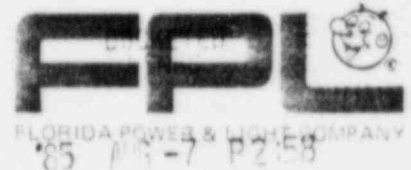


EXHIBIT NUMBER
PROPOSED RULE **PR-140** (10)
(50 FR 13978)

P. O. BOX 029311 MIAMI, FLORIDA 33102

August 7, 1985



Mr. Samuel J. Chilk
Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Proposed Amendments to 10 CFR §§140.84 and 140.85
(50 Fed. Reg. 13978 (1985)).

Dear Mr. Chilk:

On April 9, 1985, the Nuclear Regulatory Commission ("NRC") published in the Federal Register a Notice of Proposed Rulemaking entitled "Criteria for an Extraordinary Nuclear Occurrence" (the "Notice"). The Notice proposes changes to the criteria defining "substantial discharge" and "substantial damages," which are used in determining whether a nuclear incident is an "extraordinary nuclear occurrence" (ENO); these changes would revise 10 CFR §§140.84 and 140.85. The Notice also invited comments on the proposed changes. In response to that invitation, FPL respectfully submits the comments which follow.

I. BACKGROUND ON FPL

FPL is an investor owned utility providing electric service throughout a large portion of Florida. In 1984, it had an investment of approximately \$8 billion in utility operations with operating income of approximately \$550 million. FPL owns and operates four nuclear power generating units. Because of

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its substantial involvement in nuclear power, FPL is vitally interested in the NRC's criteria defining ENOs.

II. COMMENTS

FPL shares the concern expressed by the NRC that the existing ENO criteria may be difficult to apply and that delays in determining whether an ENO exists could work to the detriment of everyone involved in a nuclear incident. Accordingly, FPL applauds the NRC's attempt in this rulemaking to clarify the ENO criteria. In general, FPL finds what the NRC has identified as Option 1 to be the most desirable proposal, although it also sees merit in the approach which Commissioner Bernthal has suggested as Option 3. However, FPL believes that there are problems with each of those options which the NRC should rectify if it decides to revise the existing criteria. Each of the three options is discussed below.

A. Option 1

As indicated above, FPL believes that Option 1 may be the most workable of the three proposed in the Notice. However, there are several details in Option 1 which require comment.

1. Measuring offsite exposure (proposed §140.84(a))

The existing wording of §140.84(a) requires the NRC to consider radiation doses received by persons off site who "were, could have been, or might be exposed to radiation or to radioactive material" in determining whether a "substantial discharge" has occurred. This wording makes the determination unrealistically theoretical. Option 1 proposes to replace that wording with the phrase "has been or probably will be exposed to radiation or radioactive materials." FPL supports this change because it would substantially reduce the uncertainty involved in making the "substantial discharge" determination.

Of particular importance is the proposed elimination of the phrase "could have been." With a "could have been" standard, one presumably must include the most heavily contaminated off site locations, even if it is extremely improbable that anyone was there throughout the period of exposure following the discharge. This ignores the existence and purpose of evacuation plans; the whole point of such plans is to exclude people from or limit their stays in highly contaminated areas following a nuclear incident.

FPL also strongly supports the proposal in Option 1 to replace "might be" with "probably will be." This change would make it clear that a realistic assessment of future exposure is

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to be used in determining if a "substantial discharge" has occurred rather than a worst case analysis. Again, a worst case analysis would ignore the efforts of emergency workers to restrict people from entering highly contaminated areas.

While the proposed revision to the language of §140.84(a) is extremely helpful, FPL suggests that one additional change be made to recognize another problem with the existing wording. Neither the current wording nor the proposed revision distinguishes between emergency workers and the general populace. Option 1 proposes to tie the "substantial discharge" criterion to exposure levels set at the upper limit of EPA Protective Action Guides. FPL supports this approach as to the general populace. However, the NRC has failed to recognize an important distinction in those guides: they allow exposure limits that are considerably higher for emergency workers (e.g., 25 rems vs. 5 rems for whole body exposure). The higher exposures are necessary in order to implement the sheltering and/or evacuation plans which help to ensure that the general populace will not receive exposures in excess of the EPA guidelines.

The NRC should not rely on the unusually high exposure of emergency workers in concluding that a "substantially discharge" has occurred, when the general populace might have received only insignificant exposures. Accordingly, FPL suggests that the NRC change the phrase in proposed §140.84(a)

which reads "one or more of the persons offsite" to "one or more of the persons offsite, other than emergency workers,...."

