

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

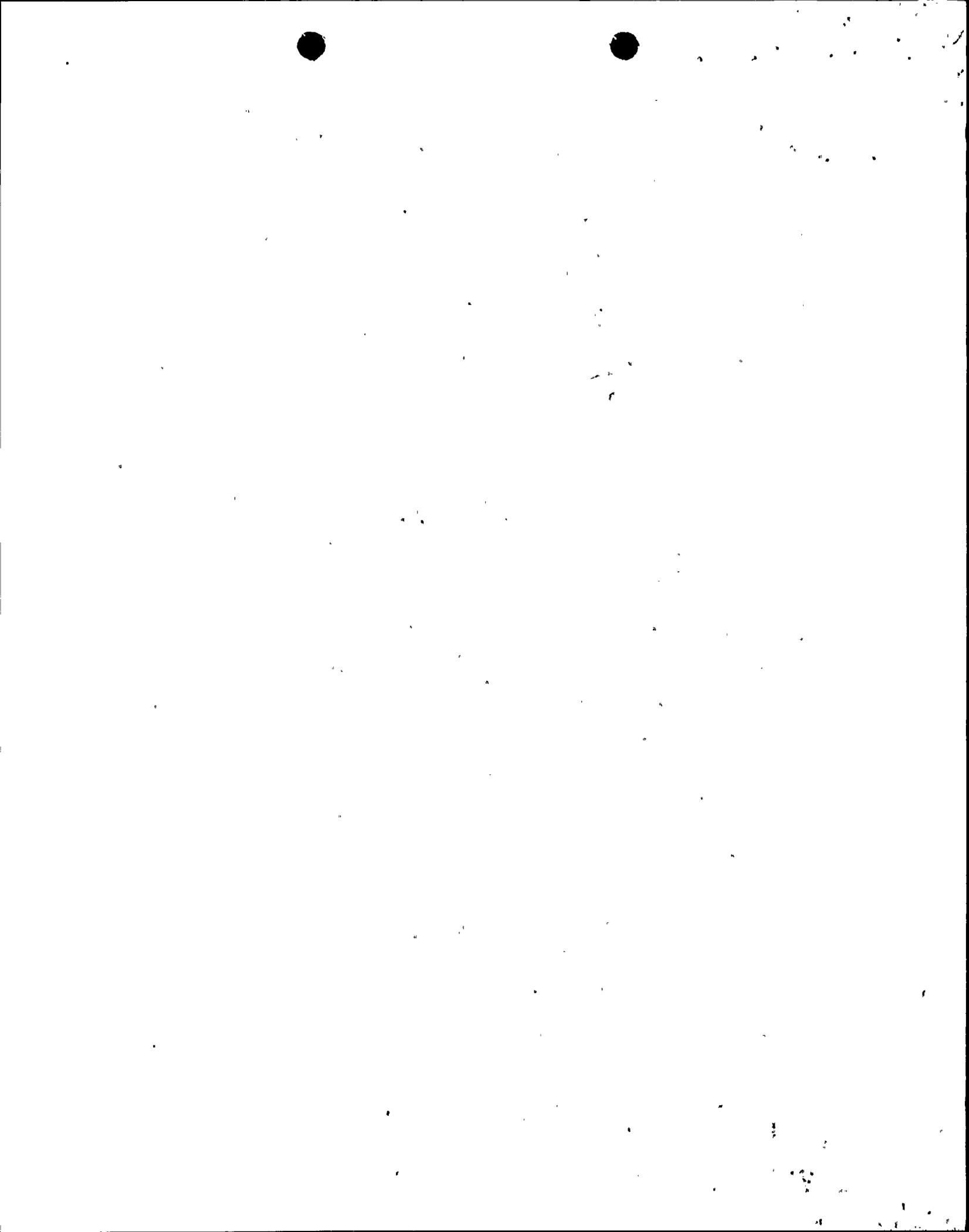
OFFICE OF NUCLEAR REACTOR REGULATION  
Harold R. Denton, Director

In the Matter of	)	
	)	
FLORIDA POWER & LIGHT COMPANY	)	Docket No. 50-389
(St. Lucie Nuclear Power Plant,	)	(10 CFR 2.206)
Unit 2)	)	

DIRECTOR'S DECISION UNDER 10 CFR 2.206

On February 14, 1980, the Atomic Safety and Licensing Appeal Board referred a motion to the Director of Nuclear Reactor Regulation for consideration under 10 CFR 2.206. The motion, filed by Martin H. Hodder and Terence J. Anderson on behalf of the intervenors in the St. Lucie Unit 2 construction permit proceeding, asked the Appeal Board to include consideration of "Class 9" accidents at the St. Lucie facility with the remaining matters in the proceeding. The request was based on the Commission's decision in Offshore Power Systems,<sup>1/</sup> which the petitioners construed as changing the Commission's general policy against considering the consequences of Class 9 accidents in individual licensing proceedings. Except for two issues which the Appeal Board found unrelated to the environmental consequences of Class 9 accidents, the construction permit proceeding had been concluded before this

