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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

APPLICANTS' INTERROGATORIES  
AND REQUEST FOR PRODUCTION OF DOCUMENTS  
TO INTERVENOR WELLS EDDLEMAN (FIRST SET)

Pursuant to 10 C.F.R. §§ 2.740b and 2.741 and to the Atomic Safety and Licensing Board's "Memorandum and Order (Reflecting Decisions Made Following Prehearing Conference)" of September 22, 1982, Carolina Power & Light Company and North Carolina Eastern Municipal Power Agency hereby request that Intervenor Wells Eddleman answer separately and fully in writing, and under oath or affirmation, each of the following interrogatories, and produce and permit inspection and copying of the original or best copy of all documents identified in the responses to interrogatories below. Under the Commission's Rules of Practice, answers or objections to these interrogatories must be served within 14 days after service of the interrogatories; responses or objections to the request for

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production of documents must be served within 30 days after service of the request.

These interrogatories are intended to be continuing in nature, and the answers should promptly be supplemented or amended as appropriate, pursuant to 10 C.F.R. § 2.740(e), should Mr. Eddleman or any individual acting on his behalf obtain any new or differing information responsive to these interrogatories. The request for production of documents is also continuing in nature and Mr. Eddleman must produce immediately any additional documents he, or any individual acting on his behalf, obtains which are responsive to the request, in accordance with the provisions of 10 C.F.R. § 2.740(e).

Where identification of a document is requested, briefly describe the document (e.g., book, letter, memorandum, transcript, report, handwritten notes, test data) and provide the following information as applicable: document name, title, number, author, date of publication and publisher, addressee, date written or approved, and the name and address of the person or persons having possession of the document. Also state the portion or portions of the document (whether section(s), chapter(s), or page(s)) upon which you rely.

Definitions. As used hereinafter, the following definitions shall apply:

The "ER" is the Environmental Report - Operating License Stage for the Shearon Harris Nuclear Power Plant, as amended.

The "FSAR" is the Final Safety Analysis Report for the Shearon Harris Nuclear Power Plant, as amended.

"Applicants" is intended to encompass Carolina Power & Light Co., North Carolina Eastern Municipal Power Agency and their contractors for the Harris Plant.

"Document(s)" means all writings and records of every type in the possession, control or custody of Mr. Eddleman or any individual acting on his behalf, including, but not limited to, memoranda, correspondence, reports, surveys, tabulations, charts, books, pamphlets, photographs, maps, bulletins, minutes, notes, speeches, articles, transcripts, voice recordings and all other writings or recordings of any kind; "document(s)" shall also mean copies of documents even though the originals thereof are not in the possession, custody, or control of Mr. Eddleman; a document shall be deemed to be within the "control" of Mr. Eddleman or any individual acting on his behalf if they have ownership, possession or custody of the document or copy thereof, or have the right to secure the document or copy thereof, from any person or public or private entity having physical possession thereof.

#### General Interrogatories

1(a). State the name, present or last known address, and present or last known employer of each person known to you to have first-hand knowledge of the facts alleged, and upon which you relied in formulating allegations, in each of your

contentions which are the subject of this set of interrogatories.

(b). Identify those facts concerning which each such person has first-hand knowledge.

(c). State the specific allegation in each contention which you contend such facts support.

2(a). State the name, present or last known address, and present or last employer of each person, other than affiant, who provided information upon which you relied in answering each interrogatory herein.

(b). Identify all such information which was provided by each such person and the specific interrogatory response in which such information is contained.

3(a). State the name, address, title, employer and educational and professional qualifications of each person you intend to call as an expert witness or a witness relating to any contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) regarding which each such person is expected to testify.

(c). State the subject matter to which each such person is expected to testify.

4(a). Identify all documents in your possession, custody or control, including all relevant page citations, pertaining

to the subject matter of, and upon which you relied in formulating allegations in each contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) to which each such document relates.

(c). State the specific allegation in each contention which you contend each document supports.

5(a). Identify all documents in your possession, custody or control, including all relevant page citations, upon which you relied in answering each interrogatory herein.

(b). Identify the specific interrogatory response(s) to which each such document relates.

6(a). Identify any other source of information, not previously identified in response to Interrogatory 2 or 5, which was used in answering the interrogatories set forth herein.

(b). Identify the specific interrogatory response(s) to which each such source of information relates.

7(a). Identify all documents which you intend to offer as exhibits during this proceeding to support the contentions which are the subject of this set of interrogatories or which you intend to use during cross-examination of witnesses presented by Applicants and/or the NRC Staff on each contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) to which each document relates and the particular page citations applicable to each contention.

Interrogatories on Contention 9  
(Environmental Qualification of Electrical Equipment)

9-1(a). State whether you are aware that the Nuclear Regulatory Commission ("NRC") has recently issued its final rule, 10 C.F.R. § 50.49, on the environmental qualification of electrical equipment. See Notice of Final Rulemaking, 48 Fed. Reg. 2729 (January 21, 1983), a copy of which is attached hereto.

(b). State whether you are aware that Applicants will be required to comply with the criteria of 10 C.F.R. § 50.49 with respect to all safety-related electrical equipment not already qualified under NUREG-0588 ("Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment") (1979).

(c). State whether you believe that Applicants will fail to comply with the applicable criteria of 10 C.F.R. § 50.49.

(d). If the answer to (c) above is affirmative, identify all specific criteria of 10 C.F.R. § 50.49 with which you believe Applicants will fail to comply. As to each such criterion, describe in detail the bases for your conclusion, including the reasons for identifying the criterion.

(e). If the answer to (c) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 9.

9-2(a). State whether you believe that Applicants are failing to comply with the applicable criteria of NUREG-0588.

(b). If the answer to the preceding interrogatory is affirmative, identify all specific criteria of NUREG-0588 with which you believe Applicants are failing to comply. As to each such criterion, describe in detail the bases for your conclusion, including the reasons for identifying the criterion.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 9.

9-3(a). Identify all NRC rules, regulations, regulatory guides, publications and endorsed national standards pertaining to the environmental qualification of electrical equipment, other than 10 C.F.R. § 50.49 and NUREG-0588, with which you believe Applicants fail or will fail to comply. As to each such item, describe in detail the bases for your conclusion, including the reasons for identifying the item.

(b). Identify all specific criteria of each item identified in response to (a) above with which you believe Applicants fail or will fail to comply. As to each such criterion, describe in detail the bases for your conclusion, including the reasons for identifying the criterion.

9-4(a). State whether you believe that FSAR § 3.11 ("Environmental Design of Active Mechanical and Electrical Equipment"), as amended June 30, 1982 (Amendment 3), fails to show compliance with 10 C.F.R. § 50.49.

(b). If the answer to (a) above is affirmative, identify all specific criteria of 10 C.F.R. § 50.49 with which you believe FSAR § 3.11 fails to show compliance. As to each such criterion, describe in detail the bases for your conclusion, including the reasons for identifying the criterion.

(c). As to each criterion identified in response to (b) above, state what change(s) you believe Applicants must make for FSAR § 3.11 to show compliance with 10 C.F.R. § 50.49? Describe in detail the bases for your conclusions.

(d). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 9.

9-5(a). State whether you believe that the format of FSAR Figure 3.11.1-1 ("Master List Legend") fails to show compliance with the criteria of 10 C.F.R. § 50.49.

(b). If the answer to (a) above is affirmative, identify all specific criteria of 10 C.F.R. § 50.49 with which you believe Figure 3.11.1-1 fails to show compliance. As to each such criterion, describe in detail the bases for your conclusion, including the reasons for identifying the criterion.

(c). As to each criterion identified in response to (b) above, what change(s) do you believe Applicants must make for Figure 3.11.1-1 to show compliance with 10 C.F.R. § 50.49? Describe in detail the bases for your conclusions.

(d). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 9.

9-6(a). State whether you believe that the format of FSAR Figure 3.11.1-2 ("Component Evaluation Sheet Legend") fails to show compliance with the criteria of 10 C.F.R. § 50.49.

(b). If the answer to (a) above is affirmative, identify all specific criteria of 10 C.F.R. § 50.49 with which you believe Figure 3.11.1-2 fails to show compliance. As to each such criterion, describe in detail the bases for your conclusion, including the reasons for identifying the criterion.

(c). As to each criterion identified in response to (b) above, state what change(s) you believe Applicants must make for Figure 3.11.1-2 to show compliance with 10 C.F.R. § 50.49. Describe in detail the bases for your conclusions.

(d). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 9.

9-7(a). State whether you believe that FSAR § 3.11 fails to show compliance with NUREG-0588.

(b). If the answer to (a) above is affirmative, identify all specific criteria of NUREG-0588 with which you believe FSAR § 3.11 fails to show compliance. As to each such criterion, describe in detail the bases for your conclusion, including the reasons for identifying the criterion.

(c). As to each criterion identified in response to (b) above, state what change(s) you believe Applicants must make for FSAR § 3.11 to show compliance with NUREG-0588. Describe in detail the bases for your conclusions.

(d). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 9.

9-8(a). State whether you believe that the format of FSAR Figure 3.11.1-1 fails to show compliance with the criteria of NUREG-0588.

(b). If the answer to (a) above is affirmative, identify all specific criteria of NUREG-0588 with which you believe Figure 3.11.1-1 fails to show compliance. As to each such criterion, describe in detail the bases for your conclusion, including the reasons for identifying the criterion.

(c). As to each criterion identified in response to (b) above, state what change(s) you believe Applicants must make for Figure 3.11.1-1 to show compliance with NUREG-0588. Describe in detail the bases for your conclusions.

(d). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 9.

9-9(a). State whether you believe that the format of FSAR Figure 3.11.1-2 fails to show compliance with the criteria of NUREG-0588.

(b). If the answer to (a) above is affirmative, identify all specific criteria of NUREG-0588 with which you believe Figure 3.11.1-2 fails to show compliance. As to each such criterion, describe in detail the bases for your conclusion, including the reasons for identifying the criterion.

(c). As to each criterion identified in response to (b) above, state what change(s) you believe Applicants must make for Figure 3.11.1-2 to show compliance with NUREG-0588. Describe in detail the bases for your conclusions.

(d). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 9.

9-10(a). Identify all applicable NRC rules, regulations, regulatory guides, publications and endorsed national standards, other than 10 C.F.R. § 50.49 and NUREG-0588, with which you believe FSAR § 3.11 fails to show compliance. As to each such item, describe in detail the bases for your conclusion, including the reasons for identifying the item.

(b). Identify all specific criteria of each item identified in response to (a) above with which you believe FSAR § 3.11 fails to show compliance. As to each such criterion, describe in detail the bases for your conclusion, including the reasons for identifying the criterion.

(c). As to each criterion identified in response to (b) above, state what change(s) you believe Applicants must make for FSAR § 3.11 to show compliance with the applicable item identified in response to (a) above. Describe in detail the bases for your conclusions.

(d). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 9.

Interrogatories on Contention 11  
(Polyethylene Cable Insulation Degradation)

11-1(a). Describe in detail the bases for your conclusion that "polyethylene, used as cable insulation, deteriorate[s] much more rapidly under long-term doses of gamma radiation than [it does] when exposed to the same total dose over a much shorter period of time." Supplement to Petition To Intervene by Wells Eddleman, dated May 14, 1982 ("Supplement"), at 56.

(b). Identify the Sandia Laboratories study or studies by K. Gillen and R. Clough which you believe demonstrate the degradation effect described in (a) above.

(c). Identify all facts, findings and conclusions stated in each of the studies identified in response to (b)

above which you believe demonstrate the degradation effect described in (a) above. As to each such item, describe in detail the bases for your conclusion, including your reasons for identifying the item.

(d). State whether you believe that dose rate testing of polyethylene cable insulation which has been stripped from the wire, thereby exposing a much larger surface area to the ambient atmosphere than would be exposed if the cable were installed in an operating plant, could increase oxygen diffusion into the materials, thus increasing oxidation and degradation of the insulation. If not, describe in detail the bases for your conclusion.

(e). State whether you believe that Cobalt-60 used as the radiation source in dose rate testing of polyethylene cable insulation could produce a greater degree of degradation in the materials than the gamma emissions from an operating plant's radiation sources. If not, describe in detail the bases for your conclusion.

11-2(a). State the lowest gamma radiation dose rate above which you believe the degradation effect described in Interrogatory 11-1 causes unsafe conditions to occur. Describe in detail the bases for your conclusion.

(b). State the highest gamma radiation dose rate below which you believe the degradation effect described in Interrogatory 11-1 causes unsafe conditions to occur. Describe in detail the bases for your conclusion.

(c). State the total, integrated gamma radiation dose above which you believe the degradation effect described in Interrogatory 11-1 causes unsafe conditions to occur. Describe in detail the bases for your conclusion.

11-3(a). Identify what you believe to be the specific property or properties -- e.g., tensile strength, elongation, insulation resistance, dielectric strength -- necessary for polyethylene cable insulation to perform its proper function. As to each such property, describe in detail the bases for your conclusion, including the reasons for identifying the property.

(b). State what you believe to be the acceptable percentage of reduction of each property identified above in order for polyethylene cable insulation to perform its function. As to each property, describe in detail the bases for your conclusion.

11-4(a). Describe in detail the bases for your conclusion that the "loss of cable ... insulation would lead to short circuits" at Shearon Harris Nuclear Power Plant ("SHNPP"). Supplement at 57.

(b). Explain the discrepancy between your statement that short circuits "would" occur and your statement that short circuits would "very likely" occur if cable were to lose its insulation. I<sup>d</sup>.

11-5. Identify all incidents, of which you are aware, in which the degradation effect described in Interrogatory 11-1 has caused unsafe conditions to occur in commercial nuclear power plants which are now operating or at one time did operate. As to each such incident, provide all pertinent details.

11-6. Identify all electrical cables with polyethylene insulation within SNHPP which you believe to be potentially dangerous as a result of the degradation effect described in Interrogatory 11-1. As to each such cable, describe in detail the bases for your conclusion, including the reasons for identifying the cable.

11-7. Identify all locations within SHNPP which you believe to be potentially dangerous as a result of the degradation effect described in Interrogatory 11-1. As to each such location, describe in detail the bases for your conclusion, including the reasons for identifying the location.

11-8(a). Identify all areas within SHNPP, by radiation zone, in which the gamma radiation dose rate during normal operating conditions falls within the range of dose rates which you identified in response to Interrogatory 11-2 as causing unsafe conditions to occur. As to each such area (radiation zone), describe in detail the bases for your conclusion, including the reasons for identifying the area (radiation zone).

(b). Identify all areas within SHNPP, by radiation zone, in which the total, integrated gamma radiation dose during normal operating conditions exceeds the total, integrated dose which you identified in response to Interrogatory 11-2 to be necessary to produce the degradation effect described in Interrogatory 11-1. As to each such area (radiation zone), describe in detail the bases for your conclusion, including the reasons for identifying the area (radiation zone).

11-9(a). Identify all areas within SHNPP, by radiation zone, in which the gamma radiation dose rate during accident conditions falls within the range of dose rates which you identified in response to Interrogatory 11-2 as causing unsafe conditions to occur. As to each such area (radiation zone), describe in detail the bases for your conclusion, including the reasons for identifying the area (radiation zone). Also identify each accident condition assumed in answering the Interrogatory, and which areas (radiation zones) are relevant as to that condition.

(b). Identify all areas within SHNPP, by radiation zone, in which the total, integrated gamma radiation dose during accident conditions exceeds the total, integrated dose which you identified in response to Interrogatory 11-2 to be necessary to produce the degradation effect described in Interrogatory 11-1. As to each such area (radiation zone),

describe in detail the bases for your conclusion, including the reasons for identifying the area (radiation zone). Also identify each accident condition assumed in answering the Interrogatory, and which areas (radiation zones) are relevant as to that condition.

(c). State whether you believe that the degradation effect described in Interrogatory 11-1 need be addressed for accident conditions, since accident dose rates will decay rapidly following reactor shutdown. If so, describe in detail the bases for your conclusion.

11-10(a). State what you believe to be acceptable inspection standards - e.g., inspection methods, inspection frequencies - in order to detect the degradation effect described in Interrogatory 11-1. As to each such standard, describe in detail the bases for your conclusion.

(b). Identify all NRC regulations, regulatory guides, publications and endorsed national standards which you believe to establish acceptable inspection standards for safety-related electrical cables in order to prevent the degradation effect described in Interrogatory 11-1. As to each such item, describe in detail the bases for your conclusions, including the reasons for identifying the item.

Interrogatories on Contention 22A (Fuel Cost Estimates)

22A-1. ER Table 8.2.1-1 sets forth components in the fuel cycle costs for the Harris Plant. The four components are as follows:

- (1) Enriched uranium costs (which, in turn, includes uranium costs, conversion costs and enrichment costs);
- (2) Fabrication costs;
- (3) Spent fuel storage and disposal costs; and
- (4) Carrying charges.

Do you contend that there are other components of the Harris fuel costs which are not included in ER Table 8.2.1-1? If so, state what other components you believe should be included, the cost associated with each, and explain in detail the basis for your belief.

22A-2(a). ER Table 8.2.1-1 sets forth the estimated lifetime levelized costs in mill per kilowatt hour for each component of the fuel cycle cost. State in detail which costs, as set forth in Table ER 8.2.1-1, you contend are erroneously low.

(b). For each cost identified in response to (b) above, state what you believe the estimated cost should be and explain in detail the basis for your allegation that the methodology utilized by Applicants for determining the cost of enriched uranium is flawed.

(c). If the answer to (a) above is other than affirmative, state in detail how your response is consistent with the allegation set forth in Contention 22A.

22A-3(a). ER § 8.2.1 states that fabrication cost estimates are based on the contract cost for the initial core for each Harris Unit. Future cost estimates are determined using market prices and are escalated using established indices. Do you contend that Applicants' methodology for establishing the fabrication cost for Harris fuel is flawed?

(b). If the answer to (a) above is affirmative, set forth in detail the basis for your allegation that Applicants' methodology for determining fabrication costs is flawed.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 22A.

22A-4(a). The Nuclear Waste Policy Act of 1982, enacted on January 7, 1983, establishes a fixed fee of 1 mill per kilowatt hour for disposal costs for high-level radioactive waste and spent fuel. This fee will be collected by the Department of Energy on all nuclear generated electricity which is sold after April 7, 1983. Reference 8.2.1-1, listed in the ER, is a study by the Congressional Budget Office which establishes the adequacy of the 1 mill per kilowatt hour charged. Do you contend that Applicants' use of the charge established by Congress as the basis for the estimated cost of spent fuel storage and disposal is incorrect?

(b). If the answer to (a) above is affirmative, set forth in detail the basis for your contention that Applicants' estimate of spent fuel storage and disposal costs is incorrectly determined.

(c). If the answer to (a) above is other than affirmative, explain how your response is consistent with the allegations is set forth in Contention 22A.

22A-5(a). The final component in Applicants' estimate of Harris fuel costs is projection of carrying charges based on established indices supplied by Data Resources Incorporated (DRI). Do you contend that the use of such established indices is a flawed methodology in determining carrying charges?

(b). If the answer to (a) above is affirmative, set forth in detail the basis for your contention that the carrying charges based on established escalation indices are incorrectly determined.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegation set forth in Contention 22A.

Interrogatories on Contention 22B (Operating Payroll)

22B-1. ER § 8.2.1 states that Carolina Power & Light Company expects to spend approximately \$615 million of the total life of the plant operation and maintenance costs in salaries. These salaries are based on Applicants' estimates of all company personnel, both onsite and offsite, and contract

labor required for operation of the Harris Plant. Explain in detail the basis for your allegation that this estimate is not accurate.

22B-2(a). As the basis for your contention that Applicants' estimate of the operating payroll for Harris Units 1 and 2 is not accurate, you allege that the operating payroll estimates have not decreased by any significant amount compared to the estimated operating payroll for four units at the construction permit stage. Do you contend that there has not been a significant increase in staffing needs at all nuclear power plants due to new regulatory requirements instituted since the date of the information provided in the ER, Construction Permit stage?

(b). If the answer to (a) above is affirmative, set forth in detail the basis for your assertion that staffing levels for commercial nuclear power plants have not increased due to the new regulatory requirements during the period of time since the construction permit proceeding for the Harris Nuclear Power Plant.

(c). If the answer to (a) above is other than affirmative, explain in detail why the fact of an increase in the estimated operating payroll since the date of the information provided in the ER, Construction Permit stage, supports your contention that Applicants' present estimate of operating payroll is inaccurate.

Interrogatories on Contention 41 (Defective Hangar Welds)

Interrogatories 41-1(a) through 41-5(e) all relate to Applicants' "Final Report, Weld Symbol Errors and Misapplication of Weld on Bergen-Patterson Pipe Hangers", and to NRC IE Inspection Report 50-400/401/402/403-81-12, attached hereto.

41-1 (a). Do you contend that Applicants failed to take effective corrective action upon discovery of the pipe hangar welding deficiencies?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that Applicants failed to take effective corrective action upon discovery of the pipe hangar welding deficiencies.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 41.

41-2 (a). Do you contend that the additional welding and inspection training and instructions initiated by Applicants following discovery of the pipe hangar welding deficiencies was or will be ineffective in preventing subsequent occurrences of similar deficiencies?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 41.

41-3 (a). Do you contend that the weld rework/repair efforts undertaken by Applicants were inadequate in restoring the welds to an acceptable condition?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 41.

41-4 (a). Do you contend that Applicants improperly accepted any welds without requiring rework, i.e., accepted in the "as-is" condition?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 41.

41-5 (a). Do you contend that the NRC Staff improperly closed out the infraction involving the pipe hangar welding deficiencies by accepting Applicants' corrective action?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 41.

Interrogatories on Contention 45 (Water Hammer)

45-1(a). Do you contend that the design of the Harris Plant feedwater system described in Section 10.4.7.1 of the FSAR is an inadequate design against possible water hammer events?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support this allegation.

(c). If not contained in the answer to Interrogatory 45-1(b), please identify specifically the alleged inadequacies of design and the specific adverse effects of water hammer which allegedly would occur using this design.

(d). If the answer to 45-1(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 45.

