

RULEMAKING ISSUE  
NOTATION VOTE

SECY-00-0160

July 26, 2000

FOR: The Commissioners  
FROM: William D. Travers  
Executive Director for Operations  
SUBJECT: WITHDRAWAL OF PROPOSED RULE AND DENIAL OF PETITION FOR RULEMAKING SUBMITTED BY THE PUBLIC  
CITIZEN LITIGATION GROUP AND THE CRITICAL MASS ENERGY PROJECT (WITS NO. W8100014)

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## PURPOSE:

To obtain Commission approval to publish in the *Federal Register* a notice of denial of the petition for rulemaking (PRM-140-1) submitted by the Public Citizen Litigation Group and the Critical Mass Energy Project and withdrawal of proposed amendments to [10 CFR Part 140](#).

## BACKGROUND:

After the March 28, 1979, accident at Three Mile Island, Unit 2 (TMI-2), several activities related to the compensation of persons who incurred damages as a result of the accident were set into motion. One of these activities was a decision by the Commission to make a determination whether the accident was an "extraordinary nuclear occurrence" (ENO) as defined in Section 11.j. of the Atomic Energy Act of 1954, as amended. A notice of this decision was published in the *Federal Register* on July 23, 1979 (44 FR [EXIT](#) 43128). Should the Commission make a finding that an accident is an ENO, persons indemnified under the Price-Anderson Act (Atomic Energy Act, Section 170.n.) waive certain legal defenses, relieving the claimant of having to prove negligence by a defendant and of having to disprove defenses such as contributory negligence.

On July 24, 1979, the Public Citizen Litigation Group and the Critical Mass Energy Project petitioned the Nuclear Regulatory Commission (NRC) to take two actions relating to an ENO determination at nuclear power plants. The petition for rulemaking was submitted on behalf of five residents of Middletown, Pennsylvania at the time of the accident at TMI-2 who stated that they were harmed by the accident. The petitioners requested the Commission to: (1) find that the accident at TMI-2 was an ENO; and (2) alter or amend the criteria it uses for making a determination that an event is an ENO. A notice of receipt of the petition and request for public comment was published in the *Federal Register* on August 28, 1979 (44 FR 50419).

Since the Commission was in the process of making an ENO finding on the TMI-2 accident when this petition was received, it treated the first request as a comment on the July 23, 1979, notice in the *Federal Register*. On April 23, 1980 (45 FR 27590), the NRC published its finding in the *Federal Register* that the accident at TMI-2 was not an ENO. That action constituted the Commission's denial of the request to determine the accident to be an ENO; however, the *Federal Register* notice did not specifically deny the first part of the petitioners' request. The Commission stated that there were difficulties encountered in applying the existing ENO criteria to the TMI-2 accident. The difficulties were due, in part, to the unusual nature of the accident (i.e., severe onsite consequences resulting in relatively small offsite releases of radiation). According to the Commission, one could envision an accident even more severe than TMI-2 in terms of onsite damage, resulting in widespread evacuation and related losses, yet minor in terms of actual radiological consequences.

With respect to the second request in the petition, the Commission received one public comment on the matter of the amendment of the ENO criteria. The commenter stated that the current criteria for an ENO determination were consistent with the intent of Congress and that the waiver of certain legal defenses triggered by an ENO determination should be limited to incidents resulting in significant injury or loss. The commenter also believes 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.

## DISCUSSION:

The term "extraordinary nuclear occurrence" is defined in Section 11.j. of the Atomic Energy Act as:

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 probably will

result in substantial damages to persons off-site or property off-site.

This provision calls for a two-part test. In order to make an ENO determination, the Commission must first find that there has been a substantial discharge or dispersal of radioactive material offsite or that there have been substantial levels of radiation offsite, as specified in 10 CFR 140.84. If the Commission so finds it must then find that the event has resulted or will probably result in substantial damages to persons offsite or property offsite, as specified in 10 CFR 140.85.

When Congress enacted the "waiver of defenses" provisions of the Price-Anderson Act, as amended, it was believed that an accident at a nuclear facility would be catastrophic with large releases of radioactive material in a short period of time. Such an accident would cause personal exposures and contamination of property meeting Criterion I, rather than an accident of long duration, causing anxiety, some evacuations, but not "substantial" effects in radiological terms.