<sup>1/</sup> Offshore Power Systems (Floating Nuclear Power Plants), CLI-79-9, 10 NRC 257 (1979).



agency and the federal courts.<sup>2/</sup> The Appeal Board dismissed, therefore, the petitioners' motion for want of jurisdiction and referred the motion to the Director of NRR for consideration as a petition under 10 CFR 2.206.<sup>3/</sup>

When the petitioners filed their motion with the Appeal Board on December 12, 1979, the Commission's policy on consideration of "Class 9" accidents was in a state of flux. The term "Class 9" accident had been used by the Commission in a proposed rule which would have added an Annex to Appendix D of 10 CFR Part 50 to establish the manner in which various categories of accidents should be taken into account in the environmental review for a nuclear power plant.<sup>4/</sup> The "Class 9" category, which included the most serious accidents, was generally not required to be analyzed in environmental reports and statements under the proposed Annex. The proposed Annex was adopted as interim guidance until the Commission took further action to finally adopt or reject the Annex.

<sup>2/</sup> The Licensing Board had authorized issuance of the permit to construct St. Lucie Unit 2 in 1977, an action that the Appeal Board later approved. LBP-77-27, 5 NRC 1038, aff'd, ALAB-435, 6 NRC 541 (1977), as modified by Appeal Board Order of October 28, 1977. The Commission declined to review the Appeal Board's decision, thereby making it the final action of this agency. The decision was upheld on judicial review. Hodder v. NRC, 589 F.2d 1115 (D.C. Cir. 1978) (decision without published opinion), cert. denied, 444 U.S. 829, rehearing denied, 444 U.S. 974 (1979). The District of Columbia Circuit's unpublished memorandum is reproduced at 13 Environ. Rep. (BNA) 11 (1978). The intervenors' unsuccessful appeal was based in part on the NRC's refusal to consider Class 9 accidents at the St. Lucie site.

<sup>3/</sup> ALAB-579, 11 NRC 223 (1980).

<sup>4/</sup> Consideration of Accidents in Implementation of the National Environmental Policy Act of 1969, 36 Fed. Reg. 22851 (1971).

In September 1979, the Commission issued a decision in Offshore Power Systems in which it announced its intention to complete the rulemaking begun by the Annex and to reexamine the Commission's policy on accident considerations.<sup>5/</sup> The Commission asked the NRC staff to provide recommendations on changes to the Annex's guidance and to identify individual cases in which the staff believed the environmental consequences of Class 9 accidents should be considered.<sup>6/</sup> The petitioners here, relying on the Offshore Power Systems decision, asked the Appeal Board to take several actions in response to the petitioners' motion. These actions are summarized in the petitioners' answer to the NRC staff's and the licensee's replies to the petitioners' original motion:

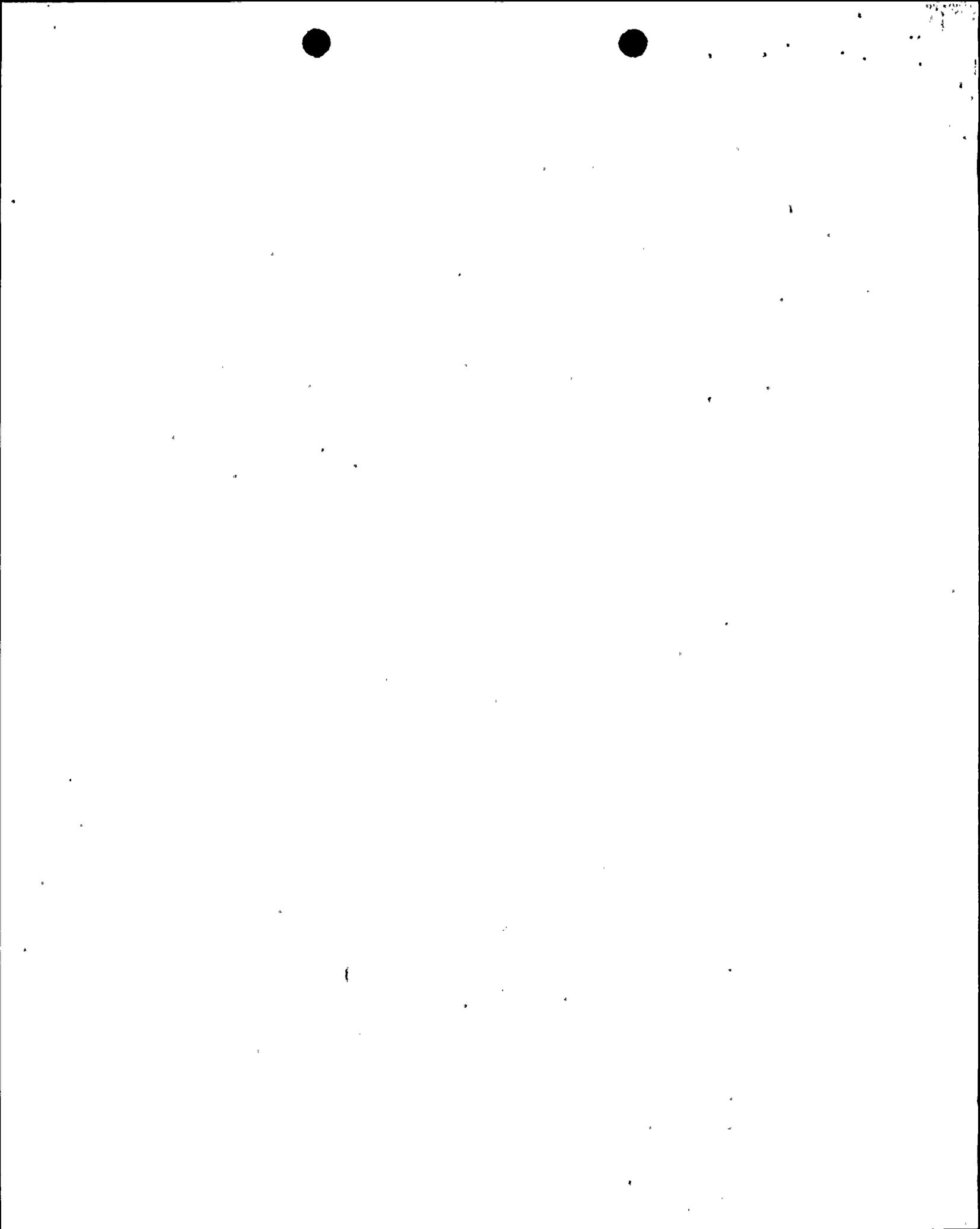
"[I]ntervenors submit that the Appeal Board should enter an order:

