants is essential.)

For completeness, Criterion (c) has been included to cover the special cases where a radionuclide release might not involve significant gamma radiation, but might instead produce surface contamination by alpha and/or beta radiation emitters. Such hypothetical releases will be limited to events that might be associated with transportation of nuclear materials, operation of certain non-power plant reactor facilities, or operation of certain other special production and utilization facilities. Criterion (c) in Option 3 is taken directly from 10 CFR 140.84(b)(2) with minor clarifying modifications. The footnotes in that part of the existing rule have also been omitted because they are subject to misinterpretation and appear to be unnecessary.

In summary, radionuclide releases are sufficiently correlated with expected damage from such releases to establish a causal relationship between Criterion I and "Substantial Damages to Persons Offsite or Property Offsite." Therefore, no Criterion II as such is needed. The expected correlation between Criterion I and "substantial damages" suggests that the advantages to this approach far outweigh the disadvantages.

Paperwork Reduction Act Statement

The proposed rule contains no new information collection requirements and therefore is not subject to the requirements of the Paperwork Reduction Act of 1980 (44 U.S.C. 3501, et seq.).

Regulatory Flexibility Certification

In accordance with the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b), the Commission hereby certifies that this rule will not, if promulgated, have a significant economic impact on a substantial number of small entities.

The proposed rule would affect NRC licenses of production and utilization facilities and the nuclear liability insurance underwriting pools. The companies that own the production and utilization facilities and the insurance pools do not fall within the definition of a small business found in section 3 of the Small Business Act, 15 U.S.C. 932, or within the Small Business Size Standards set forth in 13 CFR Part 121.

List of Subjects in 10 CFR Part 140

Extraordinary nuclear occurrence, Insurance, Intergovernmental relations, Nuclear materials, Nuclear power plants and reactors, Penalty, Reporting and recordkeeping requirements.

For the reasons set out in the preamble and under the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and 5 U.S.C. 553, notice is hereby given that adoption of the following amendments to 10 CFR Part 140 is contemplated.

PART 140—FINANCIAL PROTECTION REQUIREMENTS AND INDEMNITY AGREEMENTS

1. The authority citation for Part 140 is revised to read as follows:

Authority: Secs. 161, 170, 66 Stat. 942, 71 Stat. 578, as amended (42 U.S.C. 2201, 2210); secs. 201, 202, 78 Stat. 1242, as amended, 1244 (42 U.S.C. 5841, 5842).

For the purposes of sec. 223, 66 Stat. 958, as amended (42 U.S.C. 2273); §§ 140.11(a), 140.12(a), 140.13 and 140.13a are issued under sec. 161b, 66 Stat. 948, as amended (42 U.S.C. 2201(b)); and § 170.6 is issued under sec. 161c, 66 Stat. 952, as amended (42 U.S.C. 2201(c)).

Proposed Amendments—Option #1

1. In § 140.84, paragraph (a) is revised to read as follows:

§ 140.84 Criterion I—Substantial discharge of radioactive material or substantial radiation levels offsite.

(a) The Commission finds that one or more of the persons offsite has been or probably will be exposed to radiation or radioactive materials which would result in estimated doses in excess of any one of the levels in the following table:

TABLE 1.—TOTAL PROJECTED COMMITTED RADIATION DOSE

Organ	Dose (rads)	Dose (mSv)
Total body	5	0.05
Thyroid	15	0.15
Bone marrow	5	0.05
Bone (surface or internal)	15	0.15
Skin	50	0.50

TABLE 1.—TOTAL PROJECTED COMMITTED RADIATION DOSE—Continued

Organ	Dose (rads)	Dose (mSv)
Other organs or tissues	10	0.1

Exposures from the following types of sources of radiation shall be included:

- (1) Radiation from sources external to the body;
- (2) Radiation material that may be taken into the body from its occurrence in air or water;
- (3) Radiation material that may be taken into the body from its occurrence in food or on terrestrial surfaces; and
- (4) Radiation from sources internal to the body.

2. Section 140.85 is revised to read as follows:

§ 140.85 Criterion II—Substantial damages to persons offsite or property offsite.

