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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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Before the Atomic Safety and Licensing Board

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

In the Matter of)	
)	
LONG ISLAND LIGHTING COMPANY)	Docket No. 50-322 (OL)
)	
(Shoreham Nuclear Power Station,)	
Unit 1))	

LILCO Brief on the Applicability
of the Single Failure Criterion
to the EDG Load Contention

On December 28, 1984, Judge Brenner notified LILCO and Suffolk County of the Board's decision concerning the admissibility of the joint Suffolk County and New York State EDG load contention. Section (a)(iv) of the contention admitted by the Board was as follows:

Contrary to the requirements of 10 CFR Part 50, Appendix A, General Design Criterion 17 -- Electric Power Systems, the emergency diesel generators at Shoreham ("EDGs") with a maximum "qualified load" of 3300 KW do not provide sufficient capacity and capability to assure that the requirements of clauses (1) and (2) of the first paragraph of GDC 17 will be met, in that

- (a) LILCO's proposed "qualified load" of 3300 KW is the maximum load at which the EDG may be operated, but is inadequate to handle the maximum load that may be imposed on the EDGs because:

...

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(iv) operators may erroneously start additional equipment;

Among other reasons, LILCO objected to this portion of the contention because it went beyond the single failure criterion of the NRC's regulations. LILCO's Response to Joint Motion to Admit EDG Load Contention, at 11 (December 27, 1984). While the Board has admitted this issue for the time being, it has also permitted LILCO to file a brief explaining in more detail why this part of the EDG contention is impermissible. Accordingly, in this brief, LILCO demonstrates that

- (i) section (a)(iv) of EDG contention alleges multiple failures beyond the single failure criterion,
- (ii) the NRC's regulations prohibit the admission of such an issue absent special circumstances, and
- (iii) Intervenors have alleged no special circumstances adequate to justify admission of the contention.

I. EDG Contention Section (a)(iv)
Alleges Multiple Independent Failures

EDG load contention section (a)(iv), though susceptible of two interpretations,^{1/} alleges, in effect, that multiple

^{1/} As originally proposed by Intervenors, this portion of the contention could have been construed to mean that the operator error is the single independent failure to be considered under the single failure criterion. If so construed, however, there is nothing to litigate because the diesels are undeniably designed to accommodate single failures. In the event of a LOOP/LOCA, all three diesels would be available to mitigate the

(footnote continued)

independent failures must be considered in analyzing the reliability of the Shoreham diesel generators. More importantly, the thrust of this portion of the Intervenors' contention is that the system for the supply of emergency power to Shoreham must be designed to withstand failures beyond the single failure criterion. Thus, according to Intervenors, GDC 17 requires that the system be designed so that adequate emergency power is available even assuming a LOOP/LOCA event, the single failure of a diesel, and then, in addition, an operator error which should be assumed to fail a second diesel.^{2/} For the reasons stated below, absent a showing of exceptional

(footnote continued)

event. Even if an operator error inadvertently overloaded a diesel resulting in its loss, the remaining two diesels would be sufficient to supply emergency power to the plant. As the Board has noted, and the County has not disputed,

Even in the event of a design basis accident at 100% power and maximum core fission inventory, only two out of three diesels are required for safe shutdown. However, it is required by the NRC's "single failure criterion" that there be three operable diesels in the event of a failure of one of them upon demand.

Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), LBP-83-30, 17 NRC 1132, 1145 (1982).

^{2/} Operator errors of omission or commission are considered single failures when applying the single failure criterion. See Nuclear Safety Criteria for the Design of Stationary Boiling Water Reactor Plants, ANSI/ANS-52.1-1983, at § 3.2.6; see also Single Failure Criteria for Light Water Reactor Safety-Related Fluid Systems, ANSI/ANS-58.9-1981, at § 3.7.

circumstances, this contention must be rejected as an attack on the Commission's regulations establishing the single failure criterion as the design basis for the plant.

II. Absent Special Circumstances the
Single Failure Criterion Does Not Require
Consideration of Multiple Independent Failures

It is well established that the "single failure criterion" does not require consideration of multiple independent failures in evaluating nuclear plant safety. Thus, in dealing with health and safety contentions in the Partial Initial Decision of September 21, 1983, this Board held that LILCO was not required to assume an "undetectable" failure of a valve when designing against the single failure of another active component of the system. See Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit No. 1), LBP-83-57, 18 NRC 445, 482 (1983). This Board stated that requiring such analysis "would constitute a postulated double failure of active components" and that "[s]uch a reading of 10 C.F.R. Part 50, Appendix A, is clearly beyond existing regulatory requirements and inconsistent with regulatory practice." Id. at 481-82.