1. staying completion of these proceedings until the Commission has received and acted upon the staff's recommendations with respect to class 9 accident consideration at the St. Lucie site or has adopted a new general policy;
2. directing the staff to advise the Commission within 30 days of the reasons why it believes the consequences of class 9 accidents should or should not be considered in this case and granting the other parties 30 days after that advice is given to submit their views on the question to the Commission; and
3. certifying to the Commission as major and novel the question of the standards to be applied by the staff in determining in which 'individual cases...the environmental consequences of Class 9 accidents should be considered', the procedures by which such staff determinations are to be reviewed, and how the Commission's order in Offshore is to be implemented."<sup>7/</sup>

<sup>5/</sup> CLI-79-9, 10 NRC 257, 262 (1979).

<sup>6/</sup> Id. at 262.

<sup>7/</sup> Intervenor's Reply to FPL's and the NRC Staff Response at 18-19.



The Appeal Board effectively disposed of the petitioners' request to stay further proceedings when it declined jurisdiction over the matters raised in the motion. The Appeal Board saw no direct link between the Class 9 issue and the two pending matters in the St. Lucie proceeding and, therefore, the Appeal Board found that it could not accede to the petitioners' request to take up the Class 9 issue. In the absence of some direct relationship between the Class 9 issue and the issues which remained for disposition in the proceeding, the Class 9 issue could not be reintroduced into the proceeding, and it would be inappropriate as well as beyond the Appeal Board's jurisdiction to stay the remaining proceedings until the Class 9 issue had been resolved.

The issue left for resolution in this decision under 10 CFR 2.206 is whether any action should be taken to reopen at this time the Class 9 issue with respect to St. Lucie Unit 2. Since the petitioners filed their motion before the Appeal Board, the Commission has announced a revised interim policy on accident considerations in environmental reviews.<sup>9/</sup> In its new interim guidance the Commission withdrew the proposed Annex and provided guidance on accident considerations in NEPA reviews in licensing proceedings where a final environmental statement has not been issued. Under the Commission's new guidance, environmental impact statements for on-going and future NEPA reviews will give consideration to a broader spectrum of accidents, including severe accidents that may have been designated "Class 9" under the Annex. The Commission gave the following guidance:

9/ Nuclear Power Plant Accident Considerations under the National Environmental Policy Act of 1969, 45 Fed. Reg. 40101 (June 13, 1980).

"In the analysis and discussion of such risks, approximately equal attention shall be given to the probability of occurrence of releases and to the probability of occurrence of the environmental consequences of those releases....