After the Commission finds that an event has satisfied Criterion I, the Commission will determine that the event has resulted or will probably result in substantial damages to persons offsite or property offsite when any of the following conditions are satisfied:

(a) Five or more people have received a radiation dose equivalent to the whole body or any organ in excess of 100 rads (1 gray) during the course of the accident.

(b) Offsite property having a value of \$2,500,000 is contaminated with radioactive materials in excess of the levels in § 140.84(b). The valuation shall be based on market value taking into account the ratio of assessed value/market in each tax assessment jurisdiction.

(c) Employment loss of at least 25,000 person-days had occurred.

(d) Evacuation of at least 100,000 person-days has occurred as a result of an evacuation ordered by a State or local official with the authority to make such an order. For the purpose of this regulation, the evacuation period will end when the evacuation order is rescinded by this or another responsible official and when it is determined that the evacuated area may be reoccupied.

Option #2

1. In Subpart E of 10 CFR Part 140, § 140.84 paragraph (a) is revised to read as follows:

§ 140.84 Criterion I—Substantial discharge of radioactive material or substantial radiation levels offsite.

(a) The Commission finds that any of the following doses were or could have been received by a person or persons located on or near any site boundary throughout the duration of the accident:

TABLE 1.—TOTAL PROJECTED COMMITTED RADIATION DOSE

Organ	Dose (rads)	Dose (mSv)
Total Body	5	0.05
Thyroid	15	0.15
Bone marrow	5	0.05
Bone (surface or internal)	15	0.15
Skin	50	0.50
Other organs or tissues	10	0.10

Exposures from the following types of sources of radiation shall be included:

- (1) Radiation from sources external to the body;
- (2) Radiation material that may be taken into the body from its occurrence in air or water;
- (3) Radiation material that may be taken into the body from its occurrence in food or on terrestrial surfaces; and
- (4) Radiation from sources internal to the body.

2. Section 140.85 is revised to read as follows:

§ 140.85 Criterion II—Substantial damages to persons offsite or property offsite.

After the Commission finds that an event has satisfied Criterion I, the Commission will determine that the event has resulted or will probably result in substantial damages to persons offsite or property offsite when any of the following conditions are satisfied:

- (a) A calculated collective dose of 100,000 person-rem (1,000 person-sieverts) has been delivered within a 50-mile radius during the course of the accident.
- (b) Offsite property having a value of \$2,500,000 is contaminated with radioactive materials in excess of the levels in § 140.84(b). The valuation shall be based on market value taking into account the ratio of assessed value/market value in each tax assessment jurisdiction.
- (c) Employment loss of at least 25,000 person-days has occurred.
- (d) Evacuation of at least 100,000 person-days has occurred as a result of an evacuation ordered by a State or local official with the authority to make such an order. For the purpose of this regulation, the evacuation ordered by a State or local official with the authority to make such an order. For the purpose of this regulation, the evacuation period will end when the evacuation order is rescinded by this or another responsible

official and when it is determined that the evacuated area may be reoccupied.

Option #3

1. In Subpart E of 10 CFR Part 140, § 140.84 is revised to read as follows:

§ 140.84 Criterion for an Extraordinary Nuclear Occurrence.

The Commission will determine that there has been a substantial release of radioactive material offsite, or that there have been substantial levels of radiation offsite such that substantial injuries or substantial damages have resulted or will probably result when radioactive material is released from its intended place of confinement and, as a result of the event, any of the following conditions is satisfied:

(a) Real and personal property is rendered unfit for its normal use as a result of contamination with radioactive materials at levels which produce gamma exposure rates at 1 meter above the surface equal to or greater than 10 millirads per hour, (0.1 milligray/hr).¹

(b) The integrated air dose which could be received by an individual, over any 24-hour period exceeds 10 rads (0.1 gray), or

(c) Real and personal property is rendered unfit for its normal use as a result of contamination for each square meter of any 100 square meters (as a minimum) at levels in excess of:

Transuranic Alpha-particle-emitting radionuclides.	0.25 microcuries per square meter (0.013 MBq/m ²). ¹
Non-transuranic alpha-particle-emitting radionuclides.	2.5 microcuries per square meter (0.13 MBq/m ²). ¹
Beta-gamma-emitting radionuclides.	4 millirads per hour (0.4 milligray/hr)@ 1 centimeter above the ground. ¹

¹Megebecquerel where 1 MBq = 10⁶ Bq and 1 becquerel (Bq) is 1 disintegration per second. A curie is 3.7 × 10¹⁰ Bq or 34,000 MBq.