2. Table 1 dose levels (proposed §140.84(a))

In addition to revising the language that describes how radiation exposure must be measured, Option 1 also revises the values in Table 1 to which those measurements are to be compared. The Notice states that the proposed values are representative of the upper end of the EPA's Protective Action Guides. 50 Fed. Reg. at 13980. FPL agrees that the upper limit of the Guides should be used. This change would fit well with the approach currently used in emergency planning for nuclear facilities. Sheltering and evacuation are employed to help limit exposure of the populace to levels within the Protective Action Guides range. Thus, exposure of the general public to levels exceeding that range would indicate a "substantial discharge."

However, it appears that there are two of the values appearing in the revised Table 1 which are lower than the upper limit of the Guides, and which therefore should be revised upward. The upper limit specified in June 1980 by the EPA for the thyroid is 25 rems,^{1/} whereas the value proposed in Table

^{1/} EPA-520/1-75-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (rev. June 1980).

1 is only 15 rems.^{2/} Similarly, the value for "other organs or tissues" is specified as 10 rems in Table 1, whereas the EPA recommends that a 5 rems whole body dose equivalent be used instead.^{3/} If determining the whole body dose equivalent is too complex, FPL recommends using a 15 rems dose for "other organs or tissues," consistent with NCRP 43^{4/} and ICRP 15.^{5/}

3. Quantitative standard for physical injury
(proposed §140.85(a))

Currently, §140.85(a)(1) contains a qualitative standard for assessing whether physical injuries constitute

^{2/} The Food and Drug Administration ("FDA") Protective Action Guide for thyroid exposure due to ingestion of contaminated food is 15 rems, as the NRC has proposed. See 47 Fed. Reg. 47073 (October 22, 1982). However, ingestion of contaminated food is easier to control and, in any event, is a much less likely pathway of exposure than the direct exposure to which the EPA's 25 rems limit relates. FPL recommends that the EPA value be used because it is representative of a more likely scenario or, at the least, that the EPA and FDA limiting values be differentiated to distinguish the pathway to which they apply.

^{3/} The EPA, in September 27, 1983 draft revisions to Chapters 2 and 5 of EPA-520/1-75-001, recommends that exposure of "other organs or tissues" be used as a weighted component of the whole body dose equivalent.

^{4/} National Council on Radiation Protection and Measurements, Report No. 43, Review of the Current State of Radiation Protection Philosophy (March 1, 1982).

^{5/} International Commission on Radiological Protection, Report No. 15, Protection Against Ionizing Radiation from External Sources (November, 1969).

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substantial damages: it requires the NRC to determine whether "objective clinical evidence of physical injury" exists. Option 1 would replace that standard with a more quantitative one: exposure of five or more people to a radiation dose equivalent of 100 rads.

FPL supports this approach because it would reduce the subjectivity of the existing standard. Of particular significance is the ambiguity inherent in interpreting the term "physical injury." There is considerable dispute within the medical community over what constitutes physical injury from radiation exposure and how to measure it. This lack of consensus would necessarily put the NRC at a great disadvantage in trying to apply the existing standard.

While the test proposed in Option 1 effectively addresses the uncertainty inherent in the existing "objective clinical evidence" test, it has been rightly criticized by Commissioner Bernthal in the Notice for being too inflexible. 50 Fed. Reg. at 13983. The principal problem stems from the high threshold level chosen (100 rads) and the requirement that five people exceed that threshold. Accordingly, FPL proposes that the test be revised to require that one or more persons other than an emergency worker receive during the course of the nuclear incident a whole body radiation dose equivalent that is greater than some value between 50 and 75 rems. FPL has no

strong position about what the value should be in the 50-75 rems range. The reasons for FPL's proposed revision are:

- 100 rads is too high as a threshold limit. As stated in NCRP 39,^{6/} exposure to more than 75 rads is likely to produce symptoms requiring hospitalization.
- Exposure to 50-75 rads is about as low as can be detected by conventional laboratory means such as blood cell changes. FPL believes laboratory tests would be the principal means of detection because it is unlikely that exposed individuals other than emergency workers would have been wearing dosimeters during their exposure.
- Exposure to less than 50-75 rads is also unlikely to result in acute radiation symptoms and would require minimal, if any, medical care. Consistent with the current philosophy of looking to "death or hospitalization" (§140.85(a)(1)), the threshold

^{6/} National Council on Radiation Protection and Measurements, Report No. 39, Basic Radiation Protection Criteria (January 15, 1971).

exposure level should coincide with the level at which acute symptoms and hospitalization would probably be required.

- A whole body dose equivalent expressed in rems rather than rads should be used, as this would take into account the different biological risks associated with different types of radiation. FPL also recommends that the NRC review its ENO criteria generally to reduce the inconsistency in usage of rems and rads as units of radiation exposure; a discussion of the circumstances under which each is appropriate would be helpful.
- Emergency workers should not be considered in determining whether an ENO exists. They might have to be exposed to high levels of radiation to accomplish important safety-related objectives, and their actions should not be influenced by the ENO determination.