"Events or accident sequences that lead to releases shall include but not be limited to those that can be expected to occur. In-plant accident sequences that can lead to a spectrum of releases shall be discussed and shall include sequences that can result in inadequate cooling of reactor fuel and to melting of the reactor core."10/

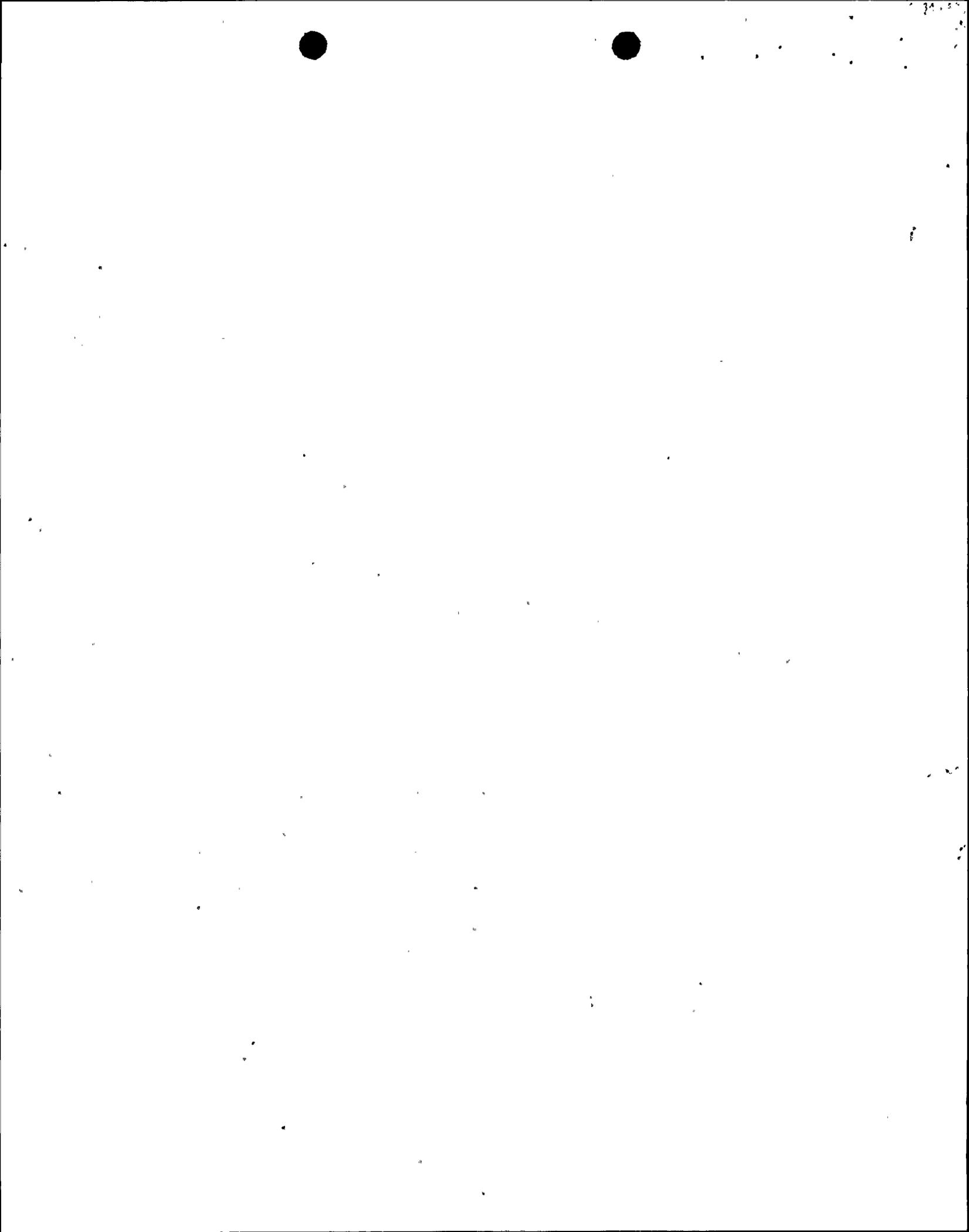
Because no final environmental statement (FES) has been issued in connection with the operating license for St. Lucie Unit 2, the St. Lucie FES will be subject to the Commission's new interim policy which requires more extensive analysis of severe accidents.

In addition to its guidance with respect to future NEPA reviews, the Commission also provided guidance with respect to facilities for which final environmental statements had been issued, including facilities like St. Lucie Unit 2 which have construction permits, but which await review for operating licenses:

"It is expected that these revised treatments will lead to conclusions regarding the environmental risks of accidents similar to those that would be reached by a continuation of current practices, particularly for cases involving special circumstances where Class 9 risks have been considered by the staff....Thus, this change in policy is not to be construed as any lack of confidence in conclusions regarding the environmental risks of accidents expressed in any previously issued Statements, nor, absent a showing of similar special circumstances, as a basis for opening, reopening or expanding any previous or on-going proceeding.5/

"However, it is also the intent of the Commission that the staff take steps to identify additional cases that might warrant early consideration of either additional features or other actions to

10/ 45 Fed. Reg. at 40103.