²Measured to exclude very short-lived radionuclides (those having half-lives less than 1 hour) either by measurement at least 8 hours after the cessation of abnormal releases of radioactive materials or by making multiple measurements and compensating or correcting for the contributions from these short-lived radionuclides.

§ 140.85 [Removed]

2. Section 140.85 is removed.

Dated at Washington, DC this 2nd day of April 1985.

For the Nuclear Regulatory Commission.

John C. Hoyle,

Acting Secretary of the Commission.

[FR Doc. 85-8339 Filed 4-8-85; 8:45 am]

BILLING CODE 7550-01-05

¹Measured to exclude very short-lived radionuclides (those having half-lives less than 1 hour) either by measurement at least 8 hours after the cessation of abnormal releases of radioactive materials or by making multiple measurements and compensating or correcting for the contributions from these short-lived radionuclides.

NUCLEAR REGULATORY COMMISSION

10 CFR Part 140

RIN 3150-AB01

[Docket No. PRM-140-1]

Criteria for an Extraordinary Nuclear Occurrence;
Withdrawal of Proposed Rule and Denial of Petition for Rulemaking
Submitted by the Public Citizen Litigation Group and
Critical Mass Energy Project

AGENCY: Nuclear Regulatory Commission.

ACTION: Withdrawal of a proposed rule and denial of a petition for rulemaking.

SUMMARY: The Nuclear Regulatory Commission (NRC) is withdrawing a proposed rule that would have amended regulations concerning the criteria for an extraordinary nuclear occurrence (ENO) and is denying a petition for rulemaking (PRM-140-1) submitted by the Public Citizen Litigation Group and the Critical Mass Energy Project on this matter. This action is taken because the Commission has determined that the current criteria for determining that an ENO has occurred are adequate and are consistent with the intent of Congress, and that none of the options in the proposed rule is acceptable.

ADDRESSES: Copies of the petition for rulemaking, the public comments received, and the NRC's letters to the petitioners are available for public inspection or copying for a fee in the NRC Public Document Room, located at One White Flint North, 11555 Rockville Pike (first

~~floor), Rockville, Maryland. These documents are also available at the NRC's rulemaking website at <http://www.ruleform.llnl.gov>.~~

FOR FURTHER INFORMATION CONTACT: Harry S. Tovmassian, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, 301-415-3092 (email HST@NRC.GOV).

SUPPLEMENTARY INFORMATION

The Petition

By letter dated July 24, 1979, the Public Citizen Litigation Group and the Critical Mass Energy Project petitioned the NRC to take two actions pertaining to a determination whether events at nuclear reactors are ENOs within the meaning of 10 CFR 140.81. The petition was submitted on behalf of five individuals who were residents of Middletown, Pennsylvania, at the time of the March 28, 1979, accident at the Three Mile Island, Unit 2, nuclear reactor (TMI-2), and who claimed that they were harmed by that accident.

The petitioners' first request was that the NRC make a determination that the March 28, 1979, accident at TMI-2 was an ENO, within the meaning of 10 CFR 140.81. The NRC treated this portion of the petition as a response to its request for public comment on its July 23, 1979, *Federal Register* notice (44 FR 50419) of its decision to initiate "the making of a determination as to whether the recent accident at TMI-2 constitutes an extraordinary nuclear occurrence." On April 23, 1980 (45 FR 27593), the NRC published its finding that the accident at TMI-2 was not an ENO. That action constituted the Commission's denial of the petitioners' request for NRC to determine that the TMI-2 accident was an ENO.

The petitioners further requested that, regardless of its finding on the TMI-2 accident, the Commission alter or amend the criteria it uses for making a determination that an event is an ENO.

