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SUBJECT: Responds to NRC 900601 ltr re single electrical failures at plant.

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United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23
SINGLE ELECTRICAL FAILURES

Gentlemen:

On April 19, 1990, Carolina Power & Light Company (CP&L) met with the NRC to present an overview of our Design Basis Document (DBD) and Probabilistic Risk Assessment (PRA) programs as part of our ongoing dialogue with the NRC Staff on the 10CFR50.54(f) single electrical failure issue at H. B. Robinson Steam Electric Plant, Unit No. 2 (HBR2). Meeting minutes were produced by NRC on May 14, 1990, and a request for additional information was subsequently submitted to CP&L on June 1, 1990. This letter responds specifically to your June 1, 1990 letter while also considering the points raised in the May 14, 1990 meeting summary.

As requested in your June 1, 1990 letter, we will provide to the NRC the results of our 10CFR50 Appendix K single failure analysis for the Emergency Core Cooling System (ECCS) within 60 days following the end of refueling outage 13, presently scheduled to begin in September 1990.

Your June 1, 1990 letter also repeats the NRC's request "to identify and correct single electrical failure vulnerabilities per 10 CFR Part 50, Appendix A, General Design Criteria (GDC) for safety systems other than the ECCS." This appears to be a backfit of the 1971 GDC on HBR2 without complying with the NRC's backfit rule, 10CFR50.109. We do not believe that the backfit rule, if properly applied, would result in the imposition of the 1971 final GDC on HBR2. As described below, although HBR2 does not literally comply with every aspect of the 1971 GDC, we firmly believe that HBR2 is a safe plant that was and is licensed to operate without such literal compliance.

In both our letter of June 14, 1989 and meeting presentation of April 19, 1990, we stated, "Since the GDC are intended to provide engineering goals by which reactor safety can be satisfactorily gauged, we feel strongly that the programs described above [DBD and PRA] will assure that the plant meets the basic intent of the GDC, which is to ensure that structures, systems, and

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components important to safety are designed and constructed to provide reasonable assurance that the plant can be operated without undue risk to the health and safety of the public." It appears that the NRC should agree with this position since Design Basis Reconstitution and Probabilistic Risk Assessment as part of the Individual Plant Evaluation (IPE) process are two of the primary initiatives by the NRC to assure and enhance safe plant operation, and which also form the cornerstone of NRC life extension initiatives. We believe that HBR2 is a safe plant which meets the statutory requirements of the Atomic Energy Act, Section 182. We must point out, however, that though the 1971 GDC may be a codification of the requirements for design at the time they were issued, they were not a codification of the requirements in effect at the time that HBR2 was designed, constructed, and licensed. The design criteria to which the plant was built and licensed are based on the 1967 Proposed GDC, as stated in our Final Safety Analysis Report (FSAR) and acknowledged in the Staff's May 18, 1970, Safety Evaluation. The revised GDC were ultimately published on February 20, 1971, to become effective May 21, 1971, almost one year after the issuance of the HBR2 operating license dated July 31, 1970. Among other things, these revised GDC differed from the proposed GDC in the specific area of single failure definition, i.e., the revised GDC provide an explicit definition of single electrical failure which includes failures of passive components, whereas the proposed GDC address failures of single active components (Criterion 39 and Criterion 41). As stated in our letter of June 14, 1989 (NLS-89-173), at the time of issuance in 1971, there was no statement indicating that the final GDC were to be applied retroactively to licensed reactors, or that individual licensees need provide any response to the AEC, including any assessment of deviations or "equivalent degrees of safety." Thus, the HBR2 design and licensing basis does not require an evaluation of single passive failures in accordance with the revised 1971 GDC.

Our understanding in this regard is confirmed by the many discussions of the evolution of NRC requirements recently published by the NRC in connection with its proposed rule on plant license renewal. For example, Draft NUREG-1412, "Foundation for the Adequacy of the Licensing Bases," states at pages 1-4 and 3-1, that: "the GDCs were formally adopted in 1971 and have been used as guidance in reviewing new plant applications since that time." At page 3-2 of that document, the NRC also states that: "Because of the evolutionary nature of the licensing requirements discussed above and the developments in technology over the years, operating nuclear power plants embody a broad spectrum of design features and requirements depending on when the plant was constructed, who was the manufacturer, and when the plant was licensed for operation . . . The staff reviews for all plants that have been granted an operating license since 1967 have determined that the information provided by each applicant has been sufficient to conclude that the plant design satisfies the intent of the applicable GDC." It is significant that the underlying regulatory philosophy of the Commission's proposed rule on plant license renewal is retention of the current licensing basis for each plant. There is no requirement that plants licensed before 1971 comply with the final GDC in

order to renew their licenses, or to analyze any deviations to demonstrate an equivalent degree of safety (55 Fed. Reg. 29,043 at 29,045-46 [July 17, 1990]). At the same time , we note that where subsequent rulemaking or revision to the CFR has called out the need for a review of single passive failure in specified areas or systems (Appendix R, Appendix K) these reviews have been undertaken.