In the TMI-2 matter, the Commission concluded that the accident did not satisfy the substantial release criterion. There was considerable difficulty in attempting to apply Criterion II, "substantial damages," to the TMI-2 accident. Therefore, the Commission determined that it would be worthwhile to examine whether the criteria it uses to determine if an accident is an ENO, based on the problems pointed out by the facts of TMI-2, are appropriate.

Accordingly, on April 9, 1985 (50 FR 13978) the Commission announced its intention to partially grant the subject petition and published proposed amendments to 10 CFR Part 140. The Commission proposed three options containing differing criteria for determining that an ENO had occurred and solicited public comment on these options. Although the Commission stated that it believed the existing ENO criteria are consistent with the Atomic Energy Act definition, it proposed that these criteria should be reexamined because of difficulties encountered in applying them to the TMI-2 accident. According to the Commission there were three problems with the existing ENO criteria: 1) inconsistency of the existing criteria with the lower dose thresholds in the Environmental Protection Agency's (EPA **EXIT**) "Protective Action Guides" (PAG) on which several of the dose thresholds for "substantial releases" are based; 2) the lack of conclusive tests for objective clinical evidence of radiation injury (Criterion II, "substantial injury"), partly because of the similarity between some physical symptoms of psychological stress and acute radiation injury; and 3) the difficulty, if not the impossibility, of accurately and timely evaluation of monetary damages (Criterion II), some of which required court adjudication in the TMI-2 case for award of proper compensation.

Options 1 and 2 retain the structure of the existing criteria (i.e., sequential substantial release/damage determinations) 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. Option 1 and Option 2 would both lower the threshold for a determination of a substantial release of radioactive material or radiation offsite from the current projected whole body dose in excess of 20 rem to 5 rem. These reduced dose limits for substantial release determinations were set at values in the range of occupational dose limits but are substantially above the doses to the general public expected from the normal operation of NRC-licensed facilities. The third option proposed a single set of three conditions, any one of which, if met, would be sufficient for a finding of both substantial releases and substantial damages.

The Commission received 27 comments on the proposed rule, with no preponderance of support for any one of the options. A number of commenters believed that the existing criteria for determining that an ENO had occurred were adequate and presented convincing arguments supporting this view. One commenter said that the difficulties in applying the criteria after the TMI-2 accident were a result of the lack of "substantial releases" and "substantial damages" and not the inadequacy of the ENO criteria. Two commenters favored modifying the ENO criteria, arguing that the proposed options would be easier to apply.

After considering the public comments on the proposed rule, the Staff has found the arguments for retaining the existing criteria the most persuasive. Furthermore, the Staff believes that each of the options proposed has serious deficiencies. Options 1 and 2 would set one of the thresholds for a "substantial release" determination at a projected whole body dose in excess of 5 rem, which could trigger an ENO determination at levels near the allowable occupational doses. However, the legislative history of the Price-Anderson Act indicates that it was Congress' intention that the waiver of defenses be invoked only if something exceptional were to happen. Since Option 3 proposes a single criterion for both substantial releases and substantial damages, it strays from Congressional intent for a sequential substantial release/substantial damage determination. The legislative history indicates that Congress did not intend that a "substantial release" determination alone would trigger the waiver of defenses provisions of the Price-Anderson Act.<sup>(1)</sup> Should Option 3 be adopted, an integrated air dose exceeding 10 rads which could be received by an individual over a 24 hour time period would trigger an ENO determination, even if no injuries or damages were sustained.

With respect to the difficulties with the ENO determination criteria cited in the 1985 *Federal Register* notice, the Staff now believes that these are not as serious as was once thought:

- (1) The first difficulty cited was not the difficulty of applying the ENO criteria to TMI-2, but a perceived inadequacy in the ENO criteria because they were not in line with the EPA's PAGs. However, the PAGs were established for a completely different set of objectives than those for the ENO determination criteria. The PAGs have been established with the intention of reducing the exposure of the public by providing predetermined action levels for implementation of 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.<sup>(2)</sup> In contrast, the ENO criteria were established to provide thresholds for triggering the waiver of defenses provisions for persons indemnified under the Price-Anderson Act. The Commission has already taken the position that health and safety regulations have been arrived at conservatively and for a different

purpose and are not appropriate for use as ENO thresholds. Paragraph (b)(1) of Section 140.81 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, the Staff believes that lowering the ENO determination thresholds for substantial releases, as proposed in Options 1 and 2, is not appropriate.