Basis for Request

If the Commission determines that a particular accident is an ENO, persons indemnified under the Price-Anderson Act (Section 170.n.1.) of the Atomic Energy Act of 1954, as amended (AEA), (42 U.S.C. 2210n(1)) waive certain legal defenses. Current NRC requirements in 10 CFR 140.81(b)(3) establish a two-part test for making a determination that an accident at a nuclear reactor or at a plutonium processing or fuel fabrication plant constitutes an ENO. This two-part test is specifically contemplated by Section 11.j. of the AEA. Section 11.j. defines an ENO as an event (1) causing an offsite discharge of certain radioactive material or offsite radiation levels that are deemed to be substantial and (2) that has resulted in, or probably will result in, substantial damages to persons or property offsite. Thus, applying the criteria specified in 10 CFR 140.84, the NRC first must find that a substantial offsite discharge of radioactive material has occurred or a substantial offsite radiation level has resulted. Second, the NRC must make a finding that substantial damages to persons or property offsite have been or probably will be incurred. If both findings are made, the Commission then must find that the event is an ENO.

With respect to their first request, the petitioners cite certain occurrences as the basis for their belief that the TMI-2 accident should be deemed an ENO: the evacuation of area residents with the concomitant harm to area businesses, large initial payments to victims, lawsuits filed, and radiological releases.

In support of their second request that the Commission change the criteria for making a determination that an event is an ENO, the petitioners state that the Joint Committee on Atomic Energy (JCAE) "established that the purpose of designating certain accidents as extraordinary nuclear occurrences is to distinguish a serious accident from an event in which nothing untoward or unusual occurred in the conduct of nuclear activities."¹ The petitioners assert that the NRC has the power and discretion to make the definition of an ENO responsive to the circumstances and needs of the public. Also, according to the petitioners, accidents of far less consequence than the one at TMI-2 could be designated as ENOs in conformity with the legislative intent of the Price-Anderson Act, as amended. The petitioners believe that it is appropriate and necessary that the criteria for the determination of an ENO be revised, altered, or amended to respond effectively to those circumstances and demonstrated needs.

Commission Response to Petition

On July 23, 1979 (44 FR 43128), the NRC published a notice in the *Federal Register* of its intent to make a determination as to whether the TMI-2 accident was an ENO. A notice of the filing of the petition from the Public Citizen Litigation Group and the Critical Mass Energy Project was published in the *Federal Register* on August 28, 1979 (44 FR 50419). The notice stated that the NRC intended to treat the petitioners' first request (to find the TMI-2 accident an ENO) as a response to its request for public comment on its July 1979 notice. The notice further stated that the petitioners' second request (to change the criteria for an ENO finding) would be treated as a petition for rulemaking. Both the July 1979 and the August 1979 notices invited interested persons to submit written comments or suggestions.

¹William B. Schultz, et al., Public Citizen Litigation Group and Critical Mass Energy Project, Petition for Rulemaking, July 24, 1979, p. 10.

Petitioners' First Request

The NRC considered comments on the petitioner's first request and in response to its July 1979 notice. For the reasons stated in its of April 23, 1980, *Federal Register* notice (45 FR 27590), the Commission determined that the March 28, 1979, accident at TMI-2 was not an ENO. Therefore, the petitioners' first request was denied.

Petitioners' Second Request

One comment was received on the second request, from an official of a nuclear utility. The commenter stated that the current criteria for determining that an accident was an ENO were consistent with the intent of Congress that the waiver of certain legal defenses triggered by an ENO determination be limited to incidents resulting in significant injury or loss. The commenter also stated that lowering the threshold for an ENO would lead to higher premiums for insurance coverage and could at some point endanger the availability of this coverage.

Although the Commission agreed with the commenter that the existing ENO criteria are consistent with the intent of Congress, it decided that these criteria should be reexamined because of difficulties in applying them after the TMI-2 accident. The primary difficulties cited stemmed from the fact that: (1) one criterion is based on "objective clinical evidence of radiation injury"; however, tests for evidence of such injury are not conclusive; and (2) monetary damages were difficult, if not impossible, to evaluate accurately in a timely manner (e.g., lower property values, business losses, evacuation costs). The Commission also cited a third difficulty with the existing ENO determination criteria that did not relate to problems encountered in the TMI-2 determination (i.e., the existing criteria are numerically inconsistent with the Environmental Protection Agencies (EPA) Protective Action Guidelines (PAG)).