45-2(a). Do you contend that the design of the feedwater system described in Section 10.4.7.1 of the FSAR does not comply with any applicable NRC regulation, guidance, report or other applicable NRC document?

(b). If the answer to the preceding interrogatory is affirmative, identify, with citation, each such applicable NRC regulation, guidance, report or other applicable NRC document which supports this allegation.

(c). If the answer to Interrogatory 45-2(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 45.

45-3(a). Do you contend that inspection and testing of the feedwater system will not be adequate with respect to possible water hammer events?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support this allegation.

(c). If the answer to Interrogatory 45-3(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 45.

45-4(a). Do you contend that the design and safety evaluation of the Harris Plant auxiliary feedwater system described in Section 10.4.9 of the FSAR is an inadequate design against possible water hammer events?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support this allegation.

(c). If not contained in the answer to Interrogatory 45-3(b), please identify specifically the alleged inadequacies

of design and the specific adverse effects of water hammer which allegedly would occur using this design.

(d). If the answer to Interrogatory 45-4(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 45.

45-5 (a). Do you contend that the design of the auxiliary feedwater system described in Section 10.4.9 of the FSAR does not comply with any applicable NRC regulation, guidance, report or other applicable NRC document?

(b). If the answer to the preceding interrogatory is affirmative, identify, with citation, each such applicable NRC regulation, guidance, report or other applicable NRC document which supports this allegation.

(c). If the answer to Interrogatory 45-5(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 45.

45-6 (a). Do you contend that the testing and inspections of the auxiliary feedwater system described in Section 10.4.9.4 of the FSAR is inadequate with respect to possible water hammer events?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support this allegation.

(c). If not contained in the answer to Interrogatory 45-5(b) above, please identify specifically the alleged

inadequacies in such testing and inspection and the specific adverse effects of water hammer which allegedly would occur as a result of such alleged inadequacies?

(d). If the answer to Interrogatory 45-6(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 45.

45-7 (a). Do you contend that the testing and inspections of the auxiliary feedwater system described in Section 10.4.7.1 of the FSAR does not comply with any applicable NRC regulation, guidance, report or other applicable NRC document?

(b). If the answer to the preceding interrogatory is affirmative, identify, with citation, each such applicable NRC regulation, guidance, report or other applicable NRC document which supports this allegation.

(c). If the answer to Interrogatory 45-7(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 45.

Interrogatories 45-8(a) through 45-8(c) all relate to Applicants' Response to NRC Review Question 440.49, a copy of which is attached hereto.

45-8 (a). Do you contend that the design of the ECCS piping described by Applicants is inadequate to preclude the effects of water hammer?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support this allegation.

(c). If not contained in the answer to Interrogatory 45-8(b), please identify specifically the alleged inadequacies of design and the specific effects of water hammer which allegedly would occur using this design.

(d). If the answer to Interrogatory 45-8(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 45.

45-9 (a). Do you contend that the design of the main steam system of the Harris Plant is an inadequate design against possible water hammer events?

(b.) If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support this allegation.

(c). If the answer to Interrogatory 45-9(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 45.

45-10(a). Do you contend that inspection and testing of the main steam system will not be adequate with respect to possible water hammer events?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support this allegation.

(c). If the answer to Interrogatory 45-10(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 45.

45-11. In your contention, you refer to the "Plant Water Hammer Experience Report, PWR S.G. (steam generator), feedwater, ECCS & Main Steam System water hammer events evaluation (including systems effect) ... and the CR and NUREG reports on the water hammer question." Please state the exact title and citation of each such report.

Interrogatories on Contention 65 (Defective Base Mat)

65-1 (a). As used herein, a "deficiency" is a minor deviation from a procedure or specification which can be dispositioned on-site by Applicants; a "nonconformance" is a deviation from a procedure or specification, the disposition of which must be approved by the architect/engineer for the Harris Plant. Do you contend that there are deficiencies or nonconformances associated with any of the concrete placements (pours) for the Harris Plant containment building[s] which will prevent those structures from performing their intended function?

(b). If the answer to the preceding interrogatory is affirmative, identify each such alleged deficiency or noncompliance.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 65.

65-2 (a). Do you contend that there are deficiencies or nonconformances associated with the Harris Plant containment building concrete placements for which Applicants have failed to take appropriate corrective measures?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to the preceding interrogatory is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 65.

65-3 (a). Do you contend that the Harris Plant QA/QC program is such that deficiencies or nonconformances associated with the Harris Plant containment building concrete placements could have gone undiscovered?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 65.

65-4. Identify the source of information upon which you base your contention that Daniel International "has a history of building defective base mats and containments (e.g., Callaway, Wolf Creek, Farley)."

65-5. Is your concern regarding the quality of the concrete construction of the Harris Plant containment and base mat based merely on the fact that Daniel International is the contractor for the Harris Plant? If so, have you examined the experience of other contractors for similar problems?

65-6. Identify the main determinants in concrete placements which could lead to the type of concrete deficiencies discussed in your contention (i.e., "voids over 1 inch in size"). Your answer should include a discussion of the influence of the structural steel design in the area of the pour.

65-7. Have you examined the structural steel design and concrete placement reports for the Callaway, Wolf Creek and Farley plants as compared to the Harris Plant? If so, describe any similarities between those plants and the Harris Plant.

65-8 (a). Do you contend that the alleged deficiencies associated with the containment building concrete placements at the Wolf Creek Generating Station were of such a nature as to prevent that structure from properly performing its intended function?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 65.

65-9 (a). Do you contend that structural modifications were required as a result of the alleged deficiencies associated with the containment building concrete placements at the the Wolf Creek Generating Station?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 65.

65-10(a). Do you contend that the alleged deficiencies associated with the containment building concrete placements at the Callaway Plant were of such a nature as to prevent that structure from properly performing its intended function?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to the preceding interrogatory is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 65.

65-11(a). Do you contend that structural modifications were required as a result of the alleged deficiencies associated with the containment building concrete placements at the Callaway Plant?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 65.

65-12(a). Do you contend that the alleged deficiencies associated with the containment building concrete placements at the Joseph M. Farley Nuclear Station were of such a nature as to prevent that structure from properly performing its intended function?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to (a) above is affirmative, do you contend that the NRC acted improperly in issuing an operating license for the Farley plant?

(d). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 65.

65-13(a). Do you contend that structural modifications were required as a result of the alleged deficiencies associated with the containment building concrete placements at the Joseph M. Farley Nuclear Station?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 65.

Interrogatories on Contention 75 (Clams and Marine Growth)

75-1(a). Do you contend that the Harris Plant cooling tower basins are required for safe shutdown or cooldown of the reactors?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that the Harris plant cooling tower basins are required for safe shutdown or cooldown of the reactors.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 75.

75-2. State in detail all the facts which support your allegation that marine growth will possibly prove resistant to biocides. Your answer to this interrogatory should include,

but not be limited to, a list of each and every type (as specific a name or description as possible) of marine growth, and a list of each and every type of biocide to which each marine growth will possibly prove resistant.

75-3(a). Do you contend that Applicants have not taken appropriate measures to control biological fouling of the condenser tubes and circulating water piping?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that Applicants have not taken appropriate measures to control biological fouling of the condenser tubes and circulating water piping.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 75.

75-4(a). Do you contend that Applicants have not taken appropriate measures to reduce or prevent the entry of debris via the water intake?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that Applicants have not taken appropriate measures to reduce or prevent the entry of debris via the water intake.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 75.

75-5(a). Do you contend that Applicants' monitoring program to detect any introduction of asiatic clams into the Harris Reservoir is inadequate?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that Applicants' monitoring program to detect any introduction of asiatic clams into the Harris Reservoir is inadequate.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 75.

75-6(a). Do you contend that Applicants have failed to address or to take appropriate measures to prevent corrosion of the main condensers?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that Applicants have failed to address or to take appropriate measures to prevent corrosion of the main condensers.

75-7(a). Do you contend that Applicants in designing the Harris Plant main condensers have failed to take into account possible pressure changes therein?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that Applicants, in designing the main condensers,

have failed to take into account possible pressure changes therein.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 75.

Interrogatories on Contention 80  
(Mixing and Dispersion Models)

80-1 (a). Do you contend that the mixing models and dispersion models described in Section 5.2.2 of the ER are deficient?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all of the facts which support such allegation, including a detailed explanation of such deficiencies.

(c). If the answer to Interrogatory 80-1(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 80.

80-2 (a). Do you contend that the mixing models and dispersion models described in Section 5.2.2 of the ER take insufficient account of rainout?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support this allegation.

(c). If the answer to Interrogatory 80-2(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 80.

80-3 (a). What do you consider to be the most limiting scenario of radiological release that Applicants ought to have considered?

(b). Are the mixing and dispersion models described in Section 5.2.2 of the ER inadequate for consideration of that scenario?

(c). If the answer to Interrogatory 80-3(b) is affirmative, state in detail all the facts supporting this allegation and explain specifically all alleged inadequacies.

(d). If the answer to Interrogatory 80-3(b) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 80.

80-4 (a). Do you contend that the mixing and dispersion models described in Section 5.2.2 of the ER do not conform to the guidance of NRC Regulatory Guides 1.109 and 1.113?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all of the facts which support this allegation, including a detailed explanation of each way in which the models allegedly do not conform to such Regulatory Guides.

(c). If the answer to Interrogatory 80-4(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 80.

80-5(a). Do you contend that the mixing and dispersion models approved by the NRC in Regulatory Guides 1.109 and 1.113 are deficient?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support this allegation, including a detailed explanation of the ways in which the models approved by the NRC in such Regulatory Guides are deficient.

(c). If the answer to Interrogatory 80-5(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 80.

Interrogatories on Contention 83/84 (Chemical Pollutants)

83/84-1. State in detail all the facts which support your allegation that the discharges into the Harris cooling lake can and will interact to form carcinogenic compounds including  $\text{NCl}_3$ ,  $\text{NHCl}_2$ , and  $\text{NH}_2\text{Cl}$  among others. Your answer to this interrogatory should include, but not be limited to: (1) a list of each and every chemical which you contend will be discharged into the Harris cooling lake which can interact to form carcinogenic compounds; (2) a list of each and every chemical which you contend will be discharged into the Harris cooling lake which will interact to form carcinogenic compounds; (3) a description of the chemical processes which take place in the Harris Plant which you contend will produce each of those discharge chemicals listed by you in answer to (1) and (2) of this interrogatory; (4) the concentration of each and every one of the discharge chemicals listed by you in answer to (1) and (2) of this interrogatory which you contend is required

for interaction to form carcinogenic compounds; and (5) a list of each and every carcinogenic compound which you contend will be formed by such interaction of discharges.

83/84-2(a). For each and every carcinogenic compound listed in your answer to part (5) of the interrogatory above, please provide (1) the magnitude and type of risk you contend each one poses to anyone swimming in the lake and the concentration of each compound which you contend is required to pose such a risk, and (2) the magnitude and type of risk you contend each one poses to anyone eating fish from the lake and the magnitude and the type of concentration of each such compound in the lake food chain which you contend is required to pose such a risk.

(b). State in detail all the facts which support your answer to Interrogatory 83/84(a).

83/84-3. For each and every carcinogenic compound listed in answer to Interrogatory 83/84-1, provide (1) the concentration of each which you contend will be put in the water supply for each and every downriver community which draws water from the Cape Fear River, and (2) the concentration of each which you contend will be put into river food chains and fish stocks (a) in the river, and (b) off the North Carolina coast where the Cape Fear enters the Atlantic Ocean.

83/84-4. State in detail all the facts which support your allegation that substantial amounts of organic chemicals in the Cape Fear River, including dyes and phenol-based chemicals, become more carcinogenic and have reactions with chlorine, ammonia and hydrazine. Your answer should include, but not be limited to, (1) each and every organic chemical, dye and phenol-based chemical in the Cape Fear River that becomes more carcinogenic after reactions with chlorine, ammonia, and hydrazine; (2) for each such chemical named provide the concentration of chlorine, ammonia, and hydrazine which you contend is required for a reaction which would cause that chemical to become more carcinogenic; and (3) a specific description of the chemical reaction itself which you contend will cause each such chemical to become more carcinogenic, including a list of each and every carcinogenic chemical which you contend will result from reactions of organic chemicals, dyes and phenol-based chemicals in the Cape Fear River with chlorine, ammonia and hydrazine.

83/84-5. Please describe in detail the manner of testing for organic chemicals, dyes and phenol-based chemicals in North Carolina river waters which you would consider "adequate".

83/84-6. State in detail all the facts, other than those contained in your contention, which support your allegation that neither Applicants nor anyone else has considered the

actual levels of numerous organic carcinogens in Cape Fear water, nor considered the interaction of these carcinogens and other chemicals with Harris Plant discharges and consequences thereof.

83/84-7. State in detail all the facts which support your allegation that interaction of Harris Plant discharges with metals contained in the Haw and Cape Fear Rivers will chemically mobilize those metals so they will be more readily absorbed by living creatures in the food chain in the Cape Fear River areas and Atlantic Ocean near the Cape Fear River discharge point. Your answer to this interrogatory should include, but not be limited to, (1) a description of what is meant by your use of the term "mobilize", (2) a list of each and every Harris Plant discharge chemical which you contend will mobilize chemicals in the Haw and Cape Fear Rivers; (3) each and every chemical in the Haw and Cape Fear Rivers which you contend will be mobilized by interaction with Harris Plant discharge chemicals; (4) the manner in which you contend this mobilization will take place, including specific chemical reactions, and the concentration of each and every such chemical listed in answer to (2) and (3) above required for such mobilization to take place; and (5) a list of each and every living creature in the Cape Fear and Atlantic Ocean food chains (at the Cape Fear mouth) which you contend will more readily absorb such chemicals once mobilized.

83/84-8. For each and every mobilized toxic metal identified by you in answer to the interrogatory above, state in detail all the facts which support your allegation that Applicants have not properly analyzed or taken into account the health effects of that particular metal in drinking water, washing water, bathing water and food on humans.

Interrogatories on Contention 132 (Reactor  
Vessel Level Instrumentation System)

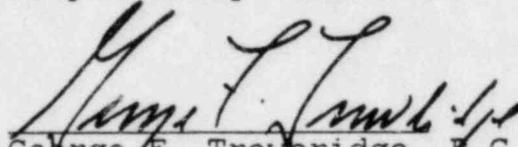
132-1. Westinghouse has developed a Reactor Vessel Level Instrumentation System ("RVLIS"), suitable for installation in operating plants and plants under construction, to meet the recommendation of Item II.F.2 of NUREG-0737 (TMI Action Plan) for additional instrumentation to detect inadequate core cooling. The RVLIS is designed to provide a relatively simple and straight forward means to monitor the water level in the reactor vessel, and serves to provide additional information to the operator during accident conditions. The RVLIS utilizes differential pressure (d/p) measuring devices to indicate water level and relative void content of the circulating primary coolant system fluid. The NRC Staff's review, which accepts the Westinghouse RVLIS, is reported in NUREG-CR-2628. If Applicants commit to install the Westinghouse RVLIS at SHNPP, is your Contention 132 satisfied? If not, explain in detail the basis for the answer.

132-2. If Applicants commit to install the Westinghouse RVLIS at SHNPP, will you voluntarily withdraw Contention 132? If not, explain in detail the basis for the answer.

REQUEST FOR PRODUCTION OF DOCUMENTS

Applicants request that Intervenor Wells Eddleman respond in writing to this request for production of documents and produce the original or best copy of each of the documents identified or described in the answers to each of the above interrogatories, at a place mutually convenient to the parties.

Respectfully submitted,



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Dated: January 31, 1983

demand in regulated fresh channels is expected to require about 56 percent of this volume. The remaining 44 percent would be available for utilization in export and processing outlets. The committee indicates that volume and size composition of the crop of navels are such that more than ample supplies of the more desirable larger sizes will be available to satisfy the demand in regulated channels. The committee also reports that when more than ample supplies of larger sizes are available for shipment, disposition of the sizes which would be eliminated by this regulation can be accomplished only at a substantial price discount and this tends to depress the market for all sizes. Navel oranges failing to meet such requirements could be shipped to fresh export markets, left on trees to attain further growth, or utilized in processing. In those circumstances, elimination of sizes smaller than those specified is appropriate in the interest of producers and consumers.

It is further found that it is impracticable and contrary to the public interest to give preliminary notice, engage in public rulemaking, and postpone the effective date until 30 days after publication in the *Federal Register* (5 U.S.C. 533), because of insufficient time between the date when information became available upon which this regulation is based and the effective date necessary to effectuate the declared purposes of the act. Interested persons were given an opportunity to submit information and views on the regulation at an open meeting. Handlers have been apprised of such provisions and the effective date.

#### List of Subjects in 7 CFR Part 907

Marketing agreements and orders, California, Arizona, Oranges (Navel).

#### PART 907—(AMENDED)

Therefore, § 907.860 is added to read as follows: (§ 907.860 expires March 24, 1983, and will not be published in the annual code of Federal Regulations):

##### § 907.860 Navel orange regulation 560.

(a) During the period January 21, 1983, through March 24, 1983, no handler shall handle any navel oranges grown in the production area which are of a size smaller than 2.32 inches in diameter. *Provided*, that not to exceed 5 percent, by count, of the oranges in any container may measure smaller than 2.32 inches in diameter.

(b) As used in this section, "handler", "handle" and "production area" mean the same as defined in the marketing order. Diameter shall mean the largest

measurement at a right angle to a straight line running from the stem to the blossom end of the fruit.

(Secs. 1-19, 48 Stat. 31, as amended; 7 U.S.C. 601-674)

Dated: January 17, 1983.

D. S. Kuryloski,  
*Deputy Director, Fruit and Vegetable  
Division, Agricultural Marketing Service.*

[FR Doc. 83-1592 Filed 1-20-83; 8:46 am]

BILLING CODE 3410-02-46

#### 7 CFR Part 910

[Lemon Reg. 395]

#### Lemons Grown in California and Arizona Limitation of Handling

**AGENCY:** Agricultural Marketing Service, USDA.

**ACTION:** Final rule.

**SUMMARY:** This regulation establishes the quantity of fresh California-Arizona lemons that may be shipped to market during the period January 23-29, 1983. Such action is needed to provide for orderly marketing of fresh lemons for the period due to the marketing situation confronting the lemon industry.

**EFFECTIVE DATE:** January 23, 1983.

**FOR FURTHER INFORMATION CONTACT:** William J. Doyle, Chief, Fruit Branch, F&V, AMS, USDA, Washington, D.C. 20250, telephone 202-447-5975.

**SUPPLEMENTARY INFORMATION:** This final rule has been reviewed under Secretary's Memorandum 1512-1 and Executive Order 12291, and has been designated a "non-major" rule. William T. Manley, Deputy Administrator, Agricultural Marketing Service, has determined that this action will not have a significant economic impact on a substantial number of small entities. This action is designed to promote orderly marketing of the California-Arizona lemon crop for the benefit of producers, and will not substantially affect costs for the directly regulated handlers.

This final rule is issued under Marketing Order No. 910, as amended (7 CFR Part 910; 47 FR 50196), regulating the handling of lemons grown in California and Arizona. The order is effective under the Agricultural Marketing Agreement Act of 1937, as amended (7 U.S.C. 601-674). The action is based upon recommendations and information submitted by the Lemon Administrative Committee and upon other available information. It is hereby found that this action will tend to effectuate the declared policy of the Act.

This action is consistent with the marketing policy for 1982-83. The

marketing policy was recommended by the committee following discussion at a public meeting on July 6, 1982. The committee met again publicly on January 18, 1983, at Los Angeles, California, to consider the current and prospective conditions of supply and demand and recommended a quantity of lemons deemed advisable to be handled during the specified week. The committee reports the demand for lemons continues easier.

It is further found that it is impracticable and contrary to the public interest to give preliminary notice, engage in public rulemaking, and postpone the effective date until 30 days after publication in the *Federal Register* (5 U.S.C. 533), because of insufficient time between the date when information became available upon which this regulation is based and the effective date necessary to effectuate the declared purposes of the Act. Interested persons were given an opportunity to submit information and views on the regulation at an open meeting. It is necessary to effectuate the declared purposes of the Act to make these regulatory provisions effective as specified, and handlers have been apprised of such provisions and the effective time.

#### List of Subjects in 7 CFR Part 910

Marketing agreements and orders, California, Arizona, Lemons.

#### PART 910—(AMENDED)

Section 910.695 is added as follows:

##### § 910.695 Lemon Regulation 395.

The quantity of lemons grown in California and Arizona which may be handled during the period January 23, 1983, through January 29, 1983, is established at 180,000 cartons.

(Secs. 1-19, 48 Stat. 31, as amended; 7 U.S.C. 601-674)

Dated: January 20, 1983.

D. S. Kuryloski,  
*Deputy Director, Fruit and Vegetable  
Division, Agricultural Marketing Service.*

[FR Doc. 83-1905 Filed 1-20-83; 11:49 am]

BILLING CODE 3410-02-46

#### NUCLEAR REGULATORY COMMISSION

##### 10 CFR Part 50

**Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Final rule.

**SUMMARY:** The Commission is amending its regulations applicable to nuclear power plants to clarify and strengthen the criteria for environmental qualification of electric equipment important to safety. Specific qualification methods currently contained in national standards, regulatory guides, and certain NRC publications for equipment qualification have been given different interpretations and have not had the legal force of an agency regulation. This amendment codifies the environmental qualification methods and criteria that meet the Commission's requirements in this area.

**EFFECTIVE DATE:** February 22, 1983.

**FOR FURTHER INFORMATION CONTACT:** Satish K. Aggarwal, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Telephone (301) 443-6946.

**SUPPLEMENTARY INFORMATION:****Previous Notice**

On January 20, 1982, NRC published in the *Federal Register* a notice of proposed rulemaking on environmental qualification of electric equipment for nuclear power plants (47 FR 2878). The comment period expired March 22, 1982. A total of 89 comment letters raising 10 major issues were received by April 6, 1982. An additional 10 comment letters were received by April 21, 1982, but no new issues were raised. The major issues are discussed below.