However, notwithstanding the design and licensing basis for HBR2, CP&L has dedicated substantial resources to both the design basis reconstitution effort and the design/operational risk-based evaluation program. As part of the validation phase of the DBD project, several hundred cables from key safety systems have already been evaluated against the HBR2 separation criteria. The originally routed cables have thus far shown themselves to be a "train" oriented system, even though the original design criteria only called for functional separation of redundant cables. Two routing exceptions out of the several hundred cables reviewed have been identified to date. These exceptions have been from cables installed through modifications. These modification cables with improper separation have been evaluated as satisfactory for short term continued operation, but have been scheduled to be rerouted. It is our intention to continue reviewing cables on a system basis as part of our DBD validation effort, presently scheduled through 1992. Additional discrepancies which are identified will continue to be responsibly evaluated and resolved as part of the validation process. While this effort is not structured to evaluate the existing HBR2 design against the revised GDC point-by-point, it is sensitive to the separation issue and has shown thus far that the preponderance of the HBR2 safety-related cables are redundant and separated, from the power sources and major E-buses up to the control room/spread room complex and other control panels, power distribution centers, and system components.

In addition to the DBD effort, the ongoing PRA evaluation is looking at vulnerabilities in this electrical design (as well as overall plant design and operations) regardless of whether or not the GDC are met. The PRA evaluation does not restrict itself to single failures, but rather considers active and passive, electrical and mechanical, single, multiple, and common cause failure modes. Those that show a high contribution to core damage frequency are evaluated for correction. Although the PRA effort is an ongoing multi-year project which is continually being refined, it has already proven to be a very valuable tool which has been applied to enhance the safety of the HBR2 facility. As a result of the PRA to date, changes have been made to design, procedures, and training which have improved the overall core damage frequency in keeping with the goals of the Severe Accident Policy/IPE generic letter. As this is an ongoing program, we fully expect additional understanding and enhancement of plant design and operation as plant specific data is evaluated and as further analysis of conservatism and uncertainties occurs, leading to refinement and improvement of the overall PRA model.

Actions taken which comply with the IPE/PRA generic letter provide a structured methodology to tackle the complexity of nuclear plant design and operation. The process provides a look at "what is" regardless of how it was originally designed. Potential vulnerabilities that are identified by the

process are quantifiable (within an uncertainty range) and therefore are able to be "ranked" in order to allow us to focus on those vulnerabilities where the apparent risk is highest and the potential safety gain for correction is the greatest. By its nature the process will also tell us which other vulnerabilities are of such low contribution to the overall risk of the plant that correction of the vulnerability would have inconsequential effect on overall plant risk and thus our effort would be much better placed elsewhere.

This approach is fully consistent with the approach adopted by the NRC during the early 1980's in its Systematic Evaluation Program (SEP). The NRC, through the SEP, reviewed the design of older (HBR2 vintage) operating nuclear power plants to reconfirm and document their safety. From an initial list of pre-determined topics, NRC made an evaluation to determine which topics differed from current criteria. Those that differed were considered in an integrated assessment of each plant, evaluating the safety significance and other factors to arrive at decisions on whether backfitting was necessary from an overall plant safety viewpoint. Engineering judgement as well as a limited PRA were used to arrive at these decisions. The PRA categorized these issues by the impact their resolution would have on risk. The combination of DBD and PRA at HBR2 is a close analogy to the SEP. The goals are similar to the Integrated Plant Safety Assessment Phase, i.e. balanced and integrated decisions, focus on safety significance, and optimal utilization of NRC and CP&L resources. Furthermore, the HBR2 approach is utilizing a much more mature PRA process with better tools than were available during the SEP, and our PRA evaluation is looking at the entire plant, much of it design-basis validated, not just focusing on selected criteria deviations. We believe that while HBR2 was not a part of the SEP process, our DBD and PRA programs fulfill similar goals using similar processes.

In summary, while HBR2 was not designed, constructed, and licensed to comply with the revised 1971 GDC, and while our present DBD and PRA programs do not provide a point by point comparison and evaluation to these revised GDC, our original licensing basis complies with the proposed 1967 GDC as stated in our FSAR and acknowledged in the Staff's May 18, 1970 Safety Evaluation, our understanding of the original design basis is being significantly enhanced by our DBD efforts, and this design basis is undergoing an extensive risk based evaluation as part of our PRA program. Although this process will not show specific point-by-point equivalence with the 1971 GDC, it is our position that, when completed, it will show an acceptable level of safety similar to the SEP plants of HBR2 vintage. While the GDC are intended to provide up-front engineering goals by which reactor safety can be satisfactorily gauged, our DBD and PRA programs are providing a "look back" evaluation and prioritization method to assess, prioritize, and provide a basis to correct potential risk significant vulnerabilities to enhance reactor safety.

Our overall programs will assure that the plant meets the basic intent of the GDC. We consider any additional requirement to strictly comply with the 1971 revised GDC, which were not in effect at the time of our licensing, to be a backfit under the provisions of 10CFR50.109. If the NRC intends to backfit the 1971 GDC on HBR2, we ask that it be done in compliance with the backfit rule.

We believe that we are presently applying our resources in a manner which is consistent (1) with our management objectives for continued safe and reliable operation, and (2) with Commission policies regarding determination of the appropriate level of safety (for example, backfitting and relicensing) and the general equitable treatment of safe licensed nuclear plants.

Yours very truly,

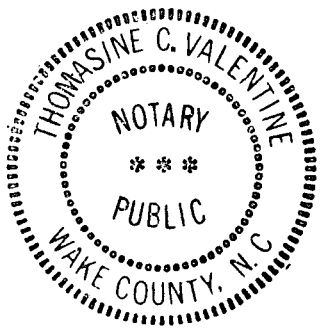
A. B Cutter

RWP/ecc (763ECC)

A. B Cutter, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, contractors, and agents of Carolina Power & Light Company.

Thomasine C. Valentine
Notary (Seal)

My commission expires: 1-31-95



cc: Mr. S. D. Ebneter
Mr. L. Garner (NRC-HBR)
Mr. R. Lo
Mr. S. Varga