~~Another factor that influenced the Commission's decision to reevaluate the ENO~~
determination criteria was that when Congress first enacted the waiver of defenses provisions of the Price-Anderson Act, as amended, the conventional belief was that an accident at a nuclear facility would be catastrophic with large releases of radioactive material in a short time. The accident at TMI-2 suggested that a more slowly developing accident could be catastrophic enough to be considered an ENO. Thus, the Commission decided that it would be worthwhile to examine whether the criteria it uses to determine whether an accident is an ENO adequately address a broad range of accident scenarios.

Proposed Rule

On April 9, 1985 (50 FR 13978), the Commission published proposed amendments to 10 CFR Part 140 that posed three options that were under consideration for revised criteria for making an ENO determination, and solicited public comment on these options. These options used estimates of offsite doses and ground contamination as indicators of "substantial releases." As to "substantial damages," the options avoided the measurement problems encountered in applying the present criteria by focusing on costs, which can be readily counted or estimated. The dose limits for "substantial releases" were set at values in the range of occupational dose limits but substantially above the doses to the general public expected from the normal operation of NRC-licensed facilities. Like the existing criteria, Options 1 and 2 had separate criteria for substantial discharges of radioactive material or substantial radiation levels offsite.

Option 1 would modify §140.84(a) to provide that a finding of a substantial discharge of radioactive material or substantial radiation level offsite should be based on a determination "that one or more persons offsite have been or probably will be exposed to radiation or

~~radioactive materials that would result in estimated doses" in excess of certain specified limits.~~

Option 2 had the same dose limits of Option 1 but specified that the finding must be that any of the doses "were or could have been received by a person or persons located on or near any site boundary throughout the duration of the accident."

Options 1 and 2 also differed with respect to the threshold for "substantial damage" to persons or property offsite. One of the thresholds in Option 1 replaced the existing "substantial damage" threshold of "objective clinical evidence of physical injury from exposure" with a dose-equivalent in the range that would produce symptoms of radiation sickness (i.e., 100 rads) in five or more exposed persons. Option 2 had neither the current "objective clinical evidence of physical injury" threshold nor the Option 1 threshold of a high dose to a few people. The Option 2 threshold was that a "calculated collective dose" (i.e., 100,000 person-rem) has been delivered within a 50-mile radius during the course of an accident. Both options replaced the present reference to the monetary value of property damage in Criterion II of the existing rule with effects that could be readily assessed within a relatively short period of time after an accident. Such effects include tax assessments, the number of people unemployed, and the number of people evacuated.

Option 3 departs from the two-part test required in the current criteria and the other options. Rather than requiring a Commission finding that the event resulted or probably would result in monetary damages exceeding certain thresholds, this option called for identifying conditions which had led or could lead to injury or damages. This option specified one set of criteria for substantial releases and levels of radiation offsite such that substantial injuries or substantial damages have resulted or will probably result. These criteria were expressed in terms of an integrated air dose that could be received by an individual over a 24-hour period in excess of 10 rads, or radioactive contamination levels offsite at which real and personal property are rendered unfit for normal use.

Public Comments on the Proposed Rule

The Commission received 27 letters commenting on the proposed rule. Although some commenters expressed their views about the merits of the various options proposed, there was no preponderance of support by the commenters for any of the options.

Ten commenters expressed an opinion on whether the criteria for making a determination that an ENO had occurred should be changed. Two commenters recommended changing the criteria. The Illinois Department of Nuclear Safety said that it did not believe that the two-pronged process of declaring a significant release and then determining that substantial damages were sustained was necessary and agreed with then-NRC Commissioner Bernthal's recommendation to use a single-criterion method. The commenter further stated that the existing process was complicated and time consuming and had inherent problems regarding accuracy and subjectivity but gave no rationale for these views. The Mississippi State Department of Health said that it favored Option 3 and that any of the options were more acceptable than the existing rule but did not give a basis for this view.