- (2) 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 thresholds in Criterion II. A second threshold in this criterion, a finding that \$5 million or more 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 criterion 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 another accident occurred, the monetary damage estimate would apparently trigger an ENO determination before the death or injury threshold did.
- (3) The difficulty of estimating monetary damages does not seem to be as great as previously believed. The legislative history that led to the amendments to the "waiver of defenses" provisions of the Price-Anderson Act, in which the ENO concept was introduced, indicates 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, <sup>(3)</sup> the former Joint Committee on Atomic Energy (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."<sup>(4)</sup> Thus, the difficulty of applying the criteria is not an appropriate justification for changing them. Furthermore, the Staff now believes that timely and accurate estimates of monetary damages are possible. Several studies describe models estimating such damages.<sup>(5)</sup> The Staff is confident that, should an event meriting an ENO determination occur again, experts from relevant disciplines can be assembled to estimate monetary damages.

## **CONCLUSION:**

The Staff has concluded that the proposed amendments to 10 CFR Part 140 should be withdrawn and the petition denied. In the Staff's view, the existing criteria are adequate, the difficulties in applying the criteria cited in the 1985 *Federal Register* notice are overstated, and there are serious deficiencies in each of the options posed in the proposed rule.

## **TIMELINESS OF COMMISSION RESPONSE:**

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 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 comment received, the Staff 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 Staff has also relied upon its own analysis of the legislative history of the Price-Anderson Act in arriving at its recommendations to the Commission.

## **COORDINATION:**

The Office of the General Counsel has reviewed this paper and has no legal objection. The Office of the Chief Financial Officer concurs that there will be no resource impacts. The Office of the Chief Information Officer has reviewed this paper for information technology and management implications and concurs in it.

## **RECOMMENDATION:**

That the Commission

1. Approve the *Federal Register* notice that denies the petition and withdraws the proposed rule ([Attachment 1](#)).
2. Note
  - a. That the staff will contact both petitioners after the Commission approves this action but before it is released for the purpose of informing the petitioners of the NRC's official response to the petition ([Attachment 2](#)) and providing any additional explanation that the petitioners may request, and
  - b. That the staff recommends the Commission inform Congress.

*/RA/*

William D. Travers  
Executive Director for Operations

CONTACT: Harry Tovmassian NRR/DRIP/RGEB  
(301) 415-3092

Attachments: 1. [Federal Register Notice](#)  
2. [Letters to Petitioners](#)

ATTACHMENT 1

[7590-01-P]

**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 are 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, 2120 L Street, NW. (Lower Level), Washington, DC.

Copies of NUREGS may be purchased from the Superintendent of Documents, U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7082. Copies are also available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. A copy is also available for inspection and/or copying at the NRC Public Document Room, 2120 L Street, NW (Lower Level), Washington, DC.

**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](mailto:HST@NRC.GOV)).

## SUPPLEMENTARY INFORMATION

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## 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 constitutes 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 statutorily required<sup>(6)</sup> by Section 11.j. of the AEA, that defines an ENO as an event in which offsite radiation levels are deemed to be substantial and damages to persons or property have resulted, or probably will result, in substantial damage offsite. Thus, the NRC must first find that a substantial discharge of radioactive material or a substantial radiation level offsite has occurred, applying the criteria specified in 10 CFR 140.84. Second, if this finding is made, the NRC must then make a finding whether substantial damages to persons or property offsite have been or probably will be incurred, applying the criteria specified in 10 CFR 140.85. If this finding is also made, the Commission must then 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."<sup>(7)</sup> 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.