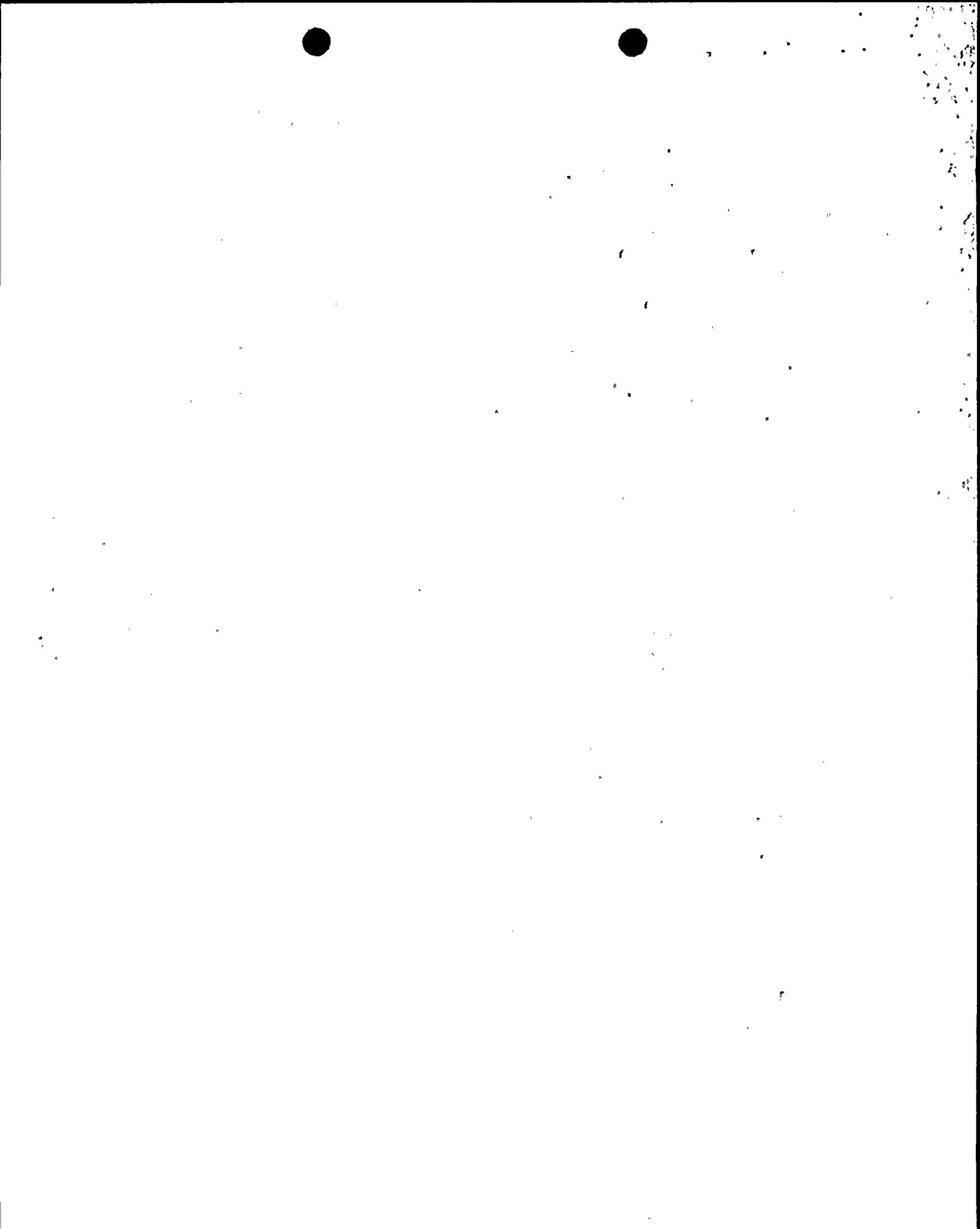


prevent or to mitigate the consequences of serious accidents. Cases for such consideration are those for which a Final Environmental Statement has already been issued at the Construction Permit stage but for which the Operating License review stage has not yet reached. In carrying out this directive, the staff should consider relevant site features, including population density, associated with accident risk in comparison to such features at presently operating plants. Staff should also consider the likelihood that substantive changes in plant design features which may compensate further for adverse site features may be more easily incorporated in plants when construction has not yet progressed very far.

"5/ Commissioners Gilinsky and Bradford disagree with the inclusion of the preceding two sentences. They feel that they are absolutely inconsistent with an evenhanded reappraisal of the former, erroneous position on Class 9 accidents"11/

Mindful of the Commission's directives, the Staff has reviewed information concerning the St. Lucie facility to determine whether special circumstances exist that might warrant consideration of Class 9 accidents at this time or that might warrant early consideration of additional features or actions to prevent or mitigate the consequences of serious accidents. As the Commission noted in the new statement of interim policy, the staff has identified in the past special circumstances which would warrant more extensive consideration of Class 9 accidents. The special circumstances fell within three categories: (1) high population density around the proposed site, i.e., above the trip points in the Standard Review Plan (NUREG 74-087, Sept. 1975) and Regulatory Guide 4.7, General Site Suitability Criteria for Nuclear Power Stations (Nov. 1974); (2) a novel reactor design (a type of power reactor other than a light water reactor); or (3) a combination of a