Eight commenters, representing approximately 21 separate entities,² recommended not changing the criteria. (Some commenters submitted the consolidated comments from other entities; other commenters endorsed these consolidated comments and submitted additional comments of their own.) The eight commenters stated that the existing ENO criteria were adequate and that no changes were required. Some commenters pointed out that the NRC's difficulties in applying the ENO criteria to the TMI-2 accident arose not from the criteria, but from the fact that the accident was not serious enough to meet the statutory requirements of

²For example, the Law Offices of Bishop, Lieberman, Cook, Purcell & Reynolds made comments on behalf of Boston Edison Co., Carolina Power & Light Co., Commonwealth Edison Co., Florida Power Corp., Middle South Services Inc., Ohio Edison Company, Pennsylvania Power & Light Co., Southern California Edison Co., and Virginia Electric & Power Co.

substantial offsite releases and substantial offsite damages. Some commenters also pointed out that no change in the regulatory criteria would relieve the Commission of the statutory obligation to determine whether both the offsite release and the offsite damages were substantial, even if such a determination proves to be difficult on occasion.

Several commenters who opposed changing the criteria stated that the NRC had not adequately justified reducing the threshold for a substantial release finding from 20 rem to 5 rem. They asserted that this reduction would increase the likelihood that an event would be declared an ENO.

Some commenters also questioned the NRC rationale for changing the criteria to be consistent with the EPA PAGs. According to the commenters, these guidelines are intended for emergency planning purposes and to protect the population at risk from the onset of release of radioactivity; they were not intended as baseline criteria for ENO determinations.

Some commenters who opposed changing the criteria stated that the reduction of the dose level to sustain a finding of a substantial offsite release of radioactivity to 5 rem was inconsistent with the intent of Congress, and that the proposed rule would permit the Commission to define as an ENO an event near the range of radiological exposures from anticipated occurrences and involving doses within or near permissible limits. One commenter quoted the authors of the "Joint Committee on Atomic Energy's Report (JAEC) Accompanying Bills to Amend Price-Anderson Act to Provide Immediate Financial Assistance to Claimants and to Require Waiver of Defenses:" "[T]here is no pressing need to invoke the mechanisms and procedures in situations which are not exceptional and which can well be taken care of by the traditional system of tort law."³

Another commenter gave the following opinion:

³Peter F. Riehm, KMC, Inc., September 6, 1985, p.2.

~~These proposed reductions would lower the existing dose levels~~

to values not much different from the current 10 CFR 20 limits.

We believe that these level reductions seriously lower the threshold of an ENO and that the original purpose may be somewhat diminished by the adoption of these reduced limits. In the original conception of 10 CFR 140, "Congress intended that the waiver of defenses be limited to incidents resulting in significant injury or loss" and that current ENO criteria should be consistent with this. It is possible that the seriousness or significance of an ENO may be lessened somewhat by these lower criteria.⁴

Another commenter expressed the same view:

The legislative history is clear that Congress, in amending the Atomic Energy Act to incorporate the ENO concept, wished to establish a threshold to prevent the waiver of defenses provision from applying in cases "where nothing untoward or unusual has occurred in the conduct of nuclear activities."⁵

Discussion

The Commission finds that the arguments for retaining the existing criteria are persuasive. The Commission intended to simplify the application of the ENO criteria, but is now

⁴Joseph F. Tiernan, Baltimore Gas and Electric, July 22, 1985, p.2.

⁵Bishop et al., August 7, 1985, p.2.

convinced by arguments of the public commenters that none of these options would accomplish this intent without undermining the purposes for which the ENO criteria were established.

In addition, section 11.j. of the AEA indicates that the dual criteria for findings of substantial releases and findings of substantial damages are to be used. Section 11.j. of the AEA has the following passage:

The term extraordinary nuclear occurrence means any event causing a discharge or dispersal of source, special nuclear, or byproduct material from its intended place of confinement in amounts off-site, or causing radiation levels off-site, which the Nuclear Regulatory Commission or the Secretary of Energy, as appropriate, determines to be substantial, *and* which the Nuclear Regulatory Commission or the Secretary of Energy, as appropriate, determines has resulted or will probably result in substantial damages to persons off-site or property off-site.
[emphasis added].

The Commission interprets this provision to mean that the determination that an ENO has occurred requires findings of substantial releases and of substantial damages.