## 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 is 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 slow 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 modified §140.84(a) to define a substantial discharge of radioactive material or substantial radiation level offsite as based on finding "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 the 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 is that a "calculated collective dose" (i.e., 100,000 person-rem) has been delivered within a 50-mile radius during the course of the accident as evidence that substantial damages to persons or property offsite have been sustained. 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 Department of Nuclear Safety of the State of Illinois 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,<sup>(8)</sup> 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 because the accident was not serious enough to meet the statutory requirements of substantial offsite releases and substantial offsite damages. Some commenters also pointed out that no change in the regulatory criteria can 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 for determining that an ENO had occurred stated that the reduction of the dose level for 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."<sup>(9)</sup>

Another commenter gave the following opinion:

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.<sup>(10)</sup>

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."<sup>(11)</sup>

## 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 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, the AEA (42 USC Sec. 2014) states 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 a determination of substantial damages should only be made if a prior finding of substantial releases has been made.<sup>(12)</sup>

## 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 legislative history of the modifications 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. In its September 14, 1966, report accompanying House of Representatives Bill No. 17685,<sup>(13)</sup> 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."<sup>(14)</sup> Thus, the difficulty of applying the criteria does not justify changing them. Furthermore, 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.<sup>(15)</sup> 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.
- (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, is not a difficulty with applying ENO criteria to TMI-2, but is a perceived inadequacy in the ENO criteria. 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."<sup>(16)</sup> 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 ENO. The Commission has taken the position that health and safety regulations have been conservatively arrived at 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. 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. Furthermore, the Commission believes that, contrary to the *Federal Register* notice for the proposed rule, the making 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.
- (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.

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 Section 11.j. of the AEA.<sup>(17)</sup> 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 \_\_\_\_ day of \_\_\_\_\_, 2000.

For the Nuclear Regulatory Commission.

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

ATTACHMENT 2

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

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.

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,

William D. Travers  
Executive Director for Operations

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

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Ms. Wanonah Hauter, Director  
Critical Mass Energy Project  
215 Pennsylvania Avenue, SE  
Washington, DC 20003

Dear Ms Hauter:

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.

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Sincerely,

William D. Travers  
Executive Director for Operations

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

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1. See House Report No.2043, "Amendments to the Price-Anderson Indemnity Provisions of the Atomic Energy Act of 1954, as Amended, Pertaining to Waiver of Defenses," HR 17685, September 14,1966, p. 23, where the Joint Committee on Atomic Energy stated that the definition of "extraordinary nuclear occurrence" entails a two-tiered test.

2. 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.

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

4. House Report No. 2043, supra, p.11.

5. Examples of such studies include: (1) C.B. Flynn, "Three Mile Island Telephone Survey," NUREG/CR-1093, October 1979; (2) C.B. Flynn and J.A. Chalmers, "The Social and Economic Effects of the Accident at Three Mile Island," NUREG/CR-1215, November 1979; (3) H.B. Gamble and R.H. Downing, "Effects of the Accident at Three Mile Island on the Residential Property Values and Sales," NUREG/CR-2063, April 1981; and (4) J. J. Tawil, et al., "Off-Site Consequences of Radiological Accidents," NUREG/CR-3413, August 1985.

6. In 1985, the Commission published a proposed rule (50 FR 13978) on an ENO criteria option that contained a single set of thresholds for substantial release and substantial damage. The Commission now believes that Congress intended that a sequential substantial release/substantial damage finding be made to eliminate the possibility of an ENO finding when there has been substantial release but no substantial damage.

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

8. For 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.

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

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

11. Bishop et al., August 7, 1985, p.2.

12. See House Report No. 2043, "Amendments to the Price-Anderson Indemnity Provisions of the Atomic Energy Act of 1954, as Amended, Pertaining to Waiver of Defenses," HR 17685, September 14, 1966, p. 23, where the JCAE stated that the definition of "extraordinary nuclear occurrence" entails a two-tiered test.

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

14. House Report No. 2043, supra, n.1, p.11.

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

16. "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.

17. Id., p. 23. The JCAE, in its section-by-section analysis of HR 17685, stated: "The Commission will determine what is 'substantial' in a particular case in accordance with the criteria . . . which have been developed in advance of the event. . . . In addition, the Commission must determine whether the event has resulted or will probably result in 'substantial damages' to persons or property offsite." [emphasis added].