Similarly, other Licensing Boards have held that contentions that seek analyses assuming more than a single failure are impermissible challenges to the Commission's regulations and are, therefore, inadmissible. In Grand Gulf, the Licensing Board denied admission of a contention that attacked a safety

analysis because it was based on the single failure criterion. Mississippi Power and Light Co. (Grand Gulf Nuclear Station, Unit 1), LBP-84-19, 19 NRC 1076 (1984). The Board explained:

In fact, Appendices A and K of Part 50 adopt the single failure criterion as the regulatory standard. Petitioner seeks to impose a different standard upon the Grand Gulf facility . . . because of the asserted poor past performance of management and the inexperience and lack of training of the operators. Tr. 77-79.

As with regard to the prior two contentions, Petitioner has failed to demonstrate any nexus between the asserted poor past general performance of the Licensees and the standard it wishes the Board to impose in place of the regulatory standard imposed on all nuclear plants. Consequently, it has made no showing of a "special circumstance" which would permit the waiver of the regulatory standard.

Id. at 1082.

The Licensing Board in the Shearon Harris case also rejected a contention alleging the inadequacy of a safety analysis limited to a single failure. Carolina Power and Light Co. (Shearon Harris Nuclear Power Plant, Units 1 and 2), LBP-82-119A, 16 NRC 2069, 2090 (1982). There, the Board held that the contention was inadmissible as an attack on the NRC's regulations directing the use of a single failure analysis.^{3/}

^{3/} See also Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2), LBP-82-76, 16 NRC 1029 (1982). A contention charged that the plant's design had to be revised because a single failure in the common discharge header of the emergency feedwater system, together with delayed or omitted

(footnote continued)

Simply put, then, Intervenors may litigate contentions which assume multiple failures only where special circumstances exist. Grand Gulf, 19 NRC at 1082. Thus, in St. Lucie, the Appeal Board permitted litigation of multiple diesel generator failures stating:

We denied the applicant's motion [for reconsideration of an order requiring testimony on the probability of the failure of both diesels to start] because we believed that the single failure criterion might be inappropriate for application to diesel generators.

* * * *

The diesel generators are "components" of the onsite power system. Under the single failure approach, should one generator fail to operate, the other could be counted upon to supply the electrical needs of the plant's safety systems. Although the single failure concept may well provide adequate assurance of plant safety and public protection when the component in question has a very small probability of failure, it becomes increasingly suspect when the equipment can be expected to fail at a higher rate.

* * * *

[D]iesel generators are considerably less reliable than most other components.

Florida Power and Light Co. (St. Lucie Nuclear Power Plant,

(footnote continued)

operator action to correct the failure, would result in a loss of feedwater to all the steam generators. Id. at 1059-60. The Licensing Board rejected this contention "as not having a regulatory basis." Id. at 1060.

Unit 2), ALAB-603, 12 NRC 30, 49 (1980). As a result, the Applicant was required to include an analysis of the loss of all AC power at the site as a design basis event in the FSAR, but was permitted to assume that AC power equivalent to the output of one of the diesels would become available for use after "a reasonable period." Id. at 64.

Significantly, the St. Lucie decision does not establish that the single failure criterion is generally inapplicable to diesels generators. To the contrary, when the Commission reviewed the St. Lucie decision, it concluded that the case did not establish a generic guideline requiring that station blackout be considered a design basis event. Florida Power and Light Co. (St. Lucie Nuclear Power Plant, Unit 2), CLI-81-12, 13 NRC 838, 844 (1981).

More recently, the Appeal Board confirmed this, explaining that its holding in St. Lucie was based upon the exceptional circumstances of that case:

In St. Lucie, we determined that additional measures were necessary to mitigate a loss of all AC power (station blackout) because of a history of offsite power loss and the well-documented limited reliability of diesel generators even though the plant's redundant diesel generators met the single failure criterion.

Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit 1), ALAB-729, 17 NRC 814, 832 (1983) (footnote omitted). The Appeal Board noted that while blind adherence to the single failure criterion is inappropriate, deviation from it must be

well-founded on exceptional circumstances directly applicable to the case in question. See id. Thus, the Appeal Board criticized the TMI-1 Licensing Board for a departure from the single failure criterion based upon data that was not clearly applicable to TMI.

The importance of ensuring that plant specific exceptional circumstances exist was highlighted in a recent case involving diesel generators. There, a Licensing Board rejected a contention that the diesel generators should be subjected to a more stringent requirement than the single failure criterion found in General Design Criterion 17. Washington Public Power Supply System (WPPSS Nuclear Project No. 1), LBP-83-66, 18 NRC 780 (1983). The Licensing Board distinguished St. Lucie, stating:

However, in that proceeding the Appeal Board's justification for not following the GDC was the special circumstance of the location of the St. Lucie plant in the Florida peninsula so that the applicant's electrical distribution system (grid) could be connected to only the grids of other utilities to the north, making the system less reliable than one interconnected with multiple grids.