Conclusions on Problems Cited in 1985 Federal Register Notice

With respect to the difficulties with the ENO determination criteria cited in the 1985 *Federal Register* notice (discussed earlier), the Commission now believes that these are not as serious as were once thought:

(1) ~~Experience gained as a result of the TMI-2 accident suggests that the Criterion II~~ threshold, requiring objective clinical evidence of radiation injury (10 CFR 140.85(a)(1)) to five or more individuals offsite, may not be as important to an ENO determination as the other findings in Criterion II. A second threshold in this criterion, a finding that \$5 million or more in damage offsite has been or probably will be sustained (10 CFR 140.85(a)(2)), would appear to trigger an ENO determination before the radiation injury finding would. After the TMI-2 accident, no deaths or injury due to the accident were reported. However, to date, more than \$70 million has been paid out in damages and expenses (mostly attributable to evacuation costs). If an accident occurred, the monetary damage estimate would apparently trigger the ENO determination before the death or injury threshold did. Thus the likelihood that the Commission would ever need to rely solely on 10 CFR 140.85(a)(1) to make a "substantial damages" to persons or property offsite finding is very small.

(2) The difficulty in estimating monetary damages does not seem to be as great as previously believed. The Commission now believes that timely and accurate estimates of monetary damages is possible. There exists a body of literature in which models for estimating such parameters and performing relevant studies are described. One study conducted by Mountain West Research, Inc., investigated the social and economic effects of the TMI-2 accident on the surrounding community.⁶ The Commission is confident that, should an event meriting an ENO determination occur again, experts from the relevant disciplines can be assembled to estimate monetary damages. Furthermore, the legislative history of the modifications to the "waiver of defenses" provisions of the Price-Anderson Act (where the ENO concept was introduced) indicates

⁶C.B. Flynn, J.A. Chalmers, "The Social and Economic Effects of the Accident at Three Mile Island," NUREG-CR-1215, January 1980.

~~that Congress was mindful that criteria to implement such an approach would be difficult~~
to apply. In its September 14, 1966, report accompanying House of Representatives Bill No. 17685,⁷ the former JCAE stated: "[T]he committee recognizes that inclusion of the 'extraordinary nuclear occurrence concept' in this bill adds very considerably to the complexity of implementing the proposed legislation."⁸ Thus, the difficulty of applying the criteria does not justify changing them.

- (3) The fact that existing ENO determination criteria are not numerically consistent with PAGs, which was cited in the *Federal Register* notice for the 1985 proposed rule, was not seen so much as a difficulty with applying ENO criteria to TMI-2, but, rather was seen as a perceived inadequacy of the ENO criteria. But the PAGs were established with different objectives than the ENO criteria. The purpose of the PAGs is to reduce the radiation exposure of the public by setting predetermined action levels for implementing planned protective actions, such as evacuations. These action levels are established with public health and safety as the main objective. "The concept of PAGs was introduced to radiological emergency response planning to assist public health and other governmental authorities in deciding how much of a radiation hazard in the environment constitutes a basis for initiating emergency protective actions."⁹ In contrast, as stated in 10 CFR 140.81(b), the ENO regulations set forth the criteria which the Commission will follow to determine whether there has been an ENO. The Commission has taken the position that health and safety regulations have been

⁷The Senate version of the bill, S-3830, was identical.

⁸House Report No. 2043, *supra*, n.1, p.11.

⁹"Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," NUREG-0396 (EPA 520/1-78-016), December 1978, p. 3.

~~conservatively determined and for a different purpose and are not appropriate for use as~~

ENO thresholds. Section 140.81(b)(1) sets forth the scope of the ENO criteria as follows:

The various limits in present NRC regulations are not appropriate for direct application in the determination of an "extraordinary nuclear occurrence" for they were arrived at with other purposes in mind, and those limits have been set at a level which is conservatively arrived at by incorporating a significant safety factor. Thus, a discharge or dispersal which exceeds the limits in NRC regulations, or in license conditions, although possible cause for concern, is not one which would be expected to cause substantial injury or damage unless it exceeds by some significant multiple the appropriate regulatory limit. Accordingly, in arriving at the values in the criteria to be deemed "substantial" it is more appropriate to adopt values separate from NRC health and safety regulations, and of course, the selection of these values will not in any way affect such regulations.

Thus, for the reasons stated, the Commission believes that lowering the thresholds for ENO determinations is not appropriate.