11/ 45 Fed. Reg. at 40103.



unique design and a unique siting mode.<sup>12/</sup> In Public Service Company of Oklahoma, which was decided before the Commission stated its new interim policy, the Commission listed, in addition to these three criteria, proximity of a plant to a "man-made or natural hazard" as "the type of exceptional case that might warrant additional consideration."<sup>13/</sup> These, then, are the criteria that guide the Staff's determination as to whether there are "special circumstances" which would warrant "opening, reopening, or expanding any previous or on-going proceeding" with respect to Class 9 accident considerations for St. Lucie Unit 2.<sup>14/</sup> The Staff has applied these criteria to the St. Lucie facility, and, on the basis of this review, I have determined that "special circumstances" do not exist which would

<sup>12/</sup> See 45 Fed. Reg. at 40102; Public Service Electric & Gas Co. (Salem Nuclear Generating Station, Unit 2), DD-80-17, 11 NRC 596, 615 n.21 (Apr. 1980). In the first category fell the Perryman site, for which the staff performed an informal assessment in the early site review of the relative differences in Class 9 accident consequences among the alternative sites. The Clinch River Breeder Reactor, a liquid metal cooled fast breeder reactor which is different from the more conventional light water reactor, fell within the category of novel reactor design, and the staff included a discussion in the final environmental statement (NUREG-0139, Feb. 1977) of its consideration of Class 9 accidents. The floating nuclear power plants represented the third category of special circumstances, a combination of unique design and a unique siting mode. Because the plants would be mounted on a floating barge, there would be no soil structure to retard the release and dispersal of activity beneath the plant following a core melt accident as would be the case for land-based plants. The staff concluded that the most likely potential exposure to the population from the liquid pathway for a floating nuclear plant would be significantly greater than for a land-based plant.

<sup>13/</sup> CLI-80-8, 11 NRC 433, 434 (Mar. 1980).

<sup>14/</sup> These criteria have been applied in three other decisions under 10 CFR 2.206, one of which was decided after the Commission's announcement of its new interim policy. Arizona Public Service Co. (Palo Verde Nuclear Generating Station, Units 1, 2 & 3) et al., DD-80-22, 11 NRC 919 (June 1980); Public Service Electric & Gas Co. (Salem Nuclear Generating Station, Unit 2), DD-80-17, 11 NRC 596 (Apr. 1980); Public Service Co. of New Hampshire (Seabrook Station, Units 1 & 2), DD-80-6, 11 NRC 371 (Feb. 1980).

warrant special consideration for St. Lucie Unit 2 at this time of Class 9 accidents or additional design features or actions to compensate for site features in the prevention or mitigation of the consequences of severe accidents. The results of the Staff's review follow.

As described in Section 4 of the Staff's Safety Evaluation Report (Nov. 7, 1974) and in Section 1.2 of the Preliminary Safety Analysis Report, the nuclear steam supply system for Unit 2 is a Combustion Engineering pressurized water reactor using a two-loop coolant system. The reactor design is basically similar to the design of several other Combustion Engineering reactors, including St. Lucie Unit 1 (in operation since 1976) and Calvert Cliffs Units 1 and 2 (in operation since 1974 and 1976, respectively). The St. Lucie Unit 2 is, therefore, a typical light water reactor facility, and does not involve a novel design.