Here Petitioner has offered no such weighty reason for not following the Commission's rule enunciated in GDC 17 as required by § 2.758(a). The reason given . . . of emergency diesel unreliability, is a generic problem that the commission has already considered and determined not to require designating a station blackout as a design basis event in the absence of exceptional circumstances such as St. Lucie.

Id. at 791-92.

Accordingly, before this Board can permit litigation of contention (a)(iv), the Intervenors must demonstrate that there are plant specific special circumstances that justify deviating from the single failure criterion.^{4/}

III. Intervenors Have Failed
to Show Exceptional Circumstances

A County consultant has acknowledged that the issue raised in what is now EDG Contention section (a)(iv) goes beyond the single failure criterion:

I am aware that under normal interpretation of the single failure criteria, such operator errors are not required to be considered in the review.

Bridenbaugh Affidavit at 10. Bridenbaugh attempted to justify the departure from the norm because of the length of time involved in the recovery from a major accident.

However, there is no assurance that the LOOP/LOCA or LOOP events will be terminated in any precise short period of time (in fact, such events could continue for hours or days). In actual accident cases (such as at Three Mile Island-2), errors have been subsequent to the initiation of the event. It is unreasonable to ignore the possibility of such events and to fail to provide some conservatism in the load margins, particularly since LILCO proposes

^{4/} This result is consistent with 10 CFR § 2.758 which prohibits challenges to the NRC's regulations unless a showing is made that special circumstances in the particular case differ from those envisioned by the regulation. Section 2.758 requires the Licensing Board to refer any decision permitting such a challenge to the Commission for review.

to operate this plant with EDGs having a long history of serious design and quality problems.

Id. But this justification falls far short of a plant specific justification.

First, the alleged circumstance is only general speculation about the length of accidents no more applicable to Shoreham than any other plant. No attempt is made to show why operator errors are more likely at Shoreham than elsewhere. Such generalizations are inadequate to justify deviation from the single failure criterion. See TMI-1, ALAB-729, 17 NRC at 832. Second, the alleged circumstance is factually incorrect; it focuses on the wrong time interval. However long it may take to recover fully from a LOOP/LOCA, concerns about operator error causing a loss of a diesel end once the diesels are no longer needed. Consequently, the relevant interval is the time it takes to restore AC power in a LOOP or LOOP/LOCA. This, as shown below, is not substantial at Shoreham.

The record in the low power proceeding demonstrates that "the number and diversity of paths for supplying offsite power to Shoreham far exceed the regulatory requirements." Long Island Lighting Co. (Shoreham Nuclear Generating Plant, Unit 1), LBP-84-45, 20 NRC ____, slip op. at 54 (October 29, 1984) (Initial Decision). Indeed, the Miller Board found it unlikely that normal offsite power would be lost at all.

The Board finds that LILCO's substantial and diverse generating capacity, coupled with the multiplicity of paths through which power can be transmitted to the site, more than satisfies the requirements of GDC-17 with respect to normal offsite power and makes it unlikely that power would be unavailable to either the NSST or the RSST from normal offsite sources.

Initial Decision at 46.

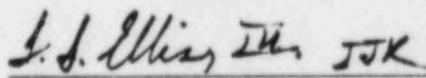
But even if offsite power is lost, the Board found that restoration of power could be accomplished from multiple sources in from six to twenty-five minutes. Power can be restored from gas turbines at Holtsville in six minutes (Initial Decision at 82 (¶ 45)), from a gas turbine at Southold in ten minutes (id. at 83 (¶ 49)), from a gas turbine at East Hampton in fifteen minutes (id. at 83 (¶ 51)), and from a gas turbine at Port Jefferson in twenty-five minutes (id. at 82 (¶ 46)). As these Miller Board findings reflect, the gas turbines surround the site geographically. Moreover, LILCO is interconnected with two different power pools, the New York Power Pool through New York City and the New England power exchange from Connecticut (under Long Island Sound). Id. at 82 (¶ 47) (citing Tr. 520-24 (Schiffmacher)). In addition, LILCO has available enhancements to its offsite power system, a 20 MW gas turbine and four 2.5 KW EMD diesel generators, which are located at Shoreham and are capable of restoring power rapidly. Id. at 87-88 (¶¶ 63, 66). Consequently, a finding of special circumstances based upon the period of time that the diesels will be used cannot be made without ignoring the conclusions of the Miller Board.

In sum, the Intervenor's have failed to establish the requisite special circumstances to permit consideration of multiple failures in contravention of the single failure criterion. Indeed, the Miller Board findings that offsite power is both highly reliable and capable of rapid restoration preclude a finding here of special circumstances.

IV. Conclusion

EDG load contention (a)(iv) requires the assumption of multiple failures beyond the single failure criterion. The Intervenor's, however, have failed to demonstrate that special circumstances exist that would justify a deviation from the NRC's regulations. Consequently, EDG load contention section (a)(iv) should be dismissed.

Respectfully submitted,
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