Summary of Commission Findings

The Commission has considered the comments in favor of modifying the criteria for determining that an ENO has occurred along the lines of the options presented in the proposed

rule and those comments in favor of retaining the existing criteria. The Commission finds the latter more persuasive. Specifically, the Commission finds that:

- (1) Although the existing criteria for determining that an ENO has occurred may be difficult to apply, they are consistent with the intent of Congress and need not be modified. The Commission believes that, contrary to the *Federal Register* notice for the proposed rule, the derivation of timely and accurate estimates of monetary damages is possible. The Commission is confident that, should an event meriting an ENO determination occur again, individuals and consulting firms with experience in estimating evacuation costs, changes in property values, loss of time from work, and other parameters can be assembled to make estimates of monetary damages. Moreover, as previously noted, the legislative history of the amendments to the "waiver of defenses" provisions of the Price-Anderson Act (where the ENO concept was introduced) indicates that Congress was mindful that criteria to implement such an approach would be difficult to apply. The difficulty of applying the criteria does not justify changing them.
- (2) None of the options offered by the Commission in the 1985 proposed rule satisfies the legislative intent of Congress in defining an ENO. Under Option 1, a "substantial release" is an exposure to one or more persons offsite. Option 2 specifies a "substantial release" as an exposure to one or more persons located on or near any site boundary during the accident. However, both options would lower the "substantial release thresholds" from a whole body dose of 20 rem to 5 rem and similarly lower individual organ thresholds. At that level, individuals would not normally experience symptoms of radiation sickness. Thus, if Option 1 or Option 2 were adopted, a "substantial release" determination could be made for releases unlikely to produce detectable radiation injuries offsite. The rationale for lowering of the dose limits from 20 rem to 5 rem (i.e., numerical consistency with EPA's PAGs) failed to consider the fact that the PAGs are

for initiating emergency response actions. The PAGs have no bearing on the dose levels at which the "waiver of defenses" provisions should be invoked. Therefore, the Commission finds that lowering "substantial releases" thresholds for ENO determinations is not warranted.

- (3) As noted previously, Option 3 differs from the existing criteria and the other two options. Option 3 relies upon the probability that substantial injury or damages will be the consequence of some threshold dose exposure rate or contamination level and eliminates the need to estimate actual or probable damages and injuries. For example, one of the thresholds in Option 3 is that if the integrated air dose to an individual over any 24-hour period exceeds 10 rads, the Commission would find that "substantial releases" and "substantial injuries" have probably resulted and declare the event an ENO, even if no injuries or damages are sustained or projected. In effect, this option uses a single criterion for "substantial release" and "substantial damage" and thus is inconsistent with the two-part test for ENO determinations defined in Section 11.j. of the AEA. Therefore, the Commission finds that Option 3 of the proposed rule is also not appropriate.

Commission Action

Several factors contributed to the delay in completing the resolution of this petition until this time. The Commission dealt with the central request of the petitioners (i.e., to declare the TMI-2 accident an ENO) in a timely fashion. The petition was received on July 25, 1979, and the NRC published its finding that the accident was not an ENO in the *Federal Register* on April 23, 1980. In announcing its finding, the Commission did not specifically deny the petitioners' request to declare the TMI-2 accident an ENO.

The other request of the petitioners, to modify the ENO determination criteria, was considered to be of secondary importance. The Commission decided to consider this proposal but accorded it a low priority because of resource considerations and the existence of higher priority rulemaking actions. In the meantime, in light of the public comments received, the Commission has reexamined its reasoning for the need for modification of the ENO criteria and the options that it proposed in the *Federal Register* notice for the proposed rule (50 FR 13978). The Commission also considered the legislative history of the Price-Anderson Act in arriving at its finding in this matter.

Because the current criteria for determining that an ENO has occurred are consistent with the intent of Congress and none of the options proposed in the 1985 rulemaking are deemed acceptable, the Commission now finds that revision of these criteria is not warranted. For these reasons, the second request in the petition for rulemaking (PRM-140-1) from the Public Citizen Litigation Group and the Critical Mass Energy Project is denied and the April 9, 1985, proposed rule is withdrawn.

Dated at Rockville, Maryland, this 16th day of October, 2000.

For the Nuclear Regulatory Commission.


Annette L. Vietti-Cook,
Secretary of the Commission.