4. Property damage standard (proposed §140.85(a)(2))

Option 1 would replace the current requirements of \$2.5 million of damage to one person's property or \$5 million of

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total damage with a standard which looks only to the value of the property contaminated. This is not consistent with the Atomic Energy Act. While it may be difficult to determine the amount of property damage, looking only at the value of the property ignores entirely the direction in the Act that an ENO must involve substantial damages to persons or property off site. See Atomic Energy Act of 1954, §11(j), 42 U.S.C. §2014(j).

Taken to its logical extreme, a piece of undeveloped property worth \$2.5 million could be contaminated with short-lived radioactivity that either quickly decays to insignificant levels or can be cleaned up at minimal cost. The economic consequences of the contamination would be minimal, yet it would still constitute "substantial damages" under the Option 1 proposal. FPL urges the NRC to reject this part of the proposal and retain the existing property damage tests of §140.85(a)(2) and (3).

5. Employment loss and evacuation standards (proposed §140.85(c) and (d))

Option 1 also would count lost employment time (§140.85(c)) and evacuation time (§140.85(d)) as "substantial damages." FPL agrees with Commissioner Bernthal's observation in the Notice that both subsections (c) and (d) could create undesirable and counterproductive incentives. 50 Fed.Reg. at

13983. The number of days of lost employment or evacuation time would be largely a function of decisions made by employers and governmental authorities in the area surrounding the site of a nuclear incident. One can envision political or other pressures leading those persons to increase the number of days of employment loss or evacuation time slightly in order to exceed the thresholds established. Id. FPL sees no benefit and considerable potential for detriment in defining "substantial damages" so that incentives of this sort are created.

6. Other comments on Option 1

Finally, two brief comments regarding Option 1 should be noted. First, Option 1 includes a proposed §140.84(a)(4) that defines one of the four locations for measuring exposure to radiation as "radiation from sources internal to the body." There is no equivalent provision in the current §140.84, and FPL is unaware of the NRC's reasoning for including the new provision. Subsections (a)(2) and (a)(3) of §140.84 cover the pathways and sources of internal radiation exposure with which FPL is familiar; accordingly, FPL questions whether the proposed subsection (a)(4) is needed. FPL also notes that the word "radiation" has been used in proposed subsections (a)(2) and (a)(3) where it appears the word "radioactive" should appear, as it does in the existing subsections (a)(2) and (a)(3).

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Secondly, the NRC has used the term "accident" rather than "incident" in proposed §140.85(a) of Option 1. This is not consistent with past NRC terminology, and FPL recommends that it be eliminated. Similar references appear in proposed §§140.84(a) and 140.85(a) of Option 2.

B. Option 2

While FPL understands the concerns which Commissioner Asselstine is attempting to address in his Option 2 proposal, FPL recommends that the NRC not adopt it. There are two differences between Option 1 and Option 2 which are especially significant and which make Option 2 less desirable. These are the use of the phrase "were or could have been" to describe the radiation doses received by the off site populace during a nuclear incident (§140.84(a)) and the collective dose standard used in defining "substantial damages" (§140.85(a)).

1. Measuring offsite exposure (proposed §140.84(a))

In Option 1, the NRC has proposed to eliminate some of the uncertainty concerning the determination of radiation exposure to the off site populace by revising the current wording of "were, could have been, or might be exposed" to "has

been or probably will be exposed." As discussed above, FPL believes that this revision would represent a substantial improvement. In Option 2, however, the proposed change is to the phrase "were or could have been received." This retains the speculative uncertainty as to past exposure inherent in the phrase "could have been." Trying to predict where people could have been exposed and at what levels necessarily leads to a worst case analysis that ignores the impact of emergency planning efforts. The wording proposed in Option 1 is superior and should be adopted.

2. Collective dose standard (proposal §140.85(a))

Option 2 also differs from Option 1 in its proposed criterion for personal injury. Commissioner Asselstine indicates that his "collective dose" approach is intended to reflect the "findings that the latent effects of a serious nuclear accident could far outweigh the observable acute effects." 50 Fed. Reg. at 13981. FPL urges the Commission not to involve the definition of "substantial damages" in the debate over what causes and constitutes "latent effects." The uncertainty concerning this subject is so great that there is practically no exposure level the NRC could pick for which there

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would be general agreement that exposure below that level did not lead to "latent effects."

The "collective exposure" approach should be rejected for practical reasons as well. The calculated collective dose will be dramatically dependent on the number of people living near a facility. If a facility is located in a high density area, collective dose levels in the range proposed by Commissioner Asselstine could be exceeded with ridiculously low individual exposures. For example, if one million people lived within the 50 mile radius proposed by Commissioner Asselstine, an average exposure to only .1 rem would yield a collective exposure of 100,000 person-rem. In contrast, the average annual dose to an individual of the U.S. population from exposure to natural background radiation is on the order of 0.1 rem.^{7/} Thus it is feasible under Option 2 for one million people to receive a dose of the same amount as received from natural background radiation and yet nonetheless qualify as having been "substantially damaged." In addition, the NRC has set a standard of .5 rem as the allowable yearly off-site exposure to an individual from normal operations. 10 CFR 20.105(a).