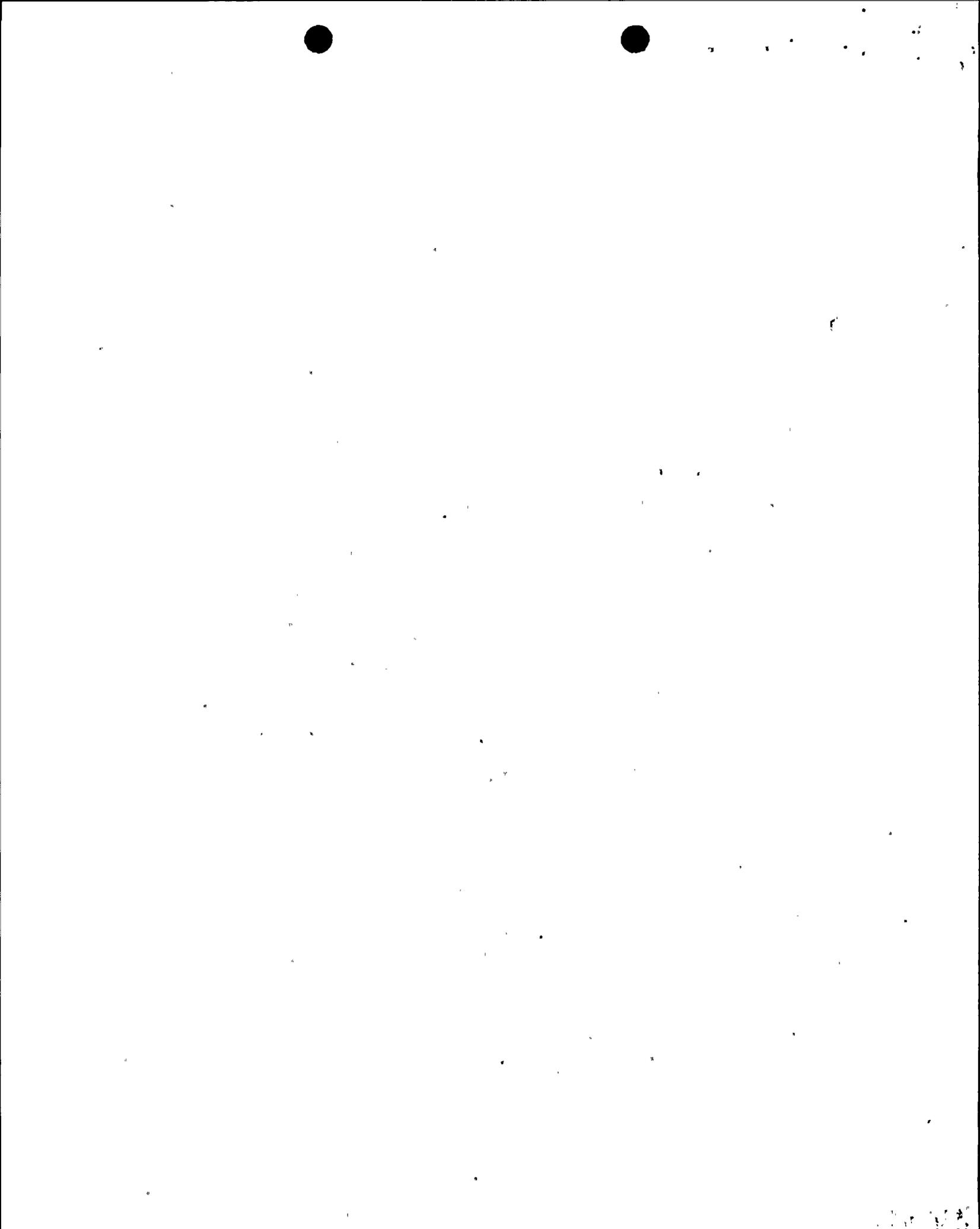
The St. Lucie Unit 2 is located on Hutchinson Island, a Florida coastal barrier island which lies between the Atlantic Ocean and a long bay called Indian River. The nearest surface water body which would be affected by liquid releases from a Class 9 accident is Big Mud Creek, an inlet of Indian River. The water table at the site is at an elevation of 2 feet mean sea level (MSL). The gradient is approximately 0.0024 toward Big Mud Creek. Groundwater velocity is conservatively estimated to be less than 10 feet per day.

If a Class 9 accident were to occur, the groundwater in the plant area would be first affected. Contaminated liquids generated by a postulated core-melt accident would first encounter the compacted fill which extends 30 feet below the reactor building. Because the reactor building is about

850 feet from Big Mud Creek, travel time of contaminants in the groundwater would be at least two and one-half months. Due to the slow rate of groundwater movement, the Staff concludes that there are no unusual features or special circumstances with regard to the characteristics of groundwater contamination and its interdiction at this site that would distinguish the site from other land-based light water reactor sites such that special consideration of environmental consequences of Class 9 accidents would be warranted.

The NRC's task action plan (Task III.D.2:3) includes an in-depth study of liquid pathway radiological control, one of the potential special concerns in assessing consequences of severe accidents.<sup>15/</sup> St. Lucie Unit 2 and all other plants will be evaluated as part of this task. If the evaluation should result in the liquid pathway being identified as a unique consideration for St. Lucie, methods of interdiction and mitigation will be identified. Based on the Liquid Pathway Generic Study (NUREG-0440, Feb. 1978) and preliminary discussions with Argonne National Laboratory on liquid pathway mitigation methods, the Staff believes it is possible to interdict releases within the time period identified above and thereby reduce or prevent the migration of contaminated groundwater to the river. Several methods of mitigation, including pumping and construction of slurry walls to prevent migration, are available. If site specific features are required for St. Lucie, they will be identified as part of the review of liquid pathway radiological control.

<sup>15/</sup> NRC Action Plan Developed as a Result of the TMI-2 Accident, Vol. I, at III.D.2-4 (NUREG-0660, May 1980).



The Staff has also reviewed information on man-made or natural hazards that might potentially impair safety-related features of the St. Lucie facility. As described in the Safety Evaluation Report (section 2.2), there are no military, transportation, or industrial facilities near the site which pose unusual hazards to safe operation. Site location and station design have been found acceptable with respect to such man-made hazards. The Staff's review specifically ensures that station design is adequate to accommodate natural as well as man-made characteristics of the site's environs.<sup>16/</sup> The Staff has not identified any unusual circumstances with respect to such external hazards that would warrant reopening a proceeding on St. Lucie or additional consideration now of additional design features.