**Nature and Scope of the Rulemaking**

Nuclear power plant equipment important to safety must be able to perform its safety functions throughout its installed life. This requirement is embodied in General Design Criteria 1, 2, 4, and 23 of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities"; in Criterion III, "Design Control," and Criterion XI, "Test Control," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50; and in paragraph 50.55a(h) of 10 CFR Part 50, which incorporates by reference IEEE 279-1971.<sup>1</sup> "Criteria for Protection Systems for Nuclear Power Generating Stations." This requirement is applicable to equipment located inside as well as outside the containment.

<sup>1</sup>Incorporation by reference approved by the Director of the Office of Federal Register on January 1, 1982. Copies may be obtained from the Institute of Electrical and Electronics Engineers, Inc., 345 East 47th Street, New York, N.Y. 10017.

The NRC has used a variety of methods to ensure that these general requirements are met for electric equipment important to safety. Prior to 1971, qualification was based on the fact that the electric components were of high industrial quality. For nuclear plants licensed to operate after 1971, qualification was judged on the basis of IEEE 323-1971. For plants whose Safety Evaluation Reports for construction permits were issued since July 1, 1974, the Commission has used Regulatory Guide 1.89, "Qualification of Class 1E Equipment for Light-Water-Cooled Nuclear Power Plants," which endorses IEEE 323-1974.<sup>2</sup> "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations," subject to supplementary provisions.

Currently, the Commission has under way a program to reevaluate the qualification of electric equipment in all operating nuclear power plants. As a part of this program, more definitive criteria for environmental qualification of electric equipment important to safety have been developed by the NRC. A document entitled "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors" (DOR Guidelines) was issued in November 1979. In addition, the NRC has issued NUREG-0588, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," which contains two sets of criteria: the first for plants originally reviewed in accordance with IEEE 323-1971 and the second for plants reviewed in accordance with IEEE 323-1974.

By its Memorandum and Order CLI-80-21 dated May 23, 1980, the Commission directed the staff to proceed with a rulemaking on environmental qualification of safety-related equipment and to address the question of backfit. The commission also directed that the DOR Guidelines and NUREG-0588 form the basis for the requirements licensees and applicants must meet until the rulemaking has been completed. This rule is based on the DOR Guidelines and NUREG-0588. The Commission recognizes the qualification efforts of the industry as a result of CLI-80-21. Therefore, the rule provides that requalification of electric equipment will not be required by applicants for and holders of operating licenses for nuclear power plants previously required by NRC to qualify equipment in accordance with DOR Guidelines or NUREG-0588 (Category I or II). Category I

<sup>2</sup>Copies may be obtained from the Institute of Electrical and Electronics Engineers, Inc., 345 East 47th Street, New York, N.Y. 10017.

requirements of NUREG-0588, which supplement the recommendations of and apply to equipment qualified in accordance with IEEE 323-1974, apply to nuclear power plants for which the construction permit safety evaluation report was issued after July 1, 1974. Category II requirements, which supplement the recommendations of and apply to equipment qualified in accordance with IEEE 323-1971, apply to nuclear power plants for which the construction permit safety evaluation report was issued prior to July 1, 1974.

In CLI-80-21, the Commission stated that unless there were sound reasons to the contrary, replacement parts should be qualified to the standards set forth in Category I of NUREG-0588 or IEEE 323-1974. The Commission reaffirms that position in this rulemaking. Such qualification constitutes compliance with the provisions of paragraph 50.49(1). The Commission's position is designed to promote the policy of upgrading the environmental qualification and reliability of installed electric equipment. Situations may arise, however, in which such upgrading will not be feasible or compatible with overall plant safety. Licensee must review each situation on a case-by-case basis to determine that "sound reasons to the contrary" do exist to justify an exception from upgrading. Examples of acceptable "sound reasons to the contrary" will be included in Regulatory Guide 1.89.

The dates specified in this rule for completion of environmental qualification of electric equipment important to safety apply to all licensees and applicants and supersede any date previously imposed. No changes to licenses or technical specifications are necessary to reflect these new completion dates.

The scope of the final rule covers that portion of equipment important to safety commonly referred to as "safety-related" (which the Commission interprets as essentially "Class 1E" equipment defined in IEEE 323-1974), and nonsafety-related electric equipment whose failure under postulated environmental conditions could prevent the satisfactory accomplishment of required safety functions by safety-related equipment. Safety-related structures, systems, and components are those that are relied upon to remain functional during and following design basis events to ensure (i) the integrity of the reactor coolant pressure boundary, (ii) the capability to shut down the reactor and maintain it in a safe shutdown condition, and (iii) the capability to prevent or mitigate the

consequences of accidents that could result in potential offsite exposures comparable to the guidelines of 10 CFR Part 100. Design basis events are defined as conditions of normal operation, including anticipated operational occurrences; design basis accidents; external events; and natural phenomena for which the plant must be designed to ensure functions (i) through (iii) above. Also covered in the scope of the final rule is certain postaccident monitoring equipment specified as "Category 1 and 2," in Revision 2 of Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident."

Included in the final rule are specific technical requirements pertaining to (a) qualification parameters, (b) qualification methods, and (c) documentation. Qualification parameters include temperature, pressure, humidity, radiation, chemicals, and submergence. Qualification methods include (a) testing as the principal means of qualification and (b) analysis in combination with partial type test data or operating experience. The final rule requires that the qualification program include synergistic effects, radiation, environmental conditions and margin considerations. Also, a record of qualification must be maintained. Proposed Revision 1 to Regulatory Guide 1.89, which has been issued for public comment, describes methods acceptable to the NRC for meeting the provisions of this rule and includes a list of typical equipment covered by it. Revision 1 to Regulatory Guide 1.89 will be issued after resolution of public comments.

NRC will generally not accept analysis alone in lieu of testing. Experience has shown that qualification of equipment without test data may not be adequate to demonstrate functional operability during design basis event conditions. Paragraph 50.49(f) provides four methods for qualification. Testing will be preferred. To ensure integrity of a testing program, the Commission expects that the same piece of equipment will be used throughout the complete test sequence.

The final rule requires that each holder of an operating license provide a list of electric equipment important to safety within the scope of this rule previously qualified based on testing, analysis, or a combination thereof, and a list of equipment that has not been qualified. These lists and the schedule for completion of qualification of electric

equipment must be submitted by May 20, 1983.

The general requirements for seismic and dynamic qualification for electric equipment are contained in the General Design Criteria and are not included within the scope of this rule. Further guidance is provided in Regulatory Guide 1.100, "Seismic Qualification of Electric Equipment for Nuclear Power Plants," (Revision 1) and NUREG-0800, "Standard Review Plan." NRC is considering future rulemaking concerning requirements for the environmental qualification of electric equipment important to safety and the requirements for seismic and dynamic qualification of electric equipment.

#### Comments On The Proposed Rule

The Commission received and considered the comments on the proposed rule contained in the 69 letters received from the public by April 6, 1982. Copies of those letters and a staff response to each comment are available for public inspection and copying for a fee at the Commission's Public Document Room at 1717 H Street NW., Washington, D.C.

The major issues raised by the comments and NRC staff responses are as follows:

#### (1) Seismic and Dynamic Qualification—Paragraph 50.49(c)

**Issue:** Seismic and dynamic qualifications are an integral part of environmental qualification. It is therefore inappropriate to codify these requirements separately.

**Response:** Electric equipment at operating nuclear power plants was generally qualified for environmental and seismic stresses separately, i.e., by using separate prototypes for environmental and seismic qualification tests. The Commission has decided, after considerable deliberation, to pursue the issue of seismic and dynamic qualification separately at a future date. A future seismic rule may not require retesting for environmental stresses because a single prototype was not used during the original qualification. Also, the Commission has concluded that protection of electric equipment important to safety against other natural phenomena and external events should not be within the scope of this rule.

#### (2) Scope—Cold Shutdown Requirement—Paragraph 50.49(b)

**Issue:** The rule introduces a new requirement to qualify "equipment needed to complete one path of achieving and maintaining a cold shutdown condition." A change of this magnitude, at this advanced stage of the

industry's qualification effort, most certainly introduces significant new costs and obligations with no demonstrated improvement in safety.

**Response:** Regulatory requirements in effect at the time of licensing of the majority of operating reactors did not require that all electric equipment and systems necessary to bring the reactor to cold shutdown be classified as safety related. However, electric equipment and systems necessary to shut down the reactor and maintain it in a safe shutdown condition are required to be classified as safety related and therefore are covered by the rule.

The Commission is currently studying the requirements for shutdown decay heat removal under Unresolved Safety Issue (USI) A-45. The overall purpose of A-45 is to evaluate the adequacy of current licensing requirements to ensure that failure to remove shutdown decay heat does not pose an unacceptable risk. Under A-45 a comprehensive and consistent set of shutdown cooling requirements for existing and future plants is being developed. The final technical resolution of A-45 is presently scheduled for October 1984.

The Commission believes it would be premature at this time to impose the requirement to environmentally qualify electric equipment and systems necessary to achieve and maintain cold shutdown prior to the final resolution of A-45. Therefore, this requirement is not included in the final rule.

#### (3) Scope—Equipment in a Mild Environment—Paragraph 50.49(b)

**Issue:** The rule makes no distinction between equipment located in a harsh or mild environment. The stresses for equipment in a mild environment are less severe than for those in a harsh environment.

**Response:** The final rule does not cover the electric equipment located in a mild environment. The Commission has concluded that the general quality and surveillance requirements applicable to electric equipment as a result of other Commission regulations, including 10 CFR Part 50, Appendix B (see for example, Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 3) are sufficient to ensure adequate performance of electric equipment important to safety located in mild environments. Since it has been concluded that no further environmental qualification requirements are needed for such equipment provided they fully satisfy all other applicable regulations, the Commission has determined that no additional requirements are necessary

with respect to electric equipment important to safety located in mild environments in order for licensees to satisfy, with respect to such equipment, existing license conditions or technical specifications calling for qualification of safety-related electric equipment in accordance with DOR Guidelines or NUREG-0588.

*(4) Scope—Previous Qualification Efforts—Paragraph 50.49(b)*

**Issue:** The rule does not recognize that plants have completed qualification of equipment to the DOR Guidelines or NUREG-0588. Without such recognition, industry efforts, manpower, and billions of dollars will go down the drain.

**Response:** The final rule has been expanded to alleviate this concern. See Paragraph 50.49(k).

*(5) Humidity—Paragraph 50.49(e)(2)*

**Issue:** The effects of time-dependent variations of relative humidity during normal operation cannot be considered for all equipment. There are no detailed standards for how this type of testing should be performed.

**Response:** The Commission agrees. Humidity variation during normal operation are difficult to predict. It has not been demonstrated that the time-dependent variation in humidity will produce any differences in degradation of electric equipment. The words "Time-dependent variation of relative" have been deleted from Paragraph 50.49(e)(2).

*(6) Aging—Paragraph 50.49(e)(5)*

**Issue:** This requirement that ongoing qualifications be done using "prototype equipment naturally aged" is overly restrictive. Use of accelerated aging to define a qualified life is not technically feasible.

**Response:** Preconditioning by accelerated aging is technically feasible for simple electric equipment for plant life and for complex electric equipment for a shorter designated life. The Commission recognizes that state-of-art technology will be utilized in any aging program. Reference to qualified life has been deleted from paragraph 50.49(e)(5).

*(7) Margins—Paragraph 50.49(e)(8)*

**Issue:** The margins applied in addition to known conservatism lead to excessive stress that could lead to failures of equipment in unrealistic qualification tests.

**Response:** The Commission agrees. This requirement could have caused excessive margins. The paragraph has been modified to recognize conservatism that can be qualified.

*(8) Analysis and partial test data—Paragraph 50.49(f)(4)*

**Issue:** If partial type test data that adequately support the analytical assumptions and conclusions are available, their analysis should be allowed to extrapolate or interpolate these results for equipment, regardless of purchase date.

**Response:** The Commission agrees. Reference to "purchase date" has been deleted.

*(9) Requirement for a central file—Paragraph 50.49(j)*

**Issue:** The requirement for a central file should be deleted since it is not cost effective and has no safety benefit.

**Response:** The Commission agrees. This requirement has been subject to different interpretations. A record of qualification must be maintained in an "auditable form" but not necessarily in a central file for the entire period during which the covered item is installed in a nuclear power plant. Recordkeeping requirement of 10 CFR Part Appendix B must be met. Certain records can be kept at the vendor's shop.

*(10) Justification of continued operation for operating plants.*

**Issue:** The requirement to submit justification for the continued operation of operating plants should be deleted since this information has been previously submitted to NRC.

**Response:** This requirement has been satisfactorily met and Paragraph 50.49(j) of the proposed rule has been deleted in its entirety from the final rule.

In addition, Paragraph 50.49(g) of the proposed rule has been deleted from the final rule since it is too prescriptive. It will be included in Regulatory Guide 1.89.

**Effective Date:** This rule replaces the "interim rule" published in the *Federal Register* on June 30, 1982 (47 FR 28363). The "interim rule" suspended environmental qualification deadlines contained in license conditions or technical specifications of operating plants. On the effective date of this rule (see above), the "interim rule" is superseded and the schedule for environmental qualification contained in this rule takes effect for all plants.

**Paperwork Reduction Act**

The final rule contains information collection requirements that have been approved by the Office of Management and Budget; OMB approval number is 3150-0011.

**Regulatory Flexibility Statement**

In accordance with the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b),

the Commission hereby certifies that this rule will not have a significant economic impact on a substantial number of small entities. This final rule affects the method of qualification of electric equipment by utilities. Utilities do not fall within the definition of a small business found in Section 3 of the Small Business Act, 15 U.S.C. 632.

In addition, utilities are required by the Commission's Memorandum and Order CLI-80-21, dated May 23, 1980, to meet the requirements contained in the DOR "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors," (November 1979) and NUREG-0588, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," which form the basis of this rule. Consequently, this rule codifies existing requirements and imposes no new costs or obligations on utilities.

**List of Subjects in 10 CFR Part 50**

Antitrust, Classified information, Fire prevention, Intergovernmental relations, Nuclear power plants and reactors, Penalty, Radiation protection, Reactor siting criteria, Reporting requirements.

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended and section 553 of title 5 of the United States Code, 10 CFR Part 50 is amended as follows:

**PART 50—(AMENDED)**

1. The authority citation for Part 50 continues to read as follows:

**Authority:** Secs. 103, 104, 161, 182, 183, 186, 189, 68 Stat. 936, 937, 948, 953, 954, 955, 956, as amended, sec. 234, 83 Stat. 1244, as amended (42 U.S.C. 2133, 2134, 2201, 2232, 2233, 2236, 2239, 2282); secs. 201, 202, 206, 68 Stat. 1242, 1244, 1246, as amended (42 U.S.C. 5841, 5842, 5846), unless otherwise noted.

Section 50.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851). Section 50.78 also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Sections 50.80-50.81 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Sections 50.100-50.102 also issued under sec. 186, 68 Stat. 955 (42 U.S.C. 2236).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273), §§ 50.10(a), (b), and (c), 50.44, 50.46, 50.48, 50.54, and 50.80(a) are issued under sec. 181b, 68 Stat. 948, as amended (42 U.S.C. 2201(b)); §§ 50.10(b) and (c) and 50.54 are issued under sec. 181i, 68 Stat. 949, as amended (42 U.S.C. 2201(i)); and §§ 50.55(e), 50.59(b), 50.70, 50.71, 50.72, and 50.78 are issued under sec. 181o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

2. Section 50.49 is revised to read as follows:

§ 50.49 Environmental qualification of electric equipment important to safety for nuclear power plants.

(a) Each holder of or each applicant for a license to operate a nuclear power plant shall establish a program for qualifying the electric equipment defined in paragraph (b) of this section.

(b) Electric equipment important to safety covered by this section is:

(1) Safety-related electric equipment:<sup>3</sup> This equipment is that relied upon to remain functional during and following design basis events to ensure (i) the integrity of the reactor coolant pressure boundary, (ii) the capability to shut down the reactor and maintain it in a safe shutdown condition, and (iii) the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to the 10 CFR Part 100 guidelines. Design basis events are defined as conditions of normal operation, including anticipated operational occurrences, design basis accidents, external events, and natural phenomena for which the plant must be designed to ensure functions (i) through (iii) of this paragraph.

(2) Nonsafety-related electric equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions specified in subparagraphs (i) through (iii) of paragraph (b)(1) of this section by the safety-related equipment.

(3) Certain post-accident monitoring equipment.<sup>4</sup>

(c) Requirements for (i) dynamic and seismic qualification of electric equipment important to safety, (ii) protection of electric equipment important to safety against other natural phenomena and external events, and (iii) environmental qualification of electric equipment important to safety located in a mild environment are not included within the scope of this section. A mild environment is an environment that would at no time be significantly more severe than the environment that would occur during normal plant operation, including anticipated operational occurrences.

<sup>3</sup> Safety-related electric equipment is referred to as "Class 1E" equipment in IEEE 323-1974. Copies of this standard may be obtained from the Institute of Electrical and Electronics Engineers, Inc., 345 East 47th Street, New York, NY 10017.

<sup>4</sup> Specific guidance concerning the types of variables to be monitored is provided in Revision 2 of Regulatory Guide 1.97, "Instrumentation for Light-Water Cooled Nuclear Power Plants to Assess Plant and Environ. Conditions During and Following an Accident." Copies of the Regulatory Guide can be obtained from Nuclear Regulatory Commission, Document Management Branch, Washington, DC 20555.

(d) The applicant or licensee shall prepare a list of electric equipment important to safety covered by this section. In addition, the applicant or licensee shall include the following information for this electric equipment important to safety in a qualification file:

(1) The performance specifications under conditions existing during and following design basis accidents.

(2) The voltage, frequency, load, and other electrical characteristics for which the performance specified in accordance with paragraph (d)(1) of this section can be ensured.

(3) The environmental conditions, including temperature, pressure, humidity, radiation, chemicals, and submergence at the location where the equipment must perform as specified in accordance with paragraphs (d)(1) and (2) of this section.

(e) The electric equipment qualification program must include and be based on the following:

(1) *Temperature and Pressure.* The time-dependent temperature and pressure at the location of the electric equipment important to safety must be established for the most severe design basis accident during or following which this equipment is required to remain functional.

(2) *Humidity.* Humidity during design basis accidents must be considered.

(3) *Chemical Effects.* The composition of chemicals used must be at least as severe as that resulting from the most limiting mode of plant operation (e.g., containment spray, emergency core cooling, or recirculation from containment sump). If the composition of the chemical spray can be affected by equipment malfunctions, the most severe chemical spray environment that results from a single failure in the spray system must be assumed.

(4) *Radiation.* The radiation environment must be based on the type of radiation, the total dose expected during normal operation over the installed life of the equipment, and the radiation environment associated with the most severe design basis accident during or following which the equipment is required to remain functional, including the radiation resulting from recirculating fluids for equipment located near the recirculating lines and including dose-rate effects.

(5) *Aging.* Equipment qualified by test must be preconditioned by natural or artificial (accelerated) aging to its end-of-installed life condition. Consideration must be given to all significant types of degradation which can have an effect on the functional capability of the

equipment. If preconditioning to an end-of-installed life condition is not practicable, the equipment may be preconditioned to a shorter designated life. The equipment must be replaced or refurbished at the end of this designated life unless ongoing qualification demonstrates that the item has additional life.

(6) *Submergence* (if subject to being submerged).

(7) *Synergistic Effects.* Synergistic effects must be considered when these effects are believed to have a significant effect on equipment performance.

(8) *Margins.* Margins must be applied to account for unquantified uncertainty, such as the effects of production variations and inaccuracies in test instruments. These margins are in addition to any conservatism applied during the derivation of local environmental conditions of the equipment unless these conservatisms can be quantified and shown to contain appropriate margins.

(f) Each item of electric equipment important to safety must be qualified by one of the following methods:

(1) Testing an identical item of equipment under identical conditions or under similar conditions with a supporting analysis to show that the equipment to be qualified is acceptable.

(2) Testing a similar item of equipment with a supporting analysis to show that the equipment to be qualified is acceptable.

(3) Experience with identical or similar equipment under similar conditions with a supporting analysis to show that the equipment to be qualified is acceptable.

(4) Analysis in combination with partial type test data that supports the analytical assumptions and conclusions.

(g) Each holder of an operating license issued prior to February 22, 1983, shall, by May 20, 1983, identify the electric equipment important to safety within the scope of this section already qualified and submit a schedule for either the qualification to the provisions of this section or for the replacement of the remaining electric equipment important to safety within the scope of this section. This schedule must establish a goal of final environmental qualification of the electric equipment within the scope of this section by the end of the second refueling outage after March 31, 1982 or by March 31, 1985, whichever is earlier. The Director of the Office of Nuclear Reactor Regulatory may grant requests for extensions of this deadline to a date no later than November 30, 1985, for specific pieces of equipment if these requests are filed on

a timely basis and demonstrate good cause for the extension, such as procurement lead time, test complications, and installation problems. In exceptional cases, the Commission itself may consider and grant extensions beyond November 30, 1985, for completion of environmental qualification.

(h) Each licensee shall notify the Commission of any significant equipment qualification problem that may require extension of the completion date provided in accordance with paragraph (g) of this section within 60 days of its discovery.

(i) Applicants for operating licenses that are to be granted on or after February 22, 1983, but prior to November 30, 1985, shall perform an analysis to ensure that the plant can be safely operated pending completion of equipment qualification required by this section. This analysis must be submitted to the Director of the Office of Nuclear Reactor Regulation for consideration prior to the granting of an operating license and must include, where appropriate, consideration of:

(1) Accomplishing the safety function by some designated alternative equipment if the principal equipment has not been demonstrated to be fully qualified.

(2) The validity of partial test data in support of the original qualification.

(3) Limited use of administrative controls over equipment that has not been demonstrated to be fully qualified.

(4) Completion of the safety function prior to exposure to the accident environment resulting from a design basis event and ensuring that the subsequent failure of the equipment does not degrade any safety function or mislead the operator.