^{7/} National Academy of Sciences, Committee on the Biological Effects of Ionizing Radiations, The Effects On Populations of Exposure To Low Levels Of Ionizing Radiation (1980).

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The foregoing example is hardly extreme. Even in relatively low density areas, the collective exposure adds up quickly. FPL's St. Lucie nuclear plant is situated on a barrier island with few large population centers nearby. Nevertheless, during the peak season, the population (permanent plus transient) is about 135,000 within just a 10 mile radius of that plant. Exposure of this population to an average of less than .8 rem would exceed Commissioner Asselstine's standard.

The "collective exposure" approach is misguided and simply unworkable. FPL urges the Commission not to adopt it.

C. Option 3

FPL sees merit in Commissioner Bernthal's proposal to combine the "substantial discharge" and "substantial damages" criteria. It would avoid the political pressures which would inevitably descend upon the NRC once it made a determination that a "substantial discharge" had occurred. Under those circumstances, FPL suspects that the NRC would be hard pressed not to conclude that there had also been "substantial damages." This would be particularly true if, as is almost inevitable, the "substantial damages" tests involve an element of subjectivity. However, notwithstanding the appeal of this unified approach,

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FPL believes there are at least two flaws in Option 3 that would have to be addressed if it were selected.

1. Property damage standard (proposed §140.84(a))

First, the standard for property damage in proposed §140.84(a) is unrelated to the level of actual economic loss experienced. This problem is similar to that discussed earlier with respect to Option 1. While subsection (a) requires that property be rendered unfit for its normal use, it says nothing about how much property has to be involved or about the economic consequences thereof. In the extreme case, this condition would be satisfied by contamination that left one square meter of property temporarily unfit for some low-level usage. The economic consequences of that contamination would be trivial. Moreover, the test fails to account for the possibility that property might be cheaply decontaminated to acceptable levels. For these reasons, FPL believes that §140.84(a) of Option 3 is simply unworkable, and suggests that the NRC retain a standard which looks to the actual damages suffered by property owners, such as existing §140.85(a)(2) and (3).

2. Radiation dose level (proposed §140.84(b))

The second major concern about Option 3 is the low level of the radiation dose used to define substantial personal injury in §140.84(b). Receiving a dose of 10 rads certainly qualifies as significant exposure, but FPL does not believe that it would create a high probability of physical injury. Commissioner Bernthal seems to admit as much in his comments in the Notice. He defends the 10 rad level as a dose that "can be considered substantial since it is twice the value that triggers protective action as established by the FDA and the EPA." 50 Fed. Reg. at 13964 (emphasis added). The test for ENOs is not whether a radiation dose is "substantial," but whether there have been substantial damages as a result of the exposure. FPL is also unaware of anything which correlates exposure to twice the EPA Protective Action Guide levels with a conclusion that the exposed person has been physically injured.

If the unified approach of Option 3 is to be realistic, the radiation exposure level chosen must reflect a reasonable probability of substantial damages. The radiation exposure standard which FPL proposed above would be appropriate. That proposal requires that one or more persons other than an emergency worker receive during the course of a nuclear incident

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a whole body radiation dose equivalent that is greater than some value between 50 and 75 rems.

III. CONCLUSIONS/RECOMMENDATIONS

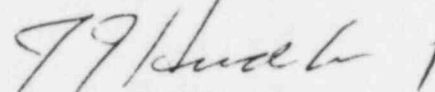
FPL applauds the NRC's attempt to refine the ENO criteria. If the NRC concludes that one of the three options proposed in its Notice of Proposed Rulemaking should be adopted, FPL recommends that Option 1 be chosen. However, if Option 1 is adopted, it should be revised to reflect the concerns FPL has expressed herein.

If the NRC believes that combining the "substantial discharge" and "substantial damages" criteria into one is desirable, FPL recommends that Option 3 be revised to reflect property damage and personal injury tests which more realistically represent a risk of substantial damages. The tests proposed in Option 3 could be met with little, if any, risk of substantial damages. A personal injury test similar to that FPL has proposed in its discussion of §140.85(a) under Option 1 and a property damage test similar to the existing §140.85(a)(2) and (3) would be appropriate.

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FPL respectfully requests the NRC to consider and reflect the foregoing recommendations in any revisions to the ENO rule which it decides to adopt.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "J. J. Hudiburg", followed by a vertical line.

J. J. Hudiburg
President