The Staff has developed population density guidelines, which are given in Regulatory Guide 4.7, for determining when the population surrounding a proposed new site is sufficiently high to require that special attention be given to the consideration of alternative sites with lower population densities. A proposed site which exceeds the population density guidelines of Reg. Guide 4.7 can nevertheless be selected and approved by the staff if, on

<sup>16/</sup> Meteorological, hydrological, geologic, and seismic characteristics of the site are discussed in the Staff's safety evaluation for St. Lucie Unit 2, which was issued in November 1974 and was supplemented on March 3 and April 27, 1976. The impact of hurricanes received extensive attention at the construction permit proceeding, and the applicant was required to provide certain protection against erosion that might occur as a result of a postulated design basis stalled hurricane. See Florida Power & Light Co. (St. Lucie Nuclear Power Plant, Unit 2), LBP-75-5, Partial Initial Decision - Environmental and Site Suitability, 1 NRC 101, 120-15, 134-41 (1975); LBP-17-27, Initial Decision, 5 NRC 1038, 1053-56, 1079 (1977). See also Supplement No. 1 to the Safety Evaluation of the St Lucie Plant Unit No. 2, § 2 (March 1976).

balance, it offers advantages compared with available alternative sites when all of the environmental, safety, and economic aspects of the proposed site and the alternative sites are considered. The Staff believes that the comparison of the population distribution between a proposed site and candidate alternative sites constitutes a reasonable approach to an assessment of the relative differences in the environmental consequences for a spectrum of severe accidents, including Class 9 events. However, the Staff recognizes that the population density of a site is a relatively crude measure of the residual risk associated with accidental releases of radioactivity. The risk from any accidental releases would depend not only upon the population density of a site, but also upon many other factors that would enter into the determination of the actual consequences of an accident. In addition, insight gained from staff studies of accident risk leads the staff to conclude that the risk is not uniform for all members of the public regardless of distance from the site, but would be higher for those persons relatively close to the site, and generally decreases with distance away from the site.

The following table shows the cumulative population and population density out to a radius of thirty miles around the St. Lucie #2 site for the years 1970, 1983, and 2030. The 1970 population was based on census data, while the 1983 and 2030 projections were developed by the applicant.<sup>17/</sup>

17/ Final Safety Analysis Report for St. Lucie Unit 2 (March 1980).

POPULATION DISTRIBUTION  
ST. LUCIE SITE

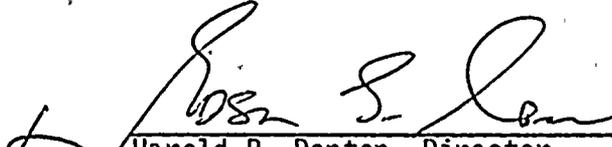
<u>RADIUS</u>	<u>CUMULATIVE POPULATION</u>			<u>POPULATION DENSITY, PERSONS/MI<sup>2</sup></u>		
	<u>1970</u>	<u>1983</u>	<u>2030</u>	<u>1970</u>	<u>1983</u>	<u>2030</u>
<u>Miles</u>						
0 - 5	4040	12616	21084	52	160	268
0 - 10	46040	85950	158851	147	274	506
0 - 20	76040	150034	277405	61	120	221
0 - 30	121040	229879	424450	43	81	150

As shown in the table above, the cumulative population density surrounding the St. Lucie #2 site at the proposed start-up date is estimated to be less than the 500 persons per square mile density guideline of Reg. Guide 4.7 out to a distance of 30 miles. The projected growth rate for the area surrounding the site indicates that the population density will stay well within the 1,000 persons per square mile guideline over the lifetime of the plant. Based upon the foregoing findings and considerations, the Staff concludes that the population data for the St. Lucie site do not reflect a sufficiently unique circumstance in and of themselves, or when the data is compared to much higher populations at some other power plant sites, to warrant special consideration at this time of Class 9 accident consequences or additional preventive or mitigating design features and actions.

In light of the Staff's review, I have determined that no special actions are required now with respect to severe accident considerations for the St. Lucie Unit 2 facility. Accordingly, the motion referred to me for consideration under 10 CFR 2.206 is denied. I reiterate, however, that the final environmental statement for the St. Lucie Unit 2 operating license

will include the analysis of severe accidents required under the Commission's new interim policy. In addition, the Staff will require mitigating measures for St. Lucie Unit 2 if such measures are found necessary as a result of the generic study on the liquid pathway.

A copy of this decision will be filed with the Secretary for the Commission's review in accordance with 10 CFR 2.206(c). As provided in 10 CFR 2.206(c), this decision will constitute the final action of the Commission 20 days after its issuance, unless the Commission on its own motion initiates review of this decision within that time.

  
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Harold R. Denton, Director  
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland  
this 28<sup>th</sup> day of November, 1980.