(5) No significant degradation of any safety function or misleading information to the operator as a result of failure of equipment under the accident environment resulting from a design basis event.

(j) A record of the qualification, including documentation in paragraph (d) of this section, must be maintained in an auditable form for the entire period during which the covered item is installed in the nuclear power plant or is stored for future use to permit verification that each item of electric equipment important to safety covered by this section—

(1) Is qualified for its application; and  
(2) Meets its specified performance requirements when it is subjected to the conditions predicted to be present when it must perform its safety function up to the end of its qualified life.

(k) Applicants for and holders of operating licenses are not required to requalify electric equipment important to safety in accordance with the provisions of this section if the Commission has previously required qualification of that equipment in accordance with "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors," November 1979 (DOR Guidelines), or NUREG-0588 (For Comment version), "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment."

(l) Replacement equipment must be qualified in accordance with the provisions of this section unless there are sound reasons to the contrary.

Dated at Washington, D.C. this 17th day of January, 1983.

For the Nuclear Regulatory Commission,

Samuel J. Chilk,

Secretary of the Commission.

[FR Doc. 83-1722 Filed 1-20-83; 9:46 am]

BILLING CODE 7829-01-M

## COMMODITY FUTURES TRADING COMMISSION

17 CFR Parts 140 and 145

Commission Headquarters Office and Western and Southwestern Regional Offices; Change of Address

AGENCY: Commodity Futures Trading Commission.

ACTION: Final rule amendments.

**SUMMARY:** The Commodity Futures Trading Commission is amending its regulations in an attempt to clarify that both the physical location and the mailing address of the Commission's headquarters office are one and the same for all practical purposes. In addition, the Commission is amending its regulations to include new addresses for its recently relocated Western and Southwestern regional offices. The Western Regional office has been moved from San Francisco to Los Angeles, California. The Southwestern Regional office, located in Kansas City, Missouri, has moved to a different suite of offices in the same building.

**EFFECTIVE DATE:** January 21, 1983.

**FOR FURTHER INFORMATION CONTACT:** Donald L. Tendick, Acting Executive Director, Commodity Futures Trading Commission, 2033 K Street NW., Washington, D.C. 20581, (202) 254-7556.

**SUPPLEMENTARY INFORMATION:** Commission regulation § 140.1 currently provides a separate physical location and mailing address for the

Commission's headquarters office. The Commission is amending regulation § 140.1 to clarify that there is no meaningful distinction between its physical location and mailing address. The sole address of the Commission's headquarters office as of January 18, 1983 will be 2033 K Street, N.W., Washington, D.C. 20581.

The Commission is amending regulation 140.2 to reflect the fact that the Western Regional office of the Commission has moved from San Francisco to 10850 Wilshire Boulevard, Suite 510, Los Angeles, California 90024. The telephone number for general information is (213) 209-8783. In addition, regulation § 140.2 is being amended to note the Southwestern Regional office has moved from Room 208 to Suite 400 at 4901 Main Street, Kansas City, Missouri 64112. The telephone number for general information remains (816) 374-5425.

Certain other provisions of the Commission's regulations contain references to or addresses of the Commission's Western and Southwestern Regional offices. The appropriate changes have been made to reflect the new addresses in each of these provisions.

Based on the foregoing, pursuant to its authority contained in section 2(a)(11) of the Commodity Exchange Act, 7 U.S.C. 4a(j) (1978), the Commission hereby amends Parts 140 and 145 of the Code of Federal Regulations as follows:

### PART 140—[AMENDED]

1. Section 140.1 is revised to read as follows:

#### § 140.1 Headquarters Office.

(a) *General.* The headquarters office of the Commission is located at 2033 K Street, NW., Washington, D.C. 20581.

2. Section 140.2 is amended by revising paragraphs (c) and (d) to read as follows:

#### § 140.2 Region offices—Regional Offices.

(c) The Western Regional office is located at 10850 Wilshire Boulevard, Suite 510, Los Angeles, California 90024, and is responsible for enforcement of the Act and administration of the programs of the Commission in the States of Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

(d) The Southwestern Regional office is located at 4901 Main Street, Suite 400, Kansas City, Missouri 64112, and is responsible for enforcement of the Act


**CP&L**

Carolina Power &amp; Light Company

Raleigh, N. C. 27602

**COPY**

Mr. James P. O'Reilly  
 United States Nuclear Regulatory Commission  
 Region II  
 101 Marietta Street, Northwest  
 Atlanta, Georgia 30303

SHEARON HARRIS NUCLEAR POWER PLANT  
 UNIT 1  
 DOCKET NO. 50-400  
 WELD SYMBOL ERRORS AND MISAPPLICATION  
 OF WELD ON BERGEN-PATERSON  
 PIPE HANGERS  
(NRC INFRACTION 400/80-22-01)

Dear Mr. O'Reilly:

In accordance with 10CFR50.55(e), a final report on the subject deficiency was forwarded to you on May 1, 1981. Attached is Revision 1 to that report reflecting certain editorial changes. Pages revised are:

- i) Page 4
- ii) Exhibit No. 2, pages 1, 4
- iii) Exhibit No. 3, pages 7, 8, 15
- iv) Exhibit No. 5
- v) Exhibit No. 7, pages 2, 3, 4, 5, 6, 7
- vi) Exhibit No. 8, pages 1, 2

If you have any questions regarding the above, please do not hesitate to contact me.

NJC/mt (7239)  
 Attachment

cc: Mr. G. Maxwell W/A  
 Mr. V. Stallo (2) W/A

Yours very truly,

Original Signed By

N. J. Chiangi

N. J. Chiangi - Manager  
 Engineering & Construction  
 Quality Assurance/Quality Control

CAROLINA POWER & LIGHT COMPANY  
SHEARON HARRIS NUCLEAR POWER PLANT  
UNIT NO. 1

WELD SYMBOL ERRORS AND  
MISAPPLICATION OF WELD ON  
BERGEN-PATERSON PIPE HANGERS

FINAL REPORT

PREPARED BY:  
CAROLINA POWER & LIGHT COMPANY

REVISION 1

## INTRODUCTION

Seismic Class I Bergen-Paterson pipe hangers are detailed on design drawings which specify location, geometry, material and joint welding requirements. Welding processes, filler metal, etc. are described in Procedure MP-08 - "General Welding Procedure for Structural Steel (Seismic and Non-Seismic) and Hangers". Weld inspection requirements are specified in Site Specification No. 034, "Nondestructive Examination, Visual Inspection and Testing Requirements for Code Class 1, 2, 3, Balance-of-Plant Piping Systems, Seismic and Non-Seismic Structures for Permanent Plant Construction".

Work Procedure WP-110 - "Installation of Safety Related (Seismic Class I) Pipe Hangers and Thermally Analyzed Pipe Hangers" provides instruction to the craft regarding the installation of the pipe hangers.

Weld types most often used in the installation of pipe hangers are the fillet weld and the flare-bevel weld. Occasionally, a groove weld is used.

## DESCRIPTION

On September 3, 1980, the Resident NRC Inspector identified a problem with unclear and incorrect weld symbols on Bergen-Paterson Seismic Class I pipe hanger drawings. Also, field inspection by the Resident NRC Inspector identified situations where the weld actually applied on the pipe hangers differed from that required by the design drawing; i.e., over-welding (more weld length than required) and over-sized fillets.

The problem identified above prompted an immediate investigation of other pipe hanger drawings and reinspection of selected completed and inspected pipe hangers.

1. Approximately 1,200 pipe hanger drawings (representing hangers whose installation was either in progress or complete) were reviewed for errors and clarity. The results were many incorrect and unclear weld symbols.
2. Approximately 100 installed pipe hangers were reinspected by QA inspectors. The results were: 1) Welds larger and smaller than specified by the drawings; 2) fillet welds applied where full penetration groove welds were specified; 3) no evidence of complete penetration on some full penetration groove welds rendering them questionable; and, 4) welds being applied on more sides or fewer sides than specified.

## SAFETY IMPLICATIONS

Those hangers welded with smaller fillets, fewer sides than specified (under-welding) and improper welds, pose a potential safety concern in that these hangers, as installed, may not be capable of supporting their design loads or meeting their design margins.

Those hangers welded on more sides than specified (over-welding) pose a potential safety concern in that some hangers require flexibility at specific joints in order to not transmit large moment loads to the embedded steel support plates. Flexibility is obtained by no welding or minimal welding on certain sides of the joint.

Those hanger drawings with incorrect and unclear weld symbols pose a potential safety concern in that, if left uncorrected, would result in incorrect or questionable translation of design requirements in the installation and inspection process.

This item is considered reportable due to design drawing errors by Bergen-Paterson, failure to fabricate in accordance with design drawings by the craft personnel and failure of QA to translate design requirements to insure proper construction.

#### CORRECTIVE ACTION

The cause of the problem is three-fold: 1) Design drawing with incorrect or unclear weld details were provided by the vendor and, passing through all checking stages, were issued to the field uncorrected. 2) Field personnel failed to weld the pipe hangers in accordance with the design drawings and/or made welds when details were missing or unclear. 3) QA failed to insure that welds were applied in accordance with design drawings and/or that welds applied were clearly indicated on design drawings.

To prevent future occurrences, the following actions were taken:

1. The Site Mechanical and Welding Units are now reviewing pipe hanger design drawings for missing, unclear, and incorrect weld symbols prior to issuance to the field. Drawings with problems are reported to Ebasco/Bergen-Paterson for correction via pipe hanger problem memos (PHPs) written by the Site Mechanical Unit. Ebasco discussed the design drawing problems with Bergen-Paterson who identified the problem to their design personnel. Bergen-Paterson agreed to revise their review procedures to insure that design drawings show proper weld symbols. All drawings being issued from Bergen's three design offices are now routed through the Hempstead Office to provide more consistent review by Bergen engineering personnel. A review of 37 hanger design drawings issued by Bergen-Paterson since January 1, 1981 revealed only 3 design drawings with weld symbol problems.
2. Weld symbol identification training classes were conducted by Site Welding and Mechanical Engineers. Superintendents, general foremen, foremen, and welders of pipe and pipe hangers attended along with construction inspectors, QA inspectors, and mechanical unit personnel involved with pipe hangers. In addition to instruction on weld symbol identification, emphasis was given on the importance of welding the pipe hanger exactly as the design drawing requires. In those instances where this is not possible, due to physical limitations or drawing errors, the hanger drawing is to be returned to the Site Mechanical Unit. Analysis of QA inspection reports on welding performed since the training classes indicate that corrective action has been effective. For example, a test case of hangers welded and inspected since the training yielded the results shown in Exhibit 1.
3. In addition to attending the weld symbol identification classes referenced in 2. above, QA personnel attended similar classes given within the QA organization in order to strengthen weld symbol recognition skills and to emphasize the necessity for inspections to be in strict accordance with drawing details. QA personnel were instructed to report incorrect design drawings to the Site Mechanical Engineering Unit.

Due to the safety implications detailed earlier in this report, a program of corrective action was required for the hangers previously installed or partially installed. This corrective action was a 100% QA reinspection of all seismic pipe hangers that had ever been issued to the craft for work that were still active. Some pipe hangers were deleted by Ebasco or Bergen-Paterson and were omitted from the reinspection scope. This corrective action also included 100% in-house review of these hangers' design drawings. The results of the reinspection and in-house review of these hanger drawings and the resolutions of the problems identified are detailed on Exhibit No. 2. The hangers involved are shown on Exhibit No. 3.

As a result of our investigations of the welding problems of pipe hangers, we began to investigate other areas of welding activity for similar problems. The following report details our investigation and corrective and preventive actions on the welding of HVAC duct hangers and electrical cable tray and conduit hangers.

## HVAC, CABLE TRAY AND CONDUIT SEISMIC SUPPORT HANGERS

### DESCRIPTION

To begin the investigation of potential welding problems, several HVAC and electrical hanger drawings were reviewed. It was noted that numerous inconsistencies and unclear welding symbols and details existed on the design drawings. The discovery of clarity problems on the design drawings prompted a field spot check on several HVAC and electrical hangers to reveal any potential weld problems similar to the pipe hangers. The results of the spot check revealed: a) welds larger and smaller than design; b) welds being applied on more sides than required; c) welds improperly located; d) welds over holes or gaps between embedded plates; e) missing welds; f) missing welder's symbol.

Welds for HVAC, cable tray and conduit hangers were detailed on Ebasco Services design drawings as well as erection drawings furnished by the hanger vendor, Peden Steel. Welding processes are described in Procedure MP-08 - "General Welding Procedure for Structural Steel (Seismic and Non-Seismic) and Hangers" and weld inspection requirements are specified in Site Specification No. 034.

Work Procedure WP-400 - "Installation of HVAC Seismic Category I Support" and WP-203 - "Installation of Seismic Class I Electrical Cable Tray, Tray Support, Conduit, Conduit Support, Boxes and Box Support", provides instructions to the craft regarding hanger installation.

The weld type most frequently found in the design of electrical and HVAC hangers is a fillet weld. Flare-bevel welds are used on the attachment of unistrut supports and combination supports (supports that carry both HVAC duct and cable tray).

### SAFETY IMPLICATIONS

Those hangers welded with smaller fillets, fewer sides and missing welds pose a potential safety concern in that if the condition was left uncorrected, the hangers may not be capable of supporting their design loads.

Consideration for flexibility was not a concern as HVAC anchor type hangers are rigidly braced to prevent movement and HVAC guide type hangers are rigidly braced and designed to allow for thermal movement of the duct in one plane only. Flexibility was also of no concern for electrical hangers since they are of rigid design.

The occurrence of HVAC and electrical hanger problems were attributed to 1) failure of the A/E or the vendor to supply correct and clear design drawings; 2) failure of craft personnel to properly read and interpret the design drawings, and to bring to the attention of on-site engineering unclear information or questions; and 3) failure of QA personnel to interpret and to inspect welds to the design drawing.

To prevent future occurrences, the following actions were taken:

1. The A/E was notified and requested to make the design drawing corrections and to review additional design drawings to evaluate their present method of indicating design welds to welded connections.
2. Additional sessions of the weld symbol identification training classes were conducted by site welding and mechanical engineers. Craft supervisors, craft personnel, QA inspectors and construction inspectors involved with HVAC and electrical hangers attended. The subjects discussed were the same as those addressed in the classes conducted for pipe hanger personnel.
3. WP-400 - "Installation of HVAC Seismic Category I Supports", and WP-203 - "Electrical Cable Tray, Cable Tray Support, Conduit, Conduit Support, Boxes and Box Support", have been revised to include hold points during the erection and welding processes. The procedures also prohibit the craft from proceeding with work when problems arise during the erection process without resolution from the discipline engineer.
4. As a result of the problems identified during the field spot check of HVAC and electrical hangers, QA welding inspectors were assigned to reinspect all of the HVAC and electrical hangers that had been previously accepted. Approximately 100 HVAC and \* 300 cable tray and conduit hangers were reinspected for field errors and discrepancies. The results revealed that approximately 95% of the hangers reinspected had nonconforming conditions or deviations from the design drawings.

The results of the 100% reinspection are shown on Exhibits 4 and 5. A list of the affected HVAC and electrical hangers are shown on Exhibits 6 and 7 respectively. Welds were rejected based on the same criteria as applied to pipe hangers.

The rejected hangers were resolved by the following means:

1. Hangers with missing and undersized welds were rewelded in accordance with design documents with work controlled through the use of a rework package in which QA inspection and acceptance of the rework was documented.
2. Hangers that were missing welder's stencils were corrected in like manner as the pipe hangers.
3. Hangers with arc strikes, spatter, cold lap, undercut, slag and porosity were reworked with controls similar to item 1. and reinspected by QA.
4. Hangers with discrepancies such as oversized welds, welds over holes and gaps, improper weld locations, improper weld lengths, improper hanger fit-up and design drawing problems were dispositioned by engineering evaluations with permanent waivers (PWs) or field change requests (FCRs). See Exhibit 8 for listing of applicable FCRs and PWs.

SAMPLE NO. 1

- Analysis of QA Inspection Reports -  
Test Case of 63 Pipe Hangers  
Welded After Welder Training Class

63 hangers in test case

55 hangers acceptable; 87.3%

8 hangers rejectable; 12.7%

Rejected Hangers:

1. A-3-236-1-PD-H-1266  
Rejected 3/20/81      Overlap, lack of fusion
2. A-2-236-1-PD-H-1519  
Rejected 1/9/81      Convexity; Accepted 1/20/81
3. A-2-236-1-PD-H-1526  
Rejected 3/24/81      Oversized; Accepted 1/20/81
4. A-2-236-1-PD-H-1550  
Rejected 3/24/81      Overlap, weld splatter, arc strikes
5. T-2-261-1-FW-H-30  
Rejected 3/25/81      Arc Strikes, missing welds, lack of fusion
6. T-2-261-1-FW-H-31  
Rejected 3/25/81      Arc Strikes, undercut, overlap, undersize,  
missing welds
7. F-1-236-1-SF-H-463  
Rejected 3/28/81      Undercut; Accepted 4/3/81
8. W-6-236-1-WG-H-1706  
Rejected 3/28/81  
Rejected 4/4/81      Slag, overlap, weld splatters

Results of 100% In-House Review of  
Pipe Hanger Design Drawings and  
Reinspection of Pipe Hanger Welding

1. Drawing Review

1786 hanger design drawings were reviewed

\* 617 PHPs (pipe hanger problems) were written to report to Ebasco/  
Bergen -Paterson the problems identified. Problems were of  
three groups:

- a) Unclear symbols
- b) Missing symbols
- c) Incorrect symbols

Most PHPs reported problems with one hanger drawing only. A few reported problems with more than one hanger drawing. The PHP resulted in the issuance of a new drawing revision with corrections to the problems.

2. Reinspection

1786 pipe hangers issued for QA reinspection

701 determined to be not installed

487 pipe hangers found acceptable

598 pipe hangers rejected

Pipe hangers were rejected when the following conditions were found:

- |  |                                      |
|--|--------------------------------------|
| a. missing welder's symbols                  | i. welding over holes/gaps in embeds |
| b. oversized welds (greater than 1/8")       |                                      |
| c. undersized welds                          | j. slag                              |
| d. weld type applied not the same as drawing | k. porosity                          |
| e. overweld                                  | l. undercut                          |
| f. missing welds                             | m. overlap                           |
| g. incomplete penetration of groove welds    | n. arc strikes                       |
| h. welder's stencil in heat affected zones   | o. weld splatter                     |

The rejected pipe hangers were resolved by the following means:

1. Hangers with missing and undersized welds and those with cosmetic deficiencies (conditions j through o) were reissued to the craft for corrective rework and each was subsequently reinspected and accepted by QA. There were only a few hangers with missing or undersized welds. Some hangers rejected for missing welds were not reworked because the hanger's installation was only partially complete. The missing welds will be made when the hanger installation resumes. A few hangers that required rework were removed completely and the QA record of previous work was voided. This was done when the rework was extensive. These hangers will be reinstalled with new material and new QA inspections at a later date.
2. The overwelding condition found on hangers was resolved by FCR-H-286 if the overwelded hanger joint was not a flexible joint (pinned connection). If the overwelded joint was flexible, the joint was reworked by the craft. Seven hangers that were overwelded were determined by Ebasco/Bergen-Paterson and the Harris Plant Engineering Section to have flexible joints. These seven were reworked.
3. Hangers with oversized welds on non-flexible joints were resolved by FCR-H-286. Oversized welds were evaluated and determined to be of no consequence or detriment to the hanger's ability to perform its support function. However, if any case of local deformations or evidence of excessive heat being applied in the vicinity of oversized welds is noted during inspections this will be evaluated. Our inspection of oversized welds revealed no evidence of these two effects. Hangers with oversize welds (greater than 1/8" oversize) on flexible joints were resolved by rework.
4. Welds applied that did not agree with the hanger design drawing were of two types and were resolved as follows:
  - a) The weld differed because the weld symbol on the hanger design drawing was incorrect. The drawing error was reported to Ebasco/Bergen-Paterson via a PHP and a new drawing revision was issued showing the correct weld symbol.

- b) The weld differed because the craft did not apply the proper weld. Example: The craft may have applied a fillet weld when the proper weld would have required groove joint preparation and welding. In this case, resolution was either rework of the joint or a permanent waiver approved by Ebasco/Bergen-Paterson to accept the fillet weld "as-is". A new drawing revision was issued showing the new weld symbol.
5. Hangers reported to be missing a welder's stencil were resolved by several means:
- a) Initially, some of these hangers were wire brushed, the stencils identified and accepted by QA.
  - b) Later, some hangers whose initial inspection reports recorded the welder's stencil were accepted without brush-up work.
  - c) Finally, those hangers without initial inspection reports and/or any recording of the welder's symbols were accepted based on the fact that our code requirements do not commit us to impression stamp the hanger welds. See RCI-H-110 for details. Also, we are confident of our welder qualification program's ability to provide us with qualified pipe hanger welders and this small number does not significantly alter trend analysis data.
6. Groove welds which showed no evidence of complete penetration or complete penetration could not be verified from inspection records were resolved by two methods:
- a) In most cases, these hangers were resolved by a Permanent Waiver to accept fillet welding of the joint.
  - b) In a few cases, the weld joint was reworked by removing the old weld material, reparation of the hanger member and rewelding of the joint.
7. Some welds joining hanger members to the embed plates were to be located over the 1/4" diameter holes which secure the embed to the concrete forms and across gaps between adjoining embed plates. These welds, if made, were rejected as "questionable", and, if not made, were rejected as "missing". RCI-W-49 clarified the conditions for which acceptable welds could be made over holes and across gaps. Rework in accordance with RCI-W-49 was accomplished where conditions allowed. When rework was not allowed, 1" thick splicer plates were used to join the embeds and the hanger members was welded to the splicer plate. This was done in accordance with approved Ebasco design details.

8. Welder's stencils located in the heat affected zone were repaired by removing the stencils and relocating them outside the heat affected zones. The removing of the stencils was accomplished by grinding.
9. A total of \*258 hangers were reworked in the instances described above.

EXHIBIT NO. 3

Sheets 1 thru 16

Listing of installed Bergen-Paterson Hangers  
that received a QA field reinspection. Hangers  
with "Void" listed were deleted by Bergen-Paterson  
after the QA reinspection.

1.	A-1-190-1-CC-H-	600	4/E	36.	A-1-190-1-CT-H-	299	5/D
2.		602	5/D	37.		300	4/C
3.		612	3/C	38.		304	2/B
4.		635	4/D	39.		309	7/D
5.		636	2/B	40.		312	8/E
6.		641	3/D	41.		331	7/D
7.		644	5/E	42.		337	4/B
8.		1148	4/E	43.		338	8/E
9.		1153	8/I	44.		358	6/D
10.		1156	4/E	45.		359	5/C
11.		1157	5/F	46.		360	8/F
12.		1158	2/C	47.		423	4/C
13.		1159	5/F	48.		424	6/E
14.		1269	2/B	49.		427	4/C
15.		1271	2/B	50.		430	3/B
16.		1272	2/B	51.		432	3/B
17.		1277	2/B	52.		433	4/C
18.		1283	3/C	53.		434	6/E
19.	A-1-190-1-CH-H-	70	4/E	54.		438	3/B
20.		71	1/B	55.		440	4/C
21.		72	2/C	56.		442	3/B
22.		91	1/B	57.		446	3/B
23.		92	1/B	58.		447	3/B
24.	A-1-190-1-CT-H-	224	6/C	59.		449	3/B
25.		227	5/C	60.		451	3/B
26.		247	5/D	61.		459	10/H
27.		269	6/C	62.		460	8/F
28.		270	5/C	63.		462	6/D
29.		277	8/E	64.		464	7/E
30.		278	6/D	65.		466	5/C
31.		279	5/C	66.		468	5/C
32.		280	6/D	67.		469	5/C
33.		282	7/D	68.		470	6/D
34.		283	6/D	69.		471	6/D
35.		298	8/F	70.		472	8/F

71.	A-1-190-1-CT-H-	474	6/D	106.	A-1-190-1-PD-H-	53	1/B
72.		476	5/C	107.		54	1/B
73.		477	6/D	108.		55	1/B
74.		479	5/C	109.		56	1/B
75.		480	6/D	110.		59	2/C
76.		481	5/C	111.		63	1/B
77.		482	6/D	112.		65	1/B
78.		483	5/C	113.		67	1/B
79.		486	6/D	114.		69	2/C
80.		797	0/A	115.		71	3/D
81.	A-1-190-1-CX-H-	96	2/C	116.		72	1/B
82.	A-1-190-1-FP-H-	256	1/B	117.		73	3/D
83.	A-1-190-1-PD-H-	5	2/C	118.		74	3/D
84.		6	2/C	119.		75	1/B
85.		7	1/B	120.		76	2/C
86.		8	1/B	121.		77	1/B
87.		9	1/B	122.		78	2/C
88.		10	2/C	123.		81	1/B
89.		13	4/E	124.		82	2/C
90.		14	1/B	125.		83	1/B
91.		29	1/B	126.		84	3/D
92.		35	2/C	127.		86	4/E
93.		37	2/C	128.		87	1/B
94.		40	0/A	129.		88	2/C
95.		42	2/C	130.		89	1/B
96.		43	2/C	131.		91	0/A
97.		44	4/F	132.		92	1/B
98.		45	2/C	133.		97	1/B
99.		46	2/C	134.		98	1/B
100.		47	2/C	135.		102	2/C
101.		48	2/C	136.		103	2/C
102.		49	0/A	137.		104	2/C
103.		50	2/C	138.		105	1/B
104.		51	1/B	139.		107	4/E
105.		52	1/B	140.		109	0/A

141.	A-1-190-1-PD-H-	111	2/C	176.	A-3-216-1-PD-H-	341	4/E
142.		112	2/C	177.		345	1/B
143.		113	1/B	178.		352	1/B
144.		115	1/B	179.		367	1/B
145.	A-1-190-1-RH-H-	15	7/D	180.		368	0/A
146.		16	4/D	181.		369	1/B
147.		17	3/B	182.		370	0/A
148.		25	7/E	183.		371	2/C
149.		26	5/D	184.		489	1/B
150.		33	5/C	185.		490	1/B
151.		35	6/D	186.		491	0/A
152.		45	7/E	187.		492	1/B
153.		53	0/A	188.		493	1/B
154.		55	6/D	189.		494	2/C
155.		57	6/B	190.		495	1/B
156.		60	7/D	191.		496	3/D
157.		62	7/C	192.		565	1/B
158.		63	13/J	193.		567	2/C
159.		64	7/D	194.		569	0/A
160.	A-3-216-1-CT-H-	208	3/C	195.		570	0/A
161.		209	0/A	196.		571	2/C
162.		211	0/A	197.		572	1/B
163.		213	0/A	198.		576	2/C
164.		214	0/A	199.		577	0/A
165.		216	0/A	200.		578	1/B
166.		249	3/D	201.		615	0/A
167.		250	1/B	202.		616	1/B
168.		252	3/C	203.		617	0/A
169.		253	2/B	204.		619	4/E
170.		254	2/B	205.		620	5/F
171.		257	3/C	206.		621	0/A
172.		274	5/E	207.		622	0/A
173.	A-3-216-1-FP-H-	246	1/B	208.		623	1/B
174.		270	1/B	209.		627	0/A
175.	A-3-216-1-PD-H-	339	3/D	210.		628	0/A

211.	A-3-216-1-PD-H-	629	1/B	246.	A-3-216-1-SW-H-	362	4/C
212.		630	1/B	247.		364	2/B
213.		631	4/E	248.		366	1/B
214.		633	3/D	249.		368	2/B
215.		634	3/D	250.		370	5
216.		635	1/B	251.		372	3/C
217.		636	1/B	252.		374	4/B
218.		637	4/E	253.		378	4/B
219.		639	1/B	254.		379	3/C
220.		640	1/B	255.		380	3/C
221.		641	1/B	256.		381	3/C
222.		642	0/A	257.		382	3/C
223.		643	4/E	258.		384	3/C
224.		645	4/E	259.		385	3/C
225.		647	2/C	260.		386	3/C
226.		648	2/C	261.		387	3/C
227.		649	1/B	262.		388	3/C
228.		650	2/C	263.		391	3/C
229.		652	4/E	264.		392	3/C
230.		689	0/A	265.		393	3/C
231.		690	1/B	266.		394	3/C
232.		691	0/A	267.		398	0/A
233.		692	1/B	268.		400	0/A
234.		693	0/A	269.		404	0/A
235.		694	1/B	270.		406	1/B
236.		695	1/B	271.		410	1/B
237.		696	0/A	272.		412	2/B
238.		697	4/E	273.		448	3/C
239.		1132	3/D	274.		452	3/C
240.		1134	2/C	275.		454	2/B
241.		1135	3/D	276.		455	2/B
242.		2086	1/B	277.		456	3/C
243.		2092	0/A	278.		458	2/B
244.	A-3-216-1-SW-H-	359	2/B	279.		459	2/B
245.		360	2/B	280.		460	3/C

281.	A-3-216-1-SW-H-	462	2/B	316.	A-3-216-1-SW-H-	906	1/B
282.		463	2/B	317.		907	1/B
283.		464	3/C	318.		908	1/B
284.		466	2/B	319.		927	1/B
285.		467	2/B	320.		928	1/B
286.		468	2/B	321.		929	1/B
287.		471	3/C	322.		930	1/B
288.		475	3/C	323.		932	1/B
289.		517	3/C	324.		934	1/B
290.		519	4/D	325.		935	1/B
291.		521	3/C	326.		936	1/B
292.		528	6/F	327.		943	2/C
293.		529	4/D	328.		947	1/B
294.		530	3/C	329.		952	2/C
295.		531	4/C	330.		953	2/C
296.		532	4/C	331.		959	1/B
297.		533	4/C	332.		960	1/B
298.		534	4/C	333.		978	2/C
299.		535	4/C	334.		979	4/E
300.		536	4/C	335.		982	4/E
301.		537	4/C	336.		991	2/C
302.		538	4/C	337.		1176	3/D
303.		539	5/D	338.		1177	1/B
304.		540	2/B	339.		1181	1/B
305.		545	4/D	340.		1183	1/B
306.		608	3/C	341.		1184	1/B
307.		893	1/B	342.		1186	1/B
308.		895	2/C	343.		1201	3/D
309.		897	1/B	344.		1203	2/C
310.		899	1/B	345.	A-4-216-1-CT-H-	259	5/E
311.		901	1/B	346.		260	4/D
312.		902	2/C	347.		261	4/D
313.		903	1/B	348.		262	4/D
314.		904	1/B	349.		263	2/B
315.		905	1/B	350.	A-4-216-1-PD-H-	307	2/C

351.	A-4-216-1-PD-H-	317	0/A	386.	A-4-216-2-SW-H-	596	3/B
352.		319	4/E	387.		598	4/B
353.		320	1/B	388.		602	3/B
354.		321	4/E	389.		603	3/B
355.		735	2/C	390.		604	4/C
356.		736	1/B	391.		605	4/C
357.	A-4-216-1-SW-H-	419	6/E	392.		1876	1/B
358.		420	2/B	393.		1878	0/A
359.		422	4/C	394.	F-1-216-1-FP-H-	1075	1/B
360.		424	2/B	395.		1077	2/C
361.		477	4/C	396.		1079	1/B
362.		479	3/B	397.		1080	1/B
363.		484	3/B	398.		1081	1/B
364.		487	4/E	399.		1082	1/B
365.		489	5/C	400.		1084	2/C
366.		547	5/D	401.		1085	1/B
367.		568	6/B	402.		1086	1/B
368.		570	7/E	403.		1088	2/C
369.		572	4/C	404.		1090	1/B
370.		581	3/B	405.	F-2-216-1-FP-H-	1114	2/C
371.		583	3/B	406.		1125	2/C
372.		585	3/B	407.		1127	2/C
373.	A-4-216-2-CT-H-	641	2/B	408.		1129	2/C
374.		643	1/A	409.		1131	2/C
375.	A-4-216-2-PD-H-	228	1/B	410.	A-2-236-1-AF-H-	83	4/E
376.	A-4-216-2-SW-H-	425	4/C	411.		85	2/C
377.		552	4/C	412.		109	1/B
378.		554	4/C	413.		114	3/D
379.		556	4/C	414.		118	3/D
380.		563	3/B	415.		119	2/C
381.		565	2/B	416.		120	1/B
382.		576	3/B	417.		129	2/C
383.		578	4/C	418.		133	2/C
384.		589	3/B	419.		134	2/C
385.		595	4/C	420.		135	1/B

421.	A-2-236-1-AF-H-	138	2/C
422.		144	3/D
423.	A-2-236-1-BD-H-	131	1/B
424.		132	1/B
425.		139	2/C
426.		142	1/B
427.	A-2-236-1-BR-H-	467	0/A
428.		468	0/A
429.		1553	0/A
430.		1554	0/A
431.		1555	0/A
432.		1556	0/A
433.		1557	0/A
434.		1558	0/A
435.		1559	0/A
436.		1560	0/A
437.	A-2-236-1-CC-H-	89	2/C
438.		90	1/B
439.		91	2/C
440.		92	3/D
441.		93	5/F
442.		94	2/C
443.		95	2/C
444.		97	2/C
445.		98	2/C
446.		99	3/D
447.		100	6/G
448.		101	4/E
449.		102	5/F
450.		105	3/D
451.		107	2/C
452.		110	2/C
453.		111	1/B
454.		112	2/C
455.		113	1/B

456.	A-2-236-1-CC-H-	374	2/C
457.		473	5/F
458.		483	3/D
459.		662	3/D
460.		663	2/C
461.		665	2/C
462.		667	2/C
463.		668	2/C
464.		669	3/D
465.		670	1/B
466.		671	4/E
467.		672	4/E
468.		673	4/E
469.		677	1/B
470.		678	2/C
471.		877	2/C
472.		878	1/B
473.		880	2/C
* 474.	DELETE		
475.		887	1/B
476.		888	4/E
477.		889	2/C
478.		891	2/C
479.		892	2/C
480.		893	2/C
481.		894	1/B
482.		896	2/C
483.		900	3/D
484.		902	2/C
485.		903	1/B
486.		905	1/B
487.		906	4/E
488.		908	4/E
489.		909	2/C
490.		910	1/B

491.	A-2-236-1-CC-H-	911	4/E	526.	A-2-236-1-CC-H-1562	O/A
492.		913	2/C	527.		1564 O/A
493.		914	2/C	528.		1566 O/A
494.		916	3/D	529.		1576 O/A
495.		918	4/E	530.		1583 O/A
496.		919	5/F	531.		1584 1/B
497.		920	2/C	532.		1587 O/A
498.		922	1/B	533.		1598 1/B
499.		942	4/E	534.		1599 O/A
500.		943	2/C	535.		1601 O/A
501.		944	3/D	536.		1603 2/C
502.		945	4/E	537.		1604 O/A
503.		947	5/F	538.	A-2-236-1-CE-H-	11 O/A
504.		948	3/D	539.		14 2/C
505.		949	1/B	* 540.	DELETE	
506.		952	4/E	541.		18 3/D
507.		958	2/C	542.		21 1/B
508.		965	4/E	543.		22 1/B
509.		967	5/F	544.		25 1/B
510.		968	3/D	545.	A-2-236-1-CH-H-	166 O/A
511.		969	4/E	546.		168 O/A
512.		976	2/C	547.		169 1/B VOID
513.		1211	1/B	548.		170 2/C
514.		1213	O/A VOID	549.		171 1/B
515.		1216	O/A	550.		176 O/A
516.		1218	O/A	551.		177 1/B
517.		1220	2/C	552.		181 4/E
518.		1222	O/A	552A.		193 O/A VOID
519.		1224	1/B	553.		194 O/A VOID
520.		1247	O/A	554.		195 1/B
521.		1310	O/A	555.		201 1/B
522.		1312	O/A	556.		203 1/B
523.		1326	O/A	557.		204 1/B
524.		1557	O/A	558.		205 1/B
525.		1560	O/A	559.		206 1/B
				560.		207 1/B

561.	A-2-236-1-CH-H-	208	1/B	596.	A-2-236-1-FP-H-	735	1/B
562.		249	5/B	597.		736	1/B
563.	A-2-236-1-CS-H-	8	5/D	598.		737	1/B
564.	A-2-236-1-CX-H-	228	0/A	599.		738	1/B
565.		229	1/B	600.		739	0/A
566.		248	3/D	601.		749	2/C
567.		249	3/D	602.		757	1/B
568.		391	3/D	603.		761	1/B
569.		397	3/C	604.		790	1/B
570.		400	0/A	605.		791	1/B
571.		423	1/B VOID	606.		792	2/C
572.		424	1/B VOID	607.		793	3/D
573.		425	1/B	608.		794	2/C
574.		426	1/B VOID	609.		795	1/B
575.		427	1/B VOID	610.		799	2/C
576.		432	1/B	611.		800	3/D
577.		433	1/B	612.		801	3/D
578.		437	1/B	613.		803	3/D
579.		438	2/C	614.		804	3/D
580.		442	1/B	615.		805	1/B
581.		446	1/B	616.		806	2/C
582.	A-2-236-1-DW-H-	79	0/A	617.		882	2/C
583.		81	1/B	618.		884	0/A
584.	A-2-236-1-FP-H-	525	1/B VOID	619.		886	0/A
585.		526	1/B	620.		888	1/B
586.		527	0/A	621.		890	0/A
587.		533	1/B	622.		894	0/A
588.		626	0/A	623.		896	1/B
589.		629	0/A	624.		899	0/A
590.		729	1/B	625.		900	0/A
591.		730	1/B	626.		901	0/A
592.		731	0/A	627.		908	0/A
593.		732	1/B	628.		911	0/A
594.		733	2/C	629.		912	0/A
595.		734	1/B	630.		913	0/A

631.	A-2-236-1-FP-H-	921	O/A	666.	A-2-236-1-PM-H-	228	O/A
632.		924	O/A	667.		229	O/A
633.	A-2-236-1-PD-H-	1502	O/A	668.	A-2-236-1-RH-H-	166	2/C
634.		1503	O/A	669.		174	4/E
635.		1504	1/B	670.		183	3/D
636.		1505	1/B	671.		199	1/B
637.		1506	O/A	672.	A-2-236-1-SW-H-	345	O/A
638.		1507	O/A	673.		346	O/A
639.		1508	O/A	674.		354	O/A
640.		1509	O/A	675.		355	2/C
641.		1516	O/A	676.		433	O/A
642.		1518	O/A	677.		441	O/A
643.		1520	1/B	678.		442	O/A
644.		1522	1/B	679.		443	O/A
645.	A-2-236-1-PM-H-	185	O/A	680.		444	O/A
646.		187	O/A	681.		445	O/A
647.		189	O/A	682.		446	1/B
648.		191	1/B	683.		507	2/C
649.		196	O/A	684.		509	2/C
650.		197	1/B	685.		510	2/C
651.		198	O/A	686.		511	2/C
652.		200	O/A	687.		512	2/C
653.		201	O/A	688.		513	2/C
654.		209	O/A	689.		515	3/D
655.		213	1/B	690.		961	1/B
656.		216	O/A	691.		1207	1/B
657.		217	O/A	692.		1231	3/D
658.		218	O/A	693.		1235	2/C
659.		220	O/A	694.		1237	1/B
660.		221	O/A	695.		1239	1/B
661.		222	O/A	696.		1241	4/E
662.		223	O/A	697.		1242	3/D
663.		224	O/A	698.		1244	1/B
664.		225	O/A	699.		1245	1/B
665.		227	O/A	700.		1254	2/C

701.	A-2-236-1-SW-H-1258	4/E	736.	A-3-236-1-BD-H-	338	2/C
702.		1454	737.		339	2/C
703.		1458	738.	A-3-236-1-CC-H-	340	5/F
704.		1481	739.		341	5/F
705.		1483	740.		342	6/G
706.		1485	741.		344	6/G
707.		1535	742.		346	4/E
708.		1537	743.		348	3/D
709.		1540	744.		349	4/E VOID
710.	A-3-236-1-AF-H-	149	745.		368	2/C
711.		151	746.		375	1/B
712.		153	747.		378	2/C
713.		160	748.		379	1/B
714.		161	749.		380	1/B
715.	A-3-236-1-BD-H-	144	750.		381	2/C
716.		146	751.		384	1/B
717.		147	752.		385	2/C
718.		148	753.		386	1/B
719.		149	754.		387	2/C
720.		150	755.		388	2/C
721.		151	756.		391	5/F
722.		155	757.		393	4/E
723.		157	758.		397	3/D
724.		160	759.		401	2/C
725.		162	760.		402	5/F
726.		192	761.		404	1/B
727.		193	762.		464	4/E
728.		199	763.		469	4/E
729.		203	764.		471	3/D
730.		204	765.		474	2/C
731.		205	766.		475	1/B
732.		231	767.		476	2/C
733.		232	768.		479	3/D
734.		233	769.		484	3/D
735.		242	770.		485	2/C

771.	A-3-236-1-CC-H-	488	3/D	806.	A-3-236-1-CC-H-1185	4/E	
772.		490	4/E	807.		1190	2/C
773.		492	5/F	808.		1192	2/C
774.		494	2/C	809.		1193	4/E
775.		497	3/D	810.		1194	3/D
776.		499	3/D	811.		1232	0/A
777.		501	2/C	812.		1321	0/A
778.		502	3/D	813.		1572	2/C
779.		508	2/C	814.		1580	1/B
780.		509	2/C	815.		1581	2/C
781.		510	2/C	816.		1583	0/A
782.		511	4/C	817.		1600	0/A
783.		512	3/D	818.	A-3-236-1-CE-H-	4	1/B
784.		926	2/C	819.		6	2/C
785.		927	3/D	820.		7	4/E
786.		929	3/D	821.		8	2/C
787.		931	1/B	822.		302	1/B
788.		932	4/E	823.	A-3-236-1-CH-H-	144	0/A
789.		936	0/A	824.		145	0/A
790.		938	2/C	825.		147	0/A
791.		978	1/B	826.		151	1/B
792.		980	1/B	827.		273	0
793.		982	1/B	828.		279	3/D
794.		983	1/B	829.		281	1/B
795.		984	1/B	830.		284	2/C
796.		985	2/C	831.		307	1/B
797.		986	3/D	832.		311	0/A
798.		989	1/B	833.		364	0/A
799.		1011	1/B	834.		365	1/B
800.		1016	2/C	835.		366	0/A
801.		1017	1/B	836.		367	2/C
802.		1058	1/A	837.		368	0/A
803.		1062	1/A	838.		369	1/B VOID
804.		1064	2/B	839.		370	1/B VOID
805.		1188	2/C	840.		390	1/B

841.	A-3-236-1-CH-H-	392	O/A	VOID	876.	A-3-236-1-FP-H-	649	2/C
842.		415	O/A		877.		650	2/C
843.		420	O/A	VOID	878.		651	2/C
844.		422	1/B		879.		652	2/C
845.		425	1/B		880.		653	2/C
846.		426	O/A		881.	A-3-236-1-MS-H-	408	2/C
847.		429	2/C		882.		409	1/B
848.	A-3-236-1-CX-H-	290	2/C		883.		444	1/B
849.		362	2/B		884.	A-3-236-1-SW-H-	1195	1/B
850.		364	4/E		885.		1199	1/B VOID
851.		370	3/D		886.		1262	4/E
852.		374	4/E		887.		1263	2/C
853.		378	4/E		888.		1264	2/C
854.		380	2/C		889.		1265	2/C
855.	A-3-236-1-DW-H-	83	O/A		890.		1266	1/B
856.		84	O/A		891.		1269	1/B
857.	A-3-236-1-FP-H-	508	1/B		892.		1270	1/B
858.		509	O/A		893.		1291	O/A
859.		511	1/B		894.		1292	O/A
860.		512	1/B		895.		1293	2/C
861.		513	3/D		896.		1294	1/B
862.		514	O/A		897.		1295	3/D
863.		515	1/B		898.		1296	1/B
864.		516	1/B		899.		1574	1/B
865.		518	2/C		900.		1607	3/C
866.		519	1/B		901.	W-5-236-1-WG-H-	386	2/C
867.		538	O/A		902.		387	2/C
868.		542	2/C		903.		392	2/C
869.		545	1/B		904.		393	2/C
870.		546	O/A		905.		406	1/B
871.		604	2/C		906.		407	O/A
872.		639	2/C		907.		408	2/C
873.		640	3/D		908.		409	2/C
874.		641	2/C		909.		411	2/C
875.		648	2/C		910.		414	1/B

911.	W-5-236-1-WG-H-	415	O/A	946.	W-5-236-1-WG-H-	520	2/C
912.		416	2/C	947.		521	3/D
913.		417	2/C	948.		523	1/B
914.		422	1/B	949.		525	1/B
915.		423	2/C	950.		527	2/C
916.		424	2/C	951.		529	3/D
917.		438	2/C	952.		533	O/A
918.		444	O/A	953.		536	O/A
919.		445	O/A	954.		538	2/C
920.		446	1/B	955.		541	3/D
921.		447	1/B	956.		542	2/C
922.		450	4/E	957.		557	1/B
923.		451	2/C	958.		565	1/B
924.		455	O/A	959.		566	2/C
925.		457	1/B	960.		567	2/C
926.		462	2/C	961.		570	2/C
927.		463	2/C	962.		571	2/C
928.		467	2/C	963.		580	1/B
929.		470	2/C	964.		581	1/B
930.		471	2/C	965.		582	1/B
931.		474	3/D	966.		583	1/B
932.		475	O/A	967.		585	1/B
933.		476.	2/C	968.		598	4/E
934.		477	3/D	969.		599	2/C
935.		482	3/D	970.		600	2/C
936.		485	1/B	971.		601	3/D
937.		490	1/B	972.		610	2/C
938.		491	1/B	973.		620	3/D
939.		510	1/B	974.		621	2/C
940.		511	1/B	975.		627	2/C
941.		512	1/B	976.		1065	2/C
942.		513	1/B	977.		1066	2/C
943.		515	1/B	978.		1067	2/C
944.		518	2/C	979.	W-5-236-1-WL-H-	2192	1/B
945.		519	2/C	980.		2196	1/B

981.	W-6-236-1-WG-H-	628	1/B	1016.	A-5-236-1-CC-H-	463	2/C
982.		630	2/C	1017.	A-5-236-1-SW-H-	495	2/C
983.		633	0/A	1018.		496	0/A
984.		639	1/B	1019.		503	0/A
985.		669	3/D	1020.		505	0/A
986.		670	4/E	1021.		1346	0/A
987.		672	4/E	1022.		1653	0/A
988.		680	1/B	1023.	A-5-236-2-SW-H-	786	0/A
989.		681	1/B	1024.		787	0/A
990.		682	1/B	1025.	F-1-236-1-SF-H-	879	2/C
991.		683	1/B	1026.		890	1/B
992.		691	1/B	1027.		902	4/E
993.		692	1/B	1028.		910	1/B
994.		693	2/C	1029.		916	1/B
995.		705	2/C	1030.	T-2-240-1-SW-H-	265	6/G
996.		710	2/C	1031.		266	5/F
997.		711	1/B	1032.		267	5/F
998.		712	3/D	1033.		268	5/C
999.		717	2/C	1034.		269	5/F
1000.		723	2/C	1035.		270	5/F
1001.		729	3/D	1036.		271	5/F
1002.		731	3/D	1037.		272	5/F
1003.		732	3/D	1038.		274	6/G
1004.		733	2/C	1039.		275	5/F
1005.		734	3/D	1040.		276	5/F
1006.		735	3/D	1041.		277	5/F
1007.		739	2/C	1042.		278	5/F
1008.		750	0/A	1043.		279	5/F
* 1009.		752	0/A VOID	1044.		280	5/F
1010.		759	2/C	1045.		281	5/F
1011.		762	3/D	1046.		283	6/G
1012.		763	2/C	1047.		284	5/F
1013.		767	2/C	1048.		285	4/E
1014.		771	3/D	1049.		286	5/F
1015.	A-5-236-1-CC-H-	352	4/E	1050.		287	5/F

1051.	T-2-240-1-SW-H-	288	5/E
1052.		289	5/F
1053.		290	5/F
1054.		291	5/F
1055.		292	9/K
1056.		293	8/J
1057.		294	8/J
1058.		295	8/J
1059.		296	8/J
1060.		297	8/J
1061.		298	8/J
1062.		299	8/J
1063.		300	8/J
1064.		301	5/F
1065.		317	4/E
1066.		323	5/F
1067.		325	5/F
1068.		331	8/J
1069.		332	6/G
1070.		333	7/H
1071.		334	6/G
1072.		335	6/G
1073.		336	6/G
1074.		337	6/G
1075.		338	6/G
1076.		339	6/G
1077.		815	7/H
1078.	TK-1-236-1-PM-H-	289	0/A
1079.		292	1/B
1080.		293	1/B
1081.		294	1/B
1082.		295	1/B
1083.		298	1/B
1084.		300	2/C
1085.		301	1/B
1086.		302	1/B

HVAC HANGER INSPECTION STATUS

REINSPECTION

85 Duct Hangers Reinspected

81 Hangers rejected

2 Determined to have engineering problems

2 Hangers tacked

RESOLUTIONS

41 Hangers accepted by waivers

40 Hangers reworked

EXHIBIT 5

ELECTRICAL HANGERS REINSPECTION STATUS

- \* 296 - Total cable tray & conduit hangers inspected
- \* 268 - Rejected hangers
- \* 17 - Accepted hangers
- \* 13 - Hangers with engineering problems

RESOLUTION OF THE \* 268 REJECTED HANGERS

- \* 154 - Hangers accepted by PW or FCR
- \* 19 - Hangers accepted by field rework
- \* 95 - Hangers accepted by combination of field rework and PW's or FCR's

REINSPECTION LIST OF  
HVAC DUCT SEISMIC SUPPORTS

RAB 190 ELEV.

F-1930	F-1011	F-1933
F-1931	F-1012	
F-1016	F-1013	
F-1000	F-1014	
F-1001	F-1002	
F-1008	F-1004	
F-1009	F-1934	
F-1005	F-1200	
F-1203	F-1201	

RAB 236 ELEV.

F-1098	F-1090	F-1926	F-1956
F-1291	F-1092	F-1927	
F-1292	F-1093	F-1928	
F-1101	F-1094	F-1929	
F-1100	F-1095	F-1950	
F-1099	F-1096	F-1951	
F-1123	F-1097	F-1102	
F-1086	F-1108	F-1952	
F-1087	F-1109	F-1953	
F-1088	F-1110	F-1954	
F-1089	F-1111	F-1955	

EMDRAC Drawings 1364-12756 Rev. 5, 1364-16318 Rev. 1, 1364-16319 Rev. 1, 1364-16320 Rev. 2 were used by QA to perform the reinspection on the above hangers.

(continued)

HVAC DUCT SEISMIC SUPPORTS

RAB 247 ELEV.

F-1696	F-1297	F-1703
F-1103	F-1483	F-1704
F-1104	F-1486	F-1305
F-1298	F-1300	F-1494
F-1105	F-1699	F-1707
F-1904	F-1303	F-1304
F-1301	F-1905	F-1307
F-1702	F-1901	F-1495
F-1489	F-1491	F-1708
F-1490	F-1906	F-1309
F-1501	F-1711	

TOTAL HANGERS: 85

REINSPECTION LIST OF  
CABLE TRAIL & CONDUIT SUPPORT HANGER

- |                           |                           |
|---------------------------|---------------------------|
| 1. 7021-EC2328            | 26. 7042-ED2351-2         |
| 2. 7041-ED2326            | 27. 7042-ED2351-3         |
| 3. 7021-HC2301            | 28. 7041-CD2311           |
| 4. 7021-EC2327            | 29. 7041-ED2312           |
| 5. 7041-HD2315            | 30. 7041-ED2313           |
| 6. 7021-EC2353-1          | 31. 7041-ED2314           |
| 7. 7021-EC2352            | 32. 7041-ED2315           |
| 8. 7021-EC2353-2          | 33. 7041-ED2316           |
| 9. 7041-ED2324 - Sect. R  | 34. 7041-ED2319           |
| 10. 7041-ED2324           | 35. 7041-ED2322           |
| 11. 7041-HD2312           | 36. 7041-ED2333           |
| 12. 7041-ED2325           | 37. 7041-ED2321           |
| 13. 7041-CD2310           | 38. 7041-ED2308-1         |
| 14. 7041-CD2308           | 39. 7041-ED2307-1         |
| 15. 7041-ED2323           | 40. 7041-ED2307-2         |
| 16. 7041-ED2328           | 41. 7041-ED2308-2         |
| 17. 7041-ED2328 - Sect.   | 42. 7041-CD2309           |
| 18. 7041-ED2320 - Sect. H | 43. 7041-ED2310           |
| 19. 7041-ED2320           | 44. 7042-HD2365           |
| 20. 7041-ED2302           | 45. 7041-ED2303-1         |
| 21. 7041-ED2301-2         | 46. 7041-ED2303-2         |
| 22. 7041-ED2301-1         | 47. 7041-ED2304           |
| 23. 7042-ED2358-3         | 48. 7041-ED2306 - Sect. E |
| 24. 7042-CD2364           | 49. 7041-ED2306 - Sect. F |
| 25. 7042-ED2351-1         | 50. 7041-EC2339           |

51.	7021-EC2323	76.	7041-ED2309
52.	7021-EC2317	77.	7041-ED2311
53.	7021-EC2322	* 78.	DELETE
54.	7021-HC2307	79.	7042-ED2365
55.	7021-HC2306	80.	7042-CD2369
56.	7021-HC2303	* 81.	DELETE
57.	7021-HC2302	82.	7021-EC2325
58.	7021-EC2326-2	83.	7042-ED2380
59.	7021-EC2341	* 84.	DELETE
60.	7021-EC2326-1	85.	7042-HD2370
61.	7042-ED2356	86.	7042-CD2363
62.	7042-ED2357-1	87.	7042-ED2358-1
63.	7042-ED2357-2	88.	7042-ED2358-2
* 64.	DELETE	* 89.	DELETE
65.	7042-ED2375	* 90.	DELETE
66.	7042-CD2365	* 91.	DELETE
67.	7042-ED2373	* 92.	DELETE
68.	7042-ED2352	* 93.	DELETE
69.	7042-ED2366	94.	7042-ED2353
70.	7042-ED2379	95.	7042-CD2366
71.	7041-ED2305-1	* 96.	DELETE
72.	7041-ED2305-2	* 97.	DELETE
73.	7041-ED2305-3	* 98.	DELETE
74.	7041-ED2306-1	* 99.	DELETE
75.	7041-ED2306-2	* 100.	DELETE

* 101. DELETE	126. 7021-EC2346-2
102. 697S01-9	127. 7021-EC2356
103. 697S01-10	128. 7021-EC2355
104. 697S01-11	129. 7021-EC2305
105. 697S01-12	130. 7021-EC2338
106. 697S01-13	131. 7021-EC2304-4
107. 697S01-14	132. 7021-EC2302-1
108. 697S01-15	133. 7021-EC2345
109. 697S01-16	134. 7021-EC2304-1
110. 697S01-17	135. 7021-EC2304-3
111. 697S01-18	136. 7021-EC2358-2
112. 7021-EC2304-2	137. 7021-EC2358-1
113. 7021-EC2337	138. 7021-EC2357
114. 7021-EC2346-3	139. 7021-EC2340
115. 7021-EC2360-1	140. 697S01-30
116. 7021-EC2360-2	141. 697S01-31
117. 7021-EC2324-	142. 697S01-32
118. 7021-EC2302-2	143. 697S01-33
119. 7021-EC2359	144. 697S01-34
120. 7021-EC2316	145. 697S01-35
121. 7021-EC2306-1	146. 697S01-36
122. 7021-EC2306-2	147. 697S01-37
123. 7021-EC2346-1	148. 697S01-38
124. 7021-EC2348-1	149. 697S01-39
125. 7021-EC2348-2	150. 697S01-40

151.	697S01-41	176.	7026-EC2659-265
152.	697S01-52	177.	7026-EC2659-270
153.	697S01-53	178.	7026-EC2659-275
154.	697S01-67	179.	7026-EC2659-279
155.	697S01-60	180.	7026-EC2649
156.	697S01-42	181.	7026-EC2634
157.	697S01-43	182.	7026-EC2664-6
158.	697S01-44	183.	7026-EC2664-8
159.	697S01-45	184.	7026-EC2608-1
160.	697S01-46	185.	7026-EC2608-2
161.	697S01-47	186.	7026-EC2601-1
162.	697S01-48	187.	7026-EC2602-3
163.	697S01-49	188.	7026-EC2635
164.	697S01-50	189.	7026-EC2603
165.	697S01-51	190.	7026-EC2613
166.	7021-HC2309	191.	7026-EC2605
167.	7021-HC2308	192.	7026-EC2602-2
168.	7021-EC2354-3	193.	7026-EC2602-1
169.	7021-EC2354-2	* 194.	DELETE
170.	7021-EC2354-1	* 195.	DELETE
171.	7026-EC2638 - Sect. AE	* 196.	DELETE
172.	7026-EC2638 Sect. G	* 197.	DELETE
173.	7026-EC2638 - Sect. K	* 198.	DELETE
174.	7026-EC2638 - Sect. M	* 199.	DELETE
175.	7026-EC2641	* 200.	DELETE

* 201. DELETE	226. 699S02-40
* 202. DELETE	227. 699S02-41
* 203. DELETE	228. 699S02-44
* 204. DELETE	229. 699S02-69
* 205. DELETE	230. 699S02-72
* 206. DELETE	231. 699S02-73
207. 699S02-131	232. 699S02-74
208. 699S02-130	233. 699S02-139
209. 699S02-100	234. 699S02-140
210. 699S02-99	235. 699S02-141
211. 699S02-98	236. 699S02-142
212. 699S02-96	237. 699S02-145
213. 699S02-95	238. 699S02-146
214. 699S02-97	239. 699S02-147
215. 699S02-96 & 97 Brace	240. 699S02-18
216. 699S02-27	241. 699S02-19
217. 699S02-28	242. 699S02-20
218. 699S02-29	243. 699S02-22
219. 699S02-30	244. 699S02-23
220. 699S02-31	245. 699S02-24
221. 699S02-35	* 246. 699S02-25 ("Temp. Support")
222. 699S02-36	247. 699S02-26
223. 699S02-37	248. 699S02-21
224. 699S02-38	249. 699S02-117
225. 699S02-39	250. 699S02-116

251.	699S02-115	276.	699S02-144
252.	699S02-114	277.	699S02-43
253.	699S02-113	278.	699S02-14
254.	699S02-112	279.	699S02-1
255.	699S02-111 & 112	280.	699S02-136
256.	699S02-111	281.	699S02-137
257.	699S02-110	282.	699S02-133
258.	699S02-109	* 283.	DELETE
259.	699S02-109 & 108	* 284.	DELETE
260.	699S02-108	285.	699S02-143
261.	699S02-107	286.	699S02-56
262.	699S02-91	287.	699S02-50
263.	699S02-62	288.	699S02-51
264.	699S02-88	289.	699S02-49
265.	699S02-119	290.	699S02-47
266.	699S02-118	291.	699S02-46
267.	699S02-15	292.	699S02-101 & 100
268.	699S02-16	293.	699S02-101
269.	699S02-17	294.	699S02-102
270.	699S02-45	* 295.	699S02-103 ("Temp. Support")
271.	699S02-48	296.	699S02-104
272.	699S02-55	297.	699S02-105
273.	699S02-54	298.	699S02-106
274.	699S02-53	* 299.	DELETE
275.	699S02-52	* 300.	DELETE

301.	7026-EC260*2-3	326.	699S02-63
* 302.	DELETE	327.	699S02-64
* 303.	DELETE	328.	699S02-65
* 304.	DELETE	329.	699S02-68
* 305.	DELETE	330.	699S02-89
* 306.	DELETE	331.	699S02-90
* 307.	DELETE	332.	699S02-92
* 308.	DELETE	333.	699S02-93
* 309.	DELETE	334.	699S02-94
* 310.	DELETE	* 335.	DELETE
* 311.	DELETE	336.	697S01-7
312.	699S02-32	337.	697S01-8
313.	699S02-33	338.	697S01-22
314.	699S02-34	339.	697S01-26
315.	699S02-57	340.	7042-ED2374
316.	699S02-58	341.	7021-EC2399
317.	699S02-75 & 61	* 342.	DELETE
318.	699S02-79	* 343.	DELETE
319.	699S02-81		
320.	699S02-82		
321.	699S02-83		
322.	699S02-84		
323.	699S02-85		
324.	699S02-86		
325.	699S02-87		

REINSPECTION FCR & PW RESOLUTIONS  
 REQUIRED FOR HVAC, CABLE TRAY  
 AND CONDUIT SUPPORT HANGERS

ELECTRICALHVAC

PW-AS-152 Rev. 2  
 \* PW-AS-218 Rev. 2  
 FCR-AS-334 Rev. 1  
 PW-AS-346  
 PW-AS-347  
 PW-AS-349 Rev. 1  
 \* FCR-AS-350  
 PW-AS-354  
 PW-AS-356  
 FCR-AS-372 Rev. 1  
 PW-AS-380  
 PW-AS-391  
 PW-AS-392 Rev. 1  
 PW-AS-414  
 FCR-AS-394  
 FCR-AS-395  
 FCR-AS-396  
 FCR-AS-397  
 \* PW-AS-398  
 PW-AS-399  
 PW-AS-400  
 PW-AS-401  
 PW-AS-402  
 PW-AS-403  
 PW-AS-404  
 FCR-AS-405  
 FCR-AS-414  
 FCR-AS-436  
 PW-AS-440  
 PW-AS-441  
 PW-AS-442  
 PW-AS-443

FCR-AS-334 Rev. 1  
 FCR-AS-349 Rev. 1  
 FCR-AS-372 Rev. 1  
 FCR-AS-372 Rev. 1  
 FCR-AS-380  
 FCR-AS-392 Rev. 1  
 FCR-AS-446  
 FCR-AS-483  
 PW-AS-508  
 PW-AS-509  
 PW-AS-510  
 PW-AS-511

ELECTRICAL (cont'd)

PW-AS-444	DCN-560-061
PW-AS-445	DCN-560-071
PW-AS-446	DCN-560-083
PW-AS-447	DCN-650-366
PW-AS-481	DCN-560-086
FCR-AS-483	* FCR-E-042
PW-AS-489	* FCR-E-022
FCR-AS-496	* FCR-E-093
PW-AS-497	* FCR-E-083
PW-AS-499	* FCR-E-079
PW-AS-500	* DCN-650-558
PW-AS-519	
PW-AS-520	
PW-AS-521	
PW-AS-522	
PW-AS-523	
FCR-AS-524	
PW-AS-527	
PW-AS-541	
PW-AS-546	
PW-AS-547	
DCN-650-406	
FCR-E-078	
DCN-560-076	
FCR-E-041	
FCR-E-060	
PW-AS-215	
PW-AS-152 Rev. 1	
FCR-AS-314 Rev. 1	
FCR-AS-372 Rev. 1	
DCN-560-026	
DCN-560-033	
DCN-560-043	



UNITED STATES  
 NUCLEAR REGULATORY COMMISSION  
 REGION II  
 101 MARIETTA ST., N.W., SUITE 3100  
 ATLANTA, GEORGIA 30303

Report Nos. 50-400/81-12, 50-401/81-12, 50-402/81-12 and 50-403/81-12

Licensee: Carolina Power and Light Company  
 411 Fayetteville Street  
 Raleigh, NC 27602

Facility Name: Shearon Harris

Docket Nos. 50-400, 50-401, 50-402 and 50-403

License Nos. CPPR-158, CPPR-159, CPPR-160 and CPPR-161

Inspection at Harris site near Raleigh, North Carolina

Inspector: C. Julian for 7/1/81  
 G. F. Maxwell, Senior Resident Inspector Date Signed

Approved by: C. Julian 7/1/81  
 C. A. Julian, Acting Section Chief, Division of Date Signed  
 Resident and Reactor Project Inspection

SUMMARY

Inspection on May 20 - June 20, 1981

Areas Inspected

This routine, inspection involved 87 resident inspector-hours onsite in the areas of followup on previously identified items; equipment handling and storage, Units 1-4; concrete and soil, Units 1-4 and welding, Units 1-2.

Results

Of the four areas inspected, no violations or deviations were identified.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*S. D. Smith, Vice President, Construction
- \*R. M. Parsons, Site Manager
- \*N. J. Chiangi, Manager Engineering and Construction QA/QC
- \*G. L. Forehand, Director QA/QC
- \*A. M. Lucas, Senior Resident Engineer
- \*B. Seyler, Principal Civil Engineer
- \*D. C. Whitehead, Senior QA/QC Specialist
- \*L. E. James, Principal QA Engineer
- \*E. L. Betz, Project QA Specialist
- \*R. Hanford, Principal Engineer - Welding
- \*T. J. Wait, QA/QC Specialist

Other licensee employees contacted included 30 construction craftsmen, 10 technicians and 15 office personnel.

#### Other Organizations

- \*W. D. Goodman, Daniel Construction Company Project Manager
- \*J. Kirk, Daniel Construction Company Assistant Project Manager

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on May 29 and June 19, 1981, with those persons indicated in paragraph 1 above.

### 3. Licensee Action on Previous Inspection Findings

- a. (Closed) Deficiency 400/80-17-01; 401, 402, 403/80-15-01: "Failure to minimize onsite road dust generated by routine construction activities and vehicular traffic." CP&L letter of response dated October 23, 1980, and RII letter to CP&L dated October 28, 1980, and results of telephone conversation on October 17, 1980, and subsequent observations by the onsite USNRC resident inspector reveals that sufficient corrective action has been taken to provide the necessary water for minimizing onsite road dust. This item is closed.
- b. (Closed) Infraction 400/80-22-01: "Failure to correctly translate and implement codes and standards for special processes." CP&L letters of response dated December 9, 1980, and subsequent evaluations of the responses reveal that sufficient corrective action has been taken to provide adequate control of the installation and inspection of pipe hangers as they relate to the above listed infraction. This item is

closed; however, during subsequent RII inspections the implementation of CP&L's corrective action to avoid further noncompliances will be closely monitored.

#### 4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. New unresolved items identified during this inspection are discussed in paragraph 7.d.

#### 5. Equipment Handling and Storage Units 1-4

- a. The inspector observed the stored condition of the reactor vessel for Units 1 - 4, the steam generators for Units 1-2 and the Unit 1 pressurizer.
- b. The inspector observed portions of the receipt inspection, storage and the rigging for off-loading of emergency diesel generator engine serial number 740462643.

In the areas inspected, no violations or deviations were identified.

#### 6. Concrete and Soil, Units 1-4

- a. The inspector observed portions of concrete placements being made in: Unit 1 containment building (pour numbered 1CBXW240001); reactor auxiliary common building, (pour numbered 2RASL236009).

The concrete forms were tight, clean and level. Activities pertaining to delivery time, free fall, consolidation and testing conformed to specification requirements, concrete placement activities were continuously monitored by inspection personnel.

- b. The inspector toured the storage areas for the concrete batch plant cement and aggregate stock piles. The inspector questioned the cleanliness of the number four stone; CP&L QA personnel ran an information only wash test (ASTM C-117) on the aggregate in question. The results of the test indicated that the aggregate did not contain excessive clay or other aggregate particles.
- c. The inspector toured the concrete test lab and observed the stored condition of the concrete test cylinders in the curing room. A set of cylinders was randomly selected by the inspector (from pour number 2RASL236009); the documentation for the cylinders showed the correct identification and revealed acceptable compressive strength test results.
- d. The inspector observed soil backfill operations and the test results for the soil being placed onto the service water piping located North-West of Unit 2 containment (N2310-2355/W1755-1820).

- e. The inspector observed the in-process structural inspections of the main and west auxiliary dams, spillways, piezometers, settlement monuments and dam outlet channel. The inspections were conducted by the design engineer (EBASCO) and CP&L representatives for compliance with Regulatory Guide 1.127 and EBASCO specification CAR-SH-CH-24.

In the areas inspected, no violations or deviations were identified.

7. Welding - Units 1 and 2

- a. The inspector observed the inspections and the as found conditions for the following weld joints:
- (1) 1-SW-521-FW-1776 (observed fit-up)
  - (2) 5-FP-101-SW-1 (observed final visual)
  - (3) 1-BR-136-FW-486 (observed purge)
  - (4) 2-SC-1-FW-16 (observed final visual)
  - (5) 2-SC-1-FW-12 (observed final visual)
- b. The inspector participated in a site inspection conducted by another RII inspector; the inspection involved: observation of in-process ASME Section III, Class two and three welds; observation of class 1E cable tray supports and observation of as found condition of structural welds. The results of the inspection are documented in RII reports numbered 50-400, 401, 402, 403/81-11.
- c. The inspector selected ten controlled documents which were being utilized by craft personnel for the installation of electrical class 1E raceway supports. The documents were found to be of the most current revisions and contained sufficient details required to conduct the installations.
- d. The inspector observed the as found condition of stud welds which were installed for the purpose of fastening class 1E conduit pull boxes into their support brackets (boxes numbered B 1415SB, B1414SB, B1397SB and B1537SB). The inspector questioned site CP&L engineering and inspection personnel concerning the type fasteners to be utilized to fasten the conduit pull boxes to the installed studs. As a result; the inspector was not shown nor could site CP&L personnel provide the design information (drawing or specification) to be followed in selecting and installing the fasteners (nuts) for Class 1E seismic I mounted conduit pull boxes. This is an unresolved item (50-400/81-12-01).

In the areas inspected, no violations or deviations were identified.

440.49

(6.3)

Provide a discussion of methods used to insure that the ECC system is placed and maintained in a water filled condition to preclude the effects of water hammer.

Response:

ECCS piping is designed such that normal system operation and testing assures that the systems remain water-filled to preclude the effects of water hammer. Interfaces with normally pressurized non-ECCS systems preclude a loss of water from ECCS systems. Leakage from ECCS systems through valve packing, pump seals, etc., will be detected by a number of methods including: 1) normal operator rounds, 2) performance during testing, 3) the plant leak reduction inspection program, 4) various sump level alarms, 5) decreasing water levels in various tanks. Should significant leakage be discovered, where an introduction of air into the system could have occurred, provisions have been made in the system design to permit refilling and venting of the affected components or piping following repair to the source of leakage.

DOCKETED  
USNRC

January 31, 1983

'83 FEB -3 P2:52

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

APPLICANTS' INTERROGATORIES  
AND REQUEST FOR PRODUCTION OF DOCUMENTS  
TO INTERVENOR CHANGE (FIRST SET)

Pursuant to 10 C.F.R. §§ 2.740b and 2.741 and to the Atomic Safety and Licensing Board's "Memorandum and Order (Reflecting Decisions Made Following Prehearing Conference)" of September 22, 1982, Carolina Power & Light Company and North Carolina Eastern Municipal Power Agency hereby request that Intervenor Chapel Hill Anti-Nuclear Group/Environmental Law Project ("CHANGE") answer separately and fully in writing, and under oath or affirmation, each of the following interrogatories, and produce and permit inspection and copying of the original or best copy of all documents identified in the response to interrogatories below.

Under the Commission's Rules of Practice, answers or objections to these interrogatories must be served within 14 days after service of the interrogatories; responses or objections to the request for production of documents must be served within 30 days after service of the request.

These interrogatories are intended to be continuing in nature, and the answers should promptly be supplemented or amended as appropriate, pursuant to 10 C.F.R. § 2.740(e), should CHANGE or any individual acting on its behalf obtain any new or differing information responsive to these interrogatories. The request for production of documents is also continuing in nature and CHANGE must produce immediately any additional documents CHANGE, or any individual acting on its behalf, obtains which are responsive to the request, in accordance with the provisions of 10 C.F.R. § 2.740(e).

Where identification of a document is requested, briefly describe the document (e.g., book, letter, memorandum, transcript, report, handwritten notes, test data) and provide the following information as applicable: Document name, title, number, author, date of publication and publisher, addressee, date written or approved, and the name and address of the person or persons having possession of the document. Also state the portion or portions of the document (whether section(s), chapter(s), or page(s)) upon which you rely.

Definitions. As used hereinafter, the following definitions shall apply:

The "ER" is the Environmental Report - Operating License Stage for the Shearon Harris Nuclear Power Plant, as amended.

The "FSAR" is the Final Safety Analysis Report for the Shearon Harris Nuclear Power Plant, as amended.

"Applicants" is intended to encompass Carolina Power & Light Co., North Carolina Eastern Municipal Power Agency and their contractors for the Harris Plant.

"Document(s)" means all writings and records of every type in the possession, control or custody of CHANGE or any individual acting on its behalf, including, but not limited to, memoranda, correspondence, reports, surveys, tabulations, charts, books, pamphlets, photographs, maps, bulletins, minutes, notes, speeches, articles, transcripts, voice recordings and all other writings or recordings of any kind; "document(s)" shall also mean copies of documents even though the originals thereof are not in the possession, custody, or control of CHANGE, a document shall be deemed to be within the "control" of CHANGE or any individual acting on its behalf if they have ownership, possession or custody of the document or copy thereof, or have the right to secure the document or copy thereof, from any person or public or private entity having physical possession thereof.

## General Interrogatories

1(a). State the name, present or last known address, and present or last known employer of each person known to CHANGE to have first-hand knowledge of the facts alleged, and upon which CHANGE relied in formulating allegations, in each of the contentions which are the subject of this set of interrogatories.

(b). Identify those facts concerning which each such person has first-hand knowledge.

(c). State the specific allegation in each contention which CHANGE contends such facts support.

2(a). State the name, present or last known address, and present or last employer of each person, other than affiant, who provided information upon which CHANGE relied in answering each interrogatory herein.

(b). Identify all such information which was provided by each such person and the specific interrogatory response in which such information is contained.

3(a). State the name, address, title, employer and educational and professional qualifications of each person CHANGE intends to call as an expert witness or a witness relating to any contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) regarding which each such person is expected to testify.

(c). State the subject matter to which each such person is expected to testify.

4(a). Identify all documents in CHANGE's possession, custody or control, including all relevant page citations, pertaining to the subject matter of, and upon which CHANGE relied in formulating allegations in each contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) to which each such document relates.

(c). State the specific allegation in each contention which CHANGE contends each document supports.

5(a). Identify all documents in CHANGE's possession, custody or control, including all relevant page citations, upon which CHANGE relied in answering each interrogatory herein.

(b). Identify the specific interrogatory response(s) to which each such document relates.

6(a). Identify any other source of information, not previously identified in response to Interrogatory 2 or 5, which was used in answering the interrogatories set forth herein.

(b). Identify the specific interrogatory response(s) to which each such source of information relates.

7(a). Identify all documents which CHANGE intends to offer as exhibits during this proceeding to support the contentions which are the subject of this set of interrogatories or which CHANGE intends to use during cross-examination of witnesses presented by Applicants and/or the NRC Staff on each contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) to which each document relates and the particular page citations applicable to each contention.

Interrogatories on Contention 44  
(Reactor Vessel Level Instrumentation System)

44-1. Westinghouse has developed a Reactor Vessel Level Instrumentation System ("RVLIS"), suitable for installation in operating plants and plants under construction, to meet the recommendation of Item II.F.2 of NUREG-0737 (TMI Action Plan) for additional instrumentation to detect inadequate core cooling. The RVLIS is designed to provide a relatively simple and straight forward means to monitor the water level in the reactor vessel, and serves to provide additional information to the operator during accident conditions. The RVLIS utilizes differential pressure (d/p) measuring devices to indicate water

level and relative void content of the circulating primary coolant system fluid. The NRC Staff's review, which accepts the Westinghouse RVLIS, is reported in NUREG/CR-2628. If Applicants commit to install the Westinghouse RVLIS at SHNPP, is your Contention 44 satisfied? If not, explain in detail the basis for the answer.

44-2. If Applicants commit to install the Westinghouse RVLIS at SHNPP, will CHANGE voluntarily withdraw Contention 44? If not, explain in detail the basis for the answer.

Interrogatories on Contention 79(c) (Regulatory Costs)

79(c)-1. Section 8.2.2.1.a of the ER (Amend. 5) contains estimates of the regulatory costs, at both the state and federal levels, associated with the Harris Plant. Does the provision of this information in the ER satisfy your Contention 79(c)? If not, explain in detail the basis for the answer.

79(c)-2. If the answer to the preceding interrogatory is affirmative, will CHANGE voluntarily withdraw Contention 79(c)? If not, explain in detail the basis for the answer.

REQUEST FOR PRODUCTION OF DOCUMENTS

Applicants request that CHANGE respond in writing to this request for production of documents and produce the original or best copy of each of the documents identified or described in

the answers to each of the above interrogatories at a place mutually convenient to the parties.

Respectfully submitted,

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DATED: January 31, 1983

DOCKETED  
USNRC

January 31, 1983

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

APPLICANTS' INTERROGATORIES  
AND REQUEST FOR PRODUCTION OF DOCUMENTS  
TO JOINT INTERVENORS (FIRST SET)

Pursuant to 10 C.F.R. §§ 2.740b and 2.741 and to the Atomic Safety and Licensing Board's "Memorandum and Order (Reflecting Decisions Made Following Prehearing Conference)" of September 22, 1982, Carolina Power & Light Company and North Carolina Eastern Municipal Power Agency hereby request that Joint Intervenors (CHANGE, CCNC, Kudzu Alliance and Wells Eddleman) answer separately and fully in writing, and under oath or affirmation, each of the following interrogatories, and produce and permit inspection and copying of the original or best copy of all documents identified in the responses to interrogatories below. In accordance with informal discussions held among the parties, Applicants request that Joint

Intervenors serve a single, consolidated set of answers and responses to these discovery requests.

Under the Commission's Rules of Practice, answers or objections to these interrogatories must be served within 14 days after service of the interrogatories; responses or objections to the request for production of documents must be served within 30 days after service of the request.

These interrogatories are intended to be continuing in nature, and the answers should promptly be supplemented or amended as appropriate, pursuant to 10 C.F.R. § 2.740(e), should Joint Intervenors or any individual acting on their behalf obtain any new or differing information responsive to these interrogatories. The request for production of documents is also continuing in nature and Joint Intervenors must produce immediately any additional documents they, or any individual acting on their behalf, obtain which are responsive to the request, in accordance with the provisions of 10 C.F.R. § 2.740(e).

Where identification of a document is requested, briefly describe the document (e.g., book, letter, memorandum, transcript, report, handwritten notes, test data) and provide the following information as applicable: Document name, title, number, author, date of publication and publisher, addressee, date written or approved, and the name and address of the person or persons having possession of the document. Also

state the portion or portions of the document (whether section(s), chapter(s), or page(s)) upon which Joint Intervenors rely.

Definitions. As used hereinafter, the following definitions shall apply:

The "ER" is the Environmental Report - Operating License Stage for the Shearon Harris Nuclear Power Plant, as amended.

The "FSAR" is the Final Safety Analysis Report for the Shearon Harris Nuclear Power Plant, as amended.

"Applicants" is intended to encompass Carolina Power & Light Co., North Carolina Eastern Municipal Power Agency and their contractors for the Harris Plant.

"Joint Intervenors" is intended to encompass the following organizations and individuals, jointly and severally: Chapel Hill Anti-Nuclear Group Effort, the Environmental Law Project, the Conservation Council of North Carolina and the Kudzu Alliance, as organizations, their members, and their representatives, and Mr. Wells Eddleman.

"Document(s)" means all writings and records of every type in the possession, control or custody of Joint Intervenors or any individual acting on their behalf, including, but not limited to, memoranda, correspondence, reports, surveys, tabulations, charts, books, pamphlets, photographs, maps, bulletins, minutes, notes, speeches, articles, transcripts, voice recordings and all other writings or recordings of any

kind; "document(s)" shall also mean copies of documents even though the originals thereof are not in the possession, custody, or control of Joint Intervenors, a document shall be deemed to be within the "control" of Joint Intervenors or any individual acting on their behalf if they have ownership, possession or custody of the document or copy thereof, or have the right to secure the document or copy thereof, from any person or public or private entity having physical possession thereof.

#### GENERAL INTERROGATORIES

1(a). State the name, present or last known address, and present or last known employer of each person known to Joint Intervenors to have first-hand knowledge of the facts alleged, and upon which Joint Intervenors relied in formulating allegations, in each of the contentions which are the subject of this set of interrogatories.

(b). Identify those facts concerning which each such person has first-hand knowledge.

(c). State the specific allegation in each contention which Joint Intervenors contend such facts support.

2(a). State the name, present or last known address, and present or last employer of each person, other than affiant, who provided information upon which Joint Intervenors relied in answering each interrogatory herein.

(b). Identify all such information which was provided by each such person and the specific interrogatory response in which such information is contained.

3(a). State the name, address, title, employer and educational and professional qualifications of each person Joint Intervenors intend to call as an expert witness or a witness relating to any contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) regarding which each such person is expected to testify.

(c). State the subject matter to which each such person is expected to testify.

4(a). Identify all documents in Joint Intervenors' possession, custody or control, including all relevant page citations, pertaining to the subject matter of, and upon which Joint Intervenors relied in formulating allegations in each contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) to which each such document relates.

(c). State the specific allegation in each contention which Joint Intervenors contend each document supports.

5(a). Identify all documents in Joint Intervenors' possession, custody or control, including all relevant page

citations, upon which you relied in answering each interrogatory herein.

(b). Identify the specific interrogatory response(s) to which each such document relates.

6(a). Identify any other source of information, not previously identified in response to Interrogatory 2 or 5, which was used in answering the interrogatories set forth herein.

(b). Identify the specific interrogatory response(s) to which each such source of information relates.

7(a). Identify all documents which Joint Intervenors intend to offer as exhibits during this proceeding to support the contentions which are the subject of this set of interrogatories or which Joint Intervenors intend to use during cross-examination of witnesses presented by Applicants and/or the NRC Staff on each contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) to which each document relates and the particular page citations applicable to each contention.

INTERROGATORIES ON JOINT CONTENTION IV (TLDs)

IV-1(a). Describe in detail the additional personnel radiation exposure monitoring instruments (including range, sensitivity and qualifications) which Joint Intervenors contend are necessary in order to assure the protection of worker safety and health at the Harris Plant.

(b). State in detail all facts which support Joint Intervenors' contention that the instruments identified in the answer to the preceding interrogatory are necessary.

IV-2(a). Do Joint Intervenors contend that thermoluminescent dosimeters ("TLDs") are inadequate to measure cumulative radiation doses as required by 10 C.F.R. Part 20?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to Interrogatory IV-2(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Joint Contention IV.

IV-3(a). Do Joint Intervenors contend that portable pressurized ionization monitors are capable of measuring cumulative radiation doses as required by 10 C.F.R. Part 20?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to Interrogatory IV-3(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Joint Contention IV.

IV-4(a). As discussed in FSAR §§ 12.5.3.2.2.2 and 12.5.3.6.1.1, self-reading dosimeters will be utilized, as necessary, for both specific job exposure evaluations and to indicate current individual exposure status. Do Joint Intervenors contend that these self-reading dosimeters do not provide workers with a real-time radiation exposure monitoring capability?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to Interrogatory IV-4(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Joint Contention IV.

IV-5(a). Do Joint Intervenors contend that the self-reading dosimeters, discussed in FSAR §§ 12.5.3.2.2.2 and 12.5.3.6.1.1, are inadequate to assure worker safety and health in radiation hazard areas?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to Interrogatory IV-5(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Joint Contention IV.

IV-6(a). Do Joint Intervenors contend that the monitoring ranges of the self-reading dosimeters, described in FSAR § 12.5.2.1.7.4, are inadequate to protect worker safety and health?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to Interrogatory IV-6(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Joint Contention IV.

IV-7(a). Do Joint Intervenors contend that the self-reading dosimeters, discussed in FSAR §§ 12.5.3.2.2.2 and 12.5.3.6.1.1, are inadequate to corroborate the exposures indicated by TLDs?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to Interrogatory IV-7(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Joint Contention IV.

INTERROGATORIES ON JOINT CONTENTION V  
(AIR MONITORS AND SAMPLERS)

V-1(a). Would a commitment by Applicants to meet the provisions of NRC Regulatory Guide 8.25 (relevant pages attached hereto as Appendix 1) regarding calibration frequency satisfy Joint Intervenors' concerns with respect to the issue of the frequency at which the continuous air monitors and portable air samplers will be calibrated?

(b). If the answer to the preceding interrogatory is negative, state in detail the basis for Joint Intervenors' disagreement with the Regulatory Guide 8.25 provisions regarding calibration frequency.

(c). If the answer to Interrogatory V-1(a) is affirmative, will Joint Intervenors voluntarily withdraw Joint Contention V? If not, explain in detail the basis for the answer.

V-2(a). If the answer to Interrogatory V-1(a) is negative, identify the frequency at which Joint Intervenors contend that the portable air samplers and continuous air monitors must be calibrated.

(b). State in detail all facts which support Joint Intervenors' contention that the portable air samplers and continuous air monitors must be calibrated at the frequency identified in the answer to the preceding interrogatory.

V-3(a). Do Joint Intervenors contend that the portable air samplers and continuous air monitors are required to be accurate within plus or minus 5%?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to Interrogatory V-3(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Joint Contention V.

V-4(a). Do Joint Intervenors contend that NRC Regulatory Guide 8.25 is inadequate in allowing for a cumulative error in airflow calibrations of less than 20%?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to Interrogatory V-4(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Joint Contention V.

INTERROGATORIES ON JOINT CONTENTION VI  
(RADIATION DETECTION AND MONITORING)

VI-1. FSAR § 11.5.2.5 describes the types of radiation detectors to be used in the Harris Plant Radiation Monitoring System ("RMS"). With respect to each detector type identified therein, identify any alleged inadequacies of the detector type in question.

VI-2(a). Do Joint Intervenors contend that the alleged inadequacies identified in the answer to the preceding interrogatory will prevent the RMS from carrying out its intended function?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to Interrogatory VI-2(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Joint Contention VI.

VI-3(a). FSAR § 11.5.2. also identifies the types and amounts of radiation which will be monitored by each type of detector. Do Joint Intervenors contend that other specific radionuclides must be identified and monitored by the RMS?

(b). If the answer to the preceding interrogatory is affirmative, identify each specific additional radionuclide

which Joint Intervenors contend must be identified and monitored by the RMS.

(c). For each specific radionuclide identified in the answer to the preceding interrogatory, state

(i). the basis for Joint Intervenors' contention that such radionuclides must be identified and monitored; and

(ii). the additional protective actions which could be undertaken based upon knowledge of the concentration and/or release of each such radionuclide beyond those actions which would be initiated based on information derived from the RMS as currently designed.

VI-4(a). FSAR § 11.5.2.7 describes the Process and Effluent Radiological Monitors, monitor locations and associated read-outs and alarms. Do Joint Intervenors contend that additional monitors are required in order to determine process and effluent radiological concentrations and/or releases?

(b). If the answer to the preceding interrogatory is affirmative, identify the type and proposed location of the additional monitors which Joint Intervenors contend are required.

(c). State in detail all facts which support Joint Intervenors' contention that the additional monitors identified in the answer to the preceding interrogatory are required.

(d). If the answer to Interrogatory VI-4(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Joint Contention VI.

VI-5(a). Do Joint Intervenors contend that the read-outs and alarms associated with the Process and Effluent Radiological Monitors are inadequate?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to Interrogatory VI-5(a) is affirmative, identify the additional read-outs and alarms for the Process and Effluent Radiological Monitors which Joint Intervenors contend are required.

(d). If the answer to Interrogatory VI-5(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Joint Contention VI.

VI-6(a). FSAR § 12.3.4.1 describes the Area Radiation Monitoring System, monitor locations and associated read-outs and alarms. Do Joint Intervenors contend that the Area Radiation Monitoring System is inadequate to accomplish its intended purposes, as set out in FSAR § 12.3.4.1.1?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to Interrogatory VI-6(a) is affirmative, describe in detail all modifications to the Area Radiation Monitoring System which Joint Intervenors contend are required.

(d). If the answer to Interrogatory VI-6(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Joint Contention VI.

VI-7(a). FSAR § 12.3.4.2 describes the Airborne Radiation Monitoring System, monitor locations and associated read-outs and alarms. Do Joint Intervenors contend that the Airborne Radiation Monitoring System is inadequate to accomplish its intended purposes, as set out in FSAR § 12.3.4.2.1?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

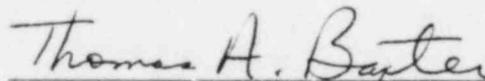
(c). If the answer to Interrogatory VI-7(a) is affirmative, describe in detail all modifications to the Airborne Radiation Monitoring System which Joint Intervenors contend are necessary.

(d). If the answer to Interrogatory VI-7(a) is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Joint Contention VI.

REQUEST FOR PRODUCTION OF DOCUMENTS

Applicants request that Joint Intervenors respond in writing to this request for production of documents and produce the original or best copy of each of the documents identified or described in the answers to each of the above interrogatories at a place mutually convenient to the parties.

Respectfully submitted,



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Dated: January 31, 1983



# REGULATORY GUIDE

OFFICE OF STANDARDS DEVELOPMENT

RECEIVED AUG 25 1980

REGULATORY GUIDE 8.25

(Task OH 905-4)

## CALIBRATION AND ERROR LIMITS OF AIR SAMPLING INSTRUMENTS FOR TOTAL VOLUME OF AIR SAMPLED

### A. INTRODUCTION

Paragraph (a)(3) of § 20.103, "Exposure of Individuals to Concentrations of Radioactive Materials in Air in Restricted Areas," of 10 CFR Part 20, "Standards for Protection Against Radiation," requires that licensees use suitable measurements of concentrations of radioactive materials in air for detecting and evaluating airborne radioactivity in restricted areas. In addition, paragraph (c)(4) of § 20.106, "Radioactivity in Effluents to Unrestricted Areas," requires that licensees provide information as to the highest concentration of each radionuclide in an unrestricted area, a procedure that in many cases requires air monitoring beyond the restricted area. This guide identifies methods acceptable to the NRC staff for calibrating air sampling instruments for total volume of air sampled and provides guidance for ensuring that volumes of air sampled are known within certain limits.

### B. DISCUSSION

In order to accurately assess the air concentration of radioactive materials in a given location, the volume of air sampled as well as the quantity of contaminant in the sample must be determined. Accurate determination of the volume of air sampled requires standard, reproducible, and frequent calibration of the air metering devices that are used with air sampling instruments.

The American Conference of Governmental Industrial Hygienists has published a manual entitled "Air Sampling Instruments for Evaluation of Atmospheric Contaminants,"<sup>1</sup> 5th Edition, 1978. Part II, Section I, "Calibration of Air Sampling Instruments," of this manual provides instructions for acceptable methods of calibrating air volume and flow rate metering devices. In particular, Tables II, III, and

<sup>1</sup>Copies are available from the American Conference of Governmental Industrial Hygienists, P.O. Box 1937, Cincinnati, Ohio 45201.

IV of this manual provide sources of published, recommended, or standard methods; a summary of recommended standard methods; and a listing of calibration instruments and their suppliers.

This guide supplements the instructions in this manual by adding guidance for frequency of calibration, for acceptable error limits in volume measurement, and for documentation.

### C. REGULATORY POSITION

The publication entitled "Air Sampling Instruments for Evaluation of Atmospheric Contaminants,"<sup>1</sup> 5th Edition, 1978, provides guidance on total air sample volume calibration methods acceptable to the NRC staff, as supplemented below:

#### 1. FREQUENCY OF CALIBRATION

A licensee committed to a routine or emergency air sampling program should perform an acceptable calibration of all airflow or volume metering devices at least once every 6 months, with the exception of permanently installed effluent monitors.<sup>2</sup> Special calibrations should be performed at any time there is reason to believe that the operating characteristics of a metering device have been changed, by repair or alteration, or whenever system performance is observed to have changed significantly. Routine instrument maintenance should be performed as recommended by the manufacturer. Primary or secondary standard instruments used to calibrate air sampling instruments should be inspected frequently for consistency of performance.

<sup>2</sup>See NUREG-0472, "Radiological Effluent Technical Specifications for PWRs," July 1979, and NUREG-0473, "Radiological Effluent Technical Specifications for BWRs," July 1979, which specify calibration at least once every 18 months.

#### USNRC REGULATORY GUIDES

Regulatory Guides are issued to describe and make available to the public methods acceptable to the NRC staff of implementing specific parts of the Commission's regulations, to delineate techniques used by the staff in evaluating specific problems or postulated accidents, or to provide guidance to applicants. Regulatory Guides are not substitutes for regulations, and compliance with them is not required. Methods and solutions different from those set out in the guides will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the Commission.

Comments and suggestions for improvements in these guides are encouraged at all times, and guides will be revised, as appropriate, to accommodate comments and to reflect new information or experience. This guide was revised as a result of substantive comments received from the public and additional staff review.

Comments should be sent to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch.

The guides are issued in the following ten broad divisions:

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| 1. Power Reactors                 | 6. Products                       |
| 2. Research and Test Reactors     | 7. Transportation                 |
| 3. Fuels and Materials Facilities | 8. Occupational Health            |
| 4. Environmental and Siting       | 9. Antitrust and Financial Review |
| 5. Materials and Plant Protection | 10. General                       |

Copies of issued guides may be purchased at the current Government Printing Office price. A subscription service for future guides in specific divisions is available through the Government Printing Office. Information on the subscription service and current GPO prices may be obtained by writing the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Publications Sales Manager.

## 2. ERROR LIMIT FOR MEASUREMENT OF AIR SAMPLE VOLUME

Most methods of calibrating airflow or air volume metering devices require direct comparison to a primary or secondary standard instrument to determine a calibration curve or a correction factor. An example of a primary standard is a spirometer that measures total air volume directly with high precision by liquid displacement. An example of a secondary standard is a wet-test meter that has been calibrated against a primary standard. Primary standards are usually accurate to within 1 percent and secondary standards to within 2 percent.

The significant errors associated with determining the total air volume sampled are:

- $E_c$ : The error in determining the calibration factor. (An acceptable estimate is the percent error associated with the standard instrument used in the calibration.)<sup>3</sup>
- $E_s$ : Intrinsic error in reading the meter scale. (An acceptable estimate is the percent equivalent of one-half of the smallest scale division compared to the scale reading.)
- $E_t$ : The percent error in measurement of sampling time that should be kept within 1 percent.
- $E_v$ : The most probable value of the cumulative percent error in the determination of the total air volume sampled.

$E_v$  can be calculated from the following equation provided there are no additional significant sources of errors:

$$E_v = [E_s^2 + E_c^2 + E_t^2]^{1/2}$$

Air sampling instruments, including those personal (lapel) samplers that have flow rate meters, should have flow rate or total volume metering devices calibrated so that the most probable value of the cumulative error  $E_v$ , in

<sup>3</sup>The calibration factor should be based on two kinds of determinations. First, correction factors should be determined at several flow rates distributed over the full-scale range. Each flow rate correction factor should be determined while adjusting flow rates upscale and again while adjusting flow rates downscale, and the two sets of data should be compared. Second, subsequent calibrations should compare the new correction factors to those determined during the previous calibration. If observed differences are significant compared to the overall volume error limit of 20 percent, an additional error term should be included in the calculation above.

the determination of total volume, is less than 20 percent. This analysis assumes a linear change in the flow rate across the sample collector during the sampling period when flow rate meters are used. In turn, this assumption allows simple averaging of the initial and final flow rates for a single sample.

If there are significant differences in pressure and temperature between the calibration site and the sampling site, appropriate corrections should be made using the ideal gas laws as discussed in the previously described manual.

A sample calculation of the most probable value of the cumulative error in total volume measured is as follows: If accuracies of the scale reading, the calibration factor, and sample time are  $\pm 4$ , 2, and 1 percent, respectively, and there are no other significant sources of error, the cumulative error would be:

$$E_v = [4^2 + 2^2 + 1^2]^{1/2} = 4.58\% \text{ or } \sim 5\%$$

## 3. DOCUMENTATION OF CALIBRATION OF AIR METERING DEVICES

The licensee should maintain records of all routine and special calibrations of airflow or volume metering devices, including the primary or secondary standard used, method employed, and estimates of accuracy of the calibrated metering devices. All instruments should be clearly labeled as to the date and results of the most recent calibration and should include the appropriate correction factors to be used.

### D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the NRC staff's plans for using this regulatory guide.

Except in those cases in which an applicant or licensee proposes an acceptable alternative method for complying with §§20.103 and 20.106 of the Commission's regulations, the staff will use the method described herein in the evaluation of ongoing and proposed air monitoring programs after November 15, 1980.

If an applicant or licensee wishes to use the method described in this regulatory guide on or before November 15, 1980, the pertinent portions of the application or the licensee's performance will be evaluated on the basis of this guide.

## VALUE/IMPACT STATEMENT

### 1. PROPOSED ACTION

#### 1.1 Description

Many NRC licensees are required to maintain radiation and contamination survey programs, including air sampling, to assess concentrations of airborne radionuclides. Regulatory concentration values are specified in Appendix B to 10 CFR Part 20. The proposed action is to provide guidance for improving air sampling procedures in the form of acceptable methods of calibrating air sampling instruments for determining total volume of air sampled, frequency of calibration, and documentation procedures. Measurement of the total volume is required in the calculation of the concentration.

#### 1.2 Need for Proposed Action

In order to accurately characterize the air quality of a working environment, the volume of air sampled as well as the quantity of contaminant must be determined. Accurate assessment of the quantity of air sampled requires frequent calibration of air metering devices by standard, reproducible methods. To assess internal exposure resulting from airborne radioactive material and to evaluate working conditions, acceptable standard calibration and measurement methods must be developed. The Office of Nuclear Materials Safety and Safeguards requested the Office of Standards Development to accelerate the schedule for issuing guidance to NRC licensees on acceptable methods for total volume calibration and measurement.

#### 1.3 Value/Impact of Proposed Action

##### 1.3.1 NRC Operations

Acceptable methods for calibrating air sampling instruments provide additional criteria for inspection and enforcement of NRC radiation protection regulations. Increased accuracy in assessing airborne radioactive material concentrations would provide a more reliable data base for developing additional regulatory action to control and reduce internal radiation exposure. Impacts of the development of guidance as described include task completion manpower cost, estimated to be 0.3 man-year, and printing costs of approximately \$300.

##### 1.3.2 Other Government Agencies

Coordination with several governmental agencies (e.g., NBS, OSHA, EPA) has been necessary to ensure consistency in cases where respective regulatory and monitoring functions interface. Agreement States whose licensing regulations include air sampling requirements may benefit by the

availability of acceptable calibration methods suitable for adoption in their programs.

##### 1.3.3 Industry

The value to industry in providing guidance on air volume calibration procedures consists of the probable improvement in worker protection from more accurate assessment of airborne radioactive material hazards. The impacts include equipment and manpower costs that do not appear to be excessive in view of the proposed acceptable methods and frequency of calibration requirements. The staff estimates the initial cost of an acceptable calibration system to be less than \$300 and approximate man-power requirements to be 1 to 2 man-hours per year per instrument.

##### 1.3.4 Workers

For the workers, the values of improved air monitoring include more accurate assessments of the quality of the working environment and a probable reduction in internal radiation exposure. Recent staff discussion with union representatives indicates that there is an increasing concern about exposure to airborne radioactive material on the part of workers in the industry. Continued NRC efforts to increase our understanding of this aspect of radiation hazard and to improve monitoring and control of airborne radioactivity is essential.

##### 1.3.5 Public

Environmental monitoring to assess the release of radioactive materials in the vicinity of NRC-licensed facilities includes air sampling. Calibration procedures for low-flow-rate, continuous air sampling instruments will be included. The public will benefit from increased reliability of environmental measurements.

#### 1.4 Decision

The NRC should develop and provide guidance on acceptable total air volume calibration methods for those types of radiological air sampling instruments used by licensees.

### 2. TECHNICAL APPROACH

The action proposed here is to provide guidance on acceptable methods of calibrating airflow and air volume metering devices on radiological air samplers. Survey programs and, where appropriate, air monitoring programs are required of many NRC licensees. It is our intent that acceptable methods of air volume calibration be a required

component of licensee monitoring procedures. There are no technical alternatives to providing this guidance.

### 3. PROCEDURAL APPROACH

#### 3.1 Procedural Alternatives

The proposed action, to publish guidance on calibration procedures for radiological air sampling instruments, could be accomplished by several methods: publishing an NRC regulation requiring that specific calibration procedures be used by all licensees; preparing or revising a regulatory guide (based on the existing paragraph 20.201(b) of 10 CFR Part 20) that would provide an acceptable method for calibration; developing an ANSI standard on calibration procedures that could be endorsed by a new regulatory guide; or publishing a NUREG report or a branch position paper.

#### 3.2 Value/Impact of Procedural Alternatives

An *NRC regulation* establishes general legal requirements, is more costly and time consuming to prepare, and is not an appropriate vehicle for the specific and narrow objective proposed here. One advantage is that a regulation legally requires compliance. In general, this approach is not considered cost effective in view of the objective of the proposed action.

*ANSI standards* are generally intended as technical treatments of broad areas of concern to industry. An ANSI standard concerning all aspects of an acceptable monitoring program would be appropriate but beyond the narrower objective proposed here. Developing an ANSI standard and an endorsing regulatory guide might require several years and would be costly. This approach is not considered cost effective in view of the proposed objective.

A *NUREG report* would be an appropriate vehicle for reporting on technical studies of various methods of calibrating air samplers. Regulatory guidance, however, is not established through publication of a NUREG report. Since this proposal includes establishing an acceptable method for compliance with required surveying programs, a NUREG report is not considered suitable.

*Branch position* statements are intended as interim measures to be used when an immediate response is required. They are usually superseded when a more permanent mode of guidance is developed.

A *regulatory guide* can be prepared at reasonable cost within a reasonable time period. A regulatory guide can establish acceptable criteria for compliance with a regulatory requirement and, if incorporation into a license is requested, is subject to inspection and enforcement.

Development of a regulatory guide allows extensive input from all segments of the nuclear industry and the public. A

regulatory guide could reference existing and acceptable standard calibration methods or adequately describe calibration procedures acceptable to the NRC staff. The staff does not consider that revision of any existing regulatory guides could provide the objectives proposed here.

#### 3.3 Decision on Procedural Approach

The staff concludes that a regulatory guide adopting acceptable methods for total air volume calibration for radiological air sampling instruments should be published.

### 4. STATUTORY CONSIDERATIONS

#### 4.1 NRC Regulatory Authority

Paragraph 20.201(b) of 10 CFR Part 20 establishes a legal requirement that each licensee make or cause to be made such surveys as may be necessary for him to comply with the regulations. The NRC is thus authorized to provide criteria for acceptable survey methodology, including calibration of instrumentation.

#### 4.2 Need for NEPA Statement

The action proposed here is not considered to constitute a major addition or change and would entail no effect on the environment. The staff does not believe that an environmental impact statement is necessary.

### 5. RELATIONSHIP TO OTHER EXISTING OR PROPOSED REGULATIONS OR POLICIES

Several regulatory guides concerning health physics surveys at various types of NRC-licensed facilities such as Regulatory Guide 8.21, "Health Physics Surveys for Byproduct Material at NRC-Licensed Processing and Manufacturing Plants," are in preparation. These guides would appropriately reference the guide proposed here. In addition, guides such as Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants," will include a commitment to acceptable air sampler calibration procedures. When next revised, these guides should include cross-references to this guide as an acceptable element of a licensee's monitoring program.

The proposed guide is consistent with Regulatory Guide 8.8, "Information Relevant to Ensuring That Occupational Exposures at Nuclear Power Stations Will Be As Low As Is Reasonably Achievable." When next revised, Regulatory Guide 8.8 should include a cross-reference to this guide.

### 6. SUMMARY AND CONCLUSIONS

In summary, it is proposed that a regulatory guide be published for the purpose of providing guidance on acceptable methods of calibrating radiological air sampling instruments for total volume of air sampled.

DOCKETED  
USNRC

January 31, 1983

'83 FEB -3 P2:52

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' INTERROGATORIES  
AND REQUEST FOR PRODUCTION OF DOCUMENTS  
TO CONSERVATION COUNCIL OF NORTH CAROLINA (FIRST SET)

Pursuant to 10 C.F.R. §§ 2.740b and 2.741 and to the Atomic Safety and Licensing Board's "Memorandum and Order (Reflecting Decisions Made Following Prehearing Conference)" of September 22, 1982, Carolina Power & Light Company and North Carolina Eastern Municipal Power Agency hereby request that the Conservation Council of North Carolina ("CCNC") answer separately and fully in writing, and under oath or affirmation, each of the following interrogatories, and produce and permit inspection and copying of the original or best copy of all documents identified in the responses to interrogatories below.

Under the Commission's Rules of Practice, answers or objections to these interrogatories must be served within 14 days after service of the interrogatories; responses or

objections to the request for production of documents must be served within 30 days after service of the request.

These interrogatories are intended to be continuing in nature, and the answers should promptly be supplemented or amended as appropriate, pursuant to 10 C.F.R. § 2.740(e), should CCNC or any individual acting on its behalf obtain any new or differing information responsive to these interrogatories. The request for production of documents is also continuing in nature and CCNC must produce immediately any additional documents it, or any individual acting on its behalf, obtains which are responsive to the request, in accordance with the provisions of 10 C.F.R. § 2.740(e).

Where identification of a document is requested, briefly describe the document (e.g., book, letter, memorandum, transcript, report, handwritten notes, test data) and provide the following information as applicable: Document name, title, number, author, date of publication and publisher, addressee, date written or approved, and the name and address of the person or persons having possession of the document. Also state the portion or portions of the document (whether section(s), chapter(s), or page(s)) upon which Joint Intervenors rely.

Definitions. As used hereinafter, the following definitions shall apply:

The "ER" is the Environmental Report - Operating License Stage for the Shearon Harris Nuclear Power Plant, as amended.

The "FSAR" is the Final Safety Analysis Report for the Shearon Harris Nuclear Power Plant, as amended.

"Applicants" is intended to encompass Carolina Power & Light Co., North Carolina Eastern Municipal Power Agency and their contractors for the Harris Plant.

"Document(s)" means all writings and records of every type in the possession, control or custody of CCNC or any individual acting on its behalf, including, but not limited to, memoranda, correspondence, reports, surveys, tabulations, charts, books, pamphlets, photographs, maps, bulletins, minutes, notes, speeches, articles, transcripts, voice recordings and all other writings or recordings of any kind; "document(s)" shall also mean copies of documents even though the originals thereof are not in the possession, custody, or control of CCNC a document shall be deemed to be within the "control" of CCNC or any individual acting on its behalf if CCNC or such individual has ownership, possession or custody of the document or copy thereof, or has the right to secure the document or copy thereof, from any person or public or private entity having physical possession thereof.

#### GENERAL INTERROGATORIES

1(a). State the name, present or last known address, and present or last known employer of each person known to CCNC to have first-hand knowledge of the facts alleged, and upon which

CCNC relied in formulating allegations, in each of the contentions which are the subject of this set of interrogatories.

(b). Identify those facts concerning which each such person has first-hand knowledge.

(c). State the specific allegation in each contention which Joint Intervenors contend such facts support.

2(a). State the name, present or last known address, and present or last employer of each person, other than affiant, who provided information upon which CCNC relied in answering each interrogatory herein.

(b). Identify all such information which was provided by each such person and the specific interrogatory response in which such information is contained.

3(a). State the name, address, title, employer and educational and professional qualifications of each person CCNC intends to call as an expert witness or a witness relating to any contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) regarding which each such person is expected to testify.

(c). State the subject matter to which each such person is expected to testify.

4(a). Identify all documents in Joint Intervenors' possession, custody or control, including all relevant page citations, pertaining to the subject matter of, and upon which CCNC relied in formulating allegations in each contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) to which each such document relates.

(c). State the specific allegation in each contention which CCNC contends each document supports.

5(a). Identify all documents in CCNC's possession, custody or control, including all relevant page citations, upon which you relied in answering each interrogatory herein.

(b). Identify the specific interrogatory response(s) to which each such document relates.

6(a). Identify any other source of information, not previously identified in response to Interrogatory 2 or 5, which was used in answering the interrogatories set forth herein.

(b). Identify the specific interrogatory response(s) to which each such source of information relates.

7(a). Identify all documents which CCNC intends to offer as exhibits during this proceeding to support the contentions which are the subject of this set of interrogatories or which CCNC intends to use during cross-examination of witnesses

presented by Applicants and/or the NRC Staff on each contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) to which each document relates and the particular page citations applicable to each contention.

INTERROGATORIES ON CONTENTION 12 (JORDAN DAM BREAK)

12-1 (a). Do you contend that Applicants failed to analyze dam failures or possible failure of the Shearon Harris Nuclear Plant Main Reservoir Dam (hereinafter "Main Dam")?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that Applicants failed to analyze dam failures or possible failure of the Main Dam.

(c). If the answer to (a) above is negative, do you contend Applicants' analysis is inadequate? If so, explain in detail the basis for your contention.

12-2. State in detail all the facts which support your allegation that a break in Jordan Lake Dam would result in a flood greater than the probable maximum flood used by Applicants to determine the effects of high water upon the site.

12-3. State in detail all the facts which support your allegation that a break in Jordan Lake Dam would result in the existing Buckhorn Dam being carried away.

12-4 (a). Do you contend that there are deficiencies associated with construction of the Main Dam?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that there are deficiencies associated with construction of the Main Dam.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegation set forth in Contention 12.

12