January 23, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
CAROLINA POWER & LIGHT COMPANY	)	Docket Nos. 50-400 OL
and NORTH CAROLINA EASTERN	)	50-401 OL
MUNICIPAL POWER AGENCY	)	
	)	
(Shearon Harris Nuclear Power	)	
Plant, Units 1 and 2)	)	

APPLICANTS' RESPONSE TO EDDLEMAN
PROPOSED CONTENTIONS 169-172
(SAFETY PARAMETER DISPLAY SYSTEM)

On January 3, 1984, intervenor Wells Eddleman filed "Wells Eddleman's new contentions re SPDS," which proposes the admission to this proceeding of Contentions 169 through 172, each of which addresses the Safety Parameter Display System ("SPDS") for the Harris plant. The proposed contentions purportedly rely upon "Safety Analysis of the Shearon Harris Safety Parameter Display System" (September 1983) (hereafter "SPDS Safety Analysis"), copies of which were transmitted to the NRC Staff, the Board and the parties by CP&L letter of December 2, 1983 (LAP-83-484).

Applicants oppose the admission of Eddleman proposed Contentions 169 to 172. The Commission's Rules of Practice, at 10 C.F.R. § 2.714(b), require that an intervenor set forth the bases for each proposed contention with reasonable specificity. Because these proposed contentions are grounded on a misunderstanding of both the purpose of the NRC's requirements

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for a SPDS, and the functioning of the particular SPDS to be used at the Harris plant, they are utterly lacking in technical basis and should be rejected by the Board.[1/]

As a part of its TMI Action Plan, the NRC Staff recommended the upgrading of emergency response and support facilities (Item III.A.1.2 of NUREG-0737, Clarification of TMI Action Plan Requirements (November 1980)). In NUREG-0696, Functional Criteria for Emergency Response Facilities (February 1981),[2/] the Staff identified functional criteria for a Safety Parameter Display System. Additional clarification regarding the SPDS was provided in Supplement 1 to NUREG-0737 (Generic Letter No. 82-33, December 17, 1982).

SPDS is intended to help operating personnel in the control room make quick assessments of plant safety status. See NUREG-0696, § 5. An operator aid, it concentrates key plant parameters on a display so as to enhance the operator's capability to assess plant status. Id. The

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1/ Without agreeing with Mr. Eddleman's discussion of lateness factors (ii) through (v) of 10 C.F.R. § 2.714(a)(1), Applicants do not raise a timeliness objection to proposed Contentions 169 to 172, or question the balancing of factor (i) over the others in Mr. Eddleman's favor, in view of the Board's earlier statement on the opportunity to base new contentions on the SPDS Safety Analysis. See Memorandum and Order (Ruling on Wells Eddleman's Proposed Contentions Concerning Detailed Control Room Design Review . . .) at 4 (Oct. 6, 1983).

2/ According to Generic Letter No. 17 (March 5, 1981), which transmitted NUREG-0696 to all licensees of operating plants and holders of construction permits, compliance with NUREG-0696 is not a requirement, but the document has been approved by the Commission as general guidance.

SPDS is not intended to replace the operator's need for or reliance on emergency operating procedures, nor is it intended to direct the operator's attention away from the control room panel instrumentation which is required (see General Design Criteria 13 and 19 of Appendix A to 10 C.F.R. Part 50) to provide the operators with the information necessary for safe reactor operation under normal, transient and accident conditions. Thus, requirements applicable to control room instrumentation are not needed for this augmentation. NUREG-0737, Supp. 1 at 7.

Rather, because it integrates plant status data and prioritizes that information, SPDS helps the operator focus attention on the plant parameters with which the operator should be concerned. The SPDS need not be Class 1E or meet the single-failure criterion. It also need not be seismically qualified. In fact, operators are to be trained to respond to accident conditions both with and without the SPDS available. NUREG-0737, Supp. 1 at 7.

The SPDS designed for the Harris plant has been designed to satisfy the purpose which the SPDS is intended to serve. See SPDS Safety Analysis. As the following discussion illustrates, all of the particular concerns raised in Eddleman proposed Contentions 169 through 172 stem in part from Mr. Eddleman's apparent misunderstanding of the purpose of the SPDS.

Contention 169. There are a number of separate and erroneous points made by Mr. Eddleman in Contention 169. First, Mr. Eddleman

criticizes the Harris SPDS because, in his view, the fact that SPDS logic does not indicate loss of quality signals for parameters until all signals are lost, and uses "1 out of 2 logic" when only 2 signals are left, means that the system does not provide accurate information. Further, he criticizes the SPDS for not providing an early indication that instruments or signal lines may be failing. He also erroneously claims that the system uses average values only; thus, in his view, it improperly fails to alert operators to widely divergent readings of the same variable.

Mr. Eddleman is correct that the SPDS does not indicate loss of quality signals for parameters until all signals are lost. However, it is not the purpose of the system to alert the operator to the status of instrumentation. This information is otherwise available to the operator in the control room. As stated in the SPDS Safety Analysis, "the primary function of the SPDS is to aid in the rapid detection of abnormal operating conditions." SPDS Safety Analysis at 1.[3/] As long as the SPDS has operable instrumentation available to it to perform this function, it will do so. This does not mean that the information it does provide is inaccurate. The system's ability to check for quality signals enables it to rely only on reliable instrumentation. Id. at 25. The use of "1 out of 2 logic" for a parameter simply means that the SPDS display will reflect an adverse plant condition when

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3/ Secondary functions of the SPDS include analyzing and diagnosing the abnormality and providing an informational basis for corrective action execution. SPDS Safety Analysis at 1.

only two good signals are available and one signal is indicating the presence of that condition.

Thus, the fact that the SPDS does not provide an early indication that instrumentation or signal lines may be failing and, similarly, its failure to alert operators to possible widely divergent readings of the same variable are totally irrelevant. Notwithstanding the importance of this information, it is not the purpose of the SPDS to direct the operator's attention to those instrumentation conditions. Rather, as previously stated, the SPDS is designed to assist the operator in responding to operating conditions adverse to safety.

Finally, contrary to Mr. Eddleman's statement, the SPDS does not use average values only. As stated in the SPDS Safety Analysis at 24-25, analog values are averaged only if a particular parameter is not used by the Reactor Protection System (RPS) or Engineered Safeguards Features Actuation System (ESFAS). If the parameter is used by the RPS or ESFAS, the actual instrumentation values are used, along with the logic applicable to actuation of that system. An example of the former averaged parameter is core thermocouple readouts; an example of the latter is reactor coolant system pressurizer pressure level. Of course, all individual instrumentation data is independently available to the operator.

In summary, Contention 169 is without basis. It is grounded in part on Mr. Eddleman's faulty understanding of the system. It also criticizes the SPDS for not providing

information it is not designed to provide -- information otherwise available to the operator, and which would interfere with the proper functioning of the SPDS if it were programmed to provide the information.

Contention 170. In this contention, Mr. Eddleman criticizes the SPDS for not taking sufficient account of overcooling, which could ultimately lead to pressure vessel failure. Mr. Eddleman's criticism is incorrect. In fact, the SPDS directs the attention of the operator to the precise parameters on which the operator's attention should be focused.

Cooldown rates in excess of 100°F per hour do not, in themselves, lead to brittle fracture or flow propagation that in turn might lead to primary system boundary failure. The integrity of the vessel is not challenged by such cooldown rates if all reactor coolant system (RCS) cold leg temperatures remain above a temperature that is shown not to result in a pressurized thermal shock (PTS) condition under any RCS pressure. This phenomenon is addressed in the Westinghouse Owners' Group Emergency Response Guidelines, Rev. 1 (Sept. 1, 1983). See also SECY 82-465 (Nov. 23, 1982), letter from William J. Dircks, the Executive Director of Operations, to the Commissioners concerning pressurized thermal shock.

The SPDS specifies the RCS cold leg temperature limits to avoid PTS, and directs the operator to take appropriate, conservative action if temperatures are lower than limiting

values. Furthermore, in some high pressure/temperature transients, the safest course of action is to exceed the 100°F/hr. cooldown rate. The implicit suggestion by Mr. Eddleman in Contention 170 that core cooling should never exceed this rate is incorrect.

In summary, the phenomenon of overcooling and PTS is fully considered in the design of the SPDS, and Mr. Eddleman has ignored relevant available information which clearly undermines the asserted basis for the proposed contention.

Contention 171. In this contention, Mr. Eddleman alleges that the Harris SPDS is defective because it does not provide accurate information to operators in the event of a large loss-of-coolant accident (LOCA). The example cited by Mr. Eddleman to support this claim is the green signal which is displayed on the SPDS for the RCS Integrity critical safety function when a large LOCA has occurred. This set of conditions is referred to on page 45 of the SPDS Safety Analysis. Contrary to Mr. Eddleman's claim, the SPDS does provide accurate information to the operator in the event of a large LOCA.

The purpose of the SPDS is to direct the operator's attention to the critical safety function of most importance given current plant conditions. All of the six critical safety functions are prioritized, with subcriticality given first priority and RCS Inventory given sixth priority. See SPDS Safety Analysis at 25-27. Further, the operato··'s

attention is directed at particular functions in a different priority by the use of a color scheme (red, magenta, yellow, green) which alerts the operator to where attention must be focused as a transient occurs and as events are changing. Id. at 5-7. (If there are two red signals, the function priority system applies.) In this manner, SPDS assists the operator in focusing on the appropriate emergency procedure.

In the example given on page 45 of the SPDS Safety Analysis where a large LOCA has already occurred, the RCS Integrity function is green. Based on the size LOCA and the indicated cooldown rate seen following the LOCA, the RCS Integrity status tree could indicate a color ranging from red to green, depending on the LOCA condition. It should be noted that the procedures associated with RCS Integrity are aimed at preventing loss of integrity when conditions which could lead to a LOCA have occurred.

Furthermore, for LOCA conditions the operator knows that the RCS integrity has already been lost and therefore the operator's actions are aimed at maintaining the remaining fission product barriers. This is accomplished by the remaining status trees. The six critical safety functions must be considered as a whole, with each one supplying a portion of the overall perspective of plant safety, rather than expecting each function to supply that perspective independently. The RCS Integrity safety function is designed to warn the operator of an impending PTS condition, while

other safety functions such as core cooling, RCS Inventory and Containment adequately indicate the existence of a large LOCA and direct the operator to take compensatory actions if the operator has not already initiated them through attention to the actions required by the emergency operating procedures. The SPDS thus adequately provides an independent means of assessing the safety status of the plant and acts in concert with the emergency operating procedures to direct the operator to mitigate the consequences of an accident situation successfully.

Thus, contrary to Mr. Eddleman's opinion, in the particular case to which he refers, maintaining RCS Integrity is not the issue at that moment -- because it has already been lost.

Contention 172. Contention 172 is not really a separate contention. Rather, it reiterates the concerns previously expressed by Mr. Eddleman about "dropped" loss of quality signals (Contention 169), the "OK" RCS Integrity signal during a large LOCA (Contention 171), overcooling (Contention 170), and variations in instrumentation signals (Contention 169). Mr. Eddleman then draws the conclusion implicit in Contentions 169, 170 and 171 -- namely, that priorities established in SPDS for operator action during an event may actually confuse or misdirect rather than assist the operator. Because Contentions 169, 170 and 171 are without any basis in fact, Contention 172 also should be rejected. The operators can use SPDS, which reflects the integrated

experience of the members of the Westinghouse Owners Group and which relies on plant specific data, to assist them in prioritizing the actions they need to take during a transient. The operators will be trained on the use of the SPDS, as well as on the use of emergency operating procedures, which are based on the Westinghouse Owners' Group Emergency Response Guidelines.

For the reasons stated above, Eddleman Contentions 169, 170, 171 and 172 fail to meet the basis requirement of 10 C.F.R. § 2.714(b). Safety-related display instrumentation, which Mr. Eddleman has neither challenged nor addressed, is fully described in FSAR § 7.5. In his attacks on the SPDS, Mr. Eddleman ignores the role of this primary instrumentation in guiding operator response. Consequently, where his proposed contentions are not plainly in error because of Mr. Eddleman's misreading of the SPDS Safety Analysis or failure to address related information, they address standards and functions inapplicable to the SPDS. Accordingly, the Board should not admit these contentions to the proceeding.

Respectfully submitted,

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Dated: January 23, 1984

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CERTIFICATE OF SERVICE

I hereby certify that copies of "Applicants' Response to Eddleman Proposed Contentions 169-172 (Safety Parameter Display System)" were served this 23rd day of January, 1984, by deposit in the U.S. mail, first class, postage prepaid, to the parties on the attached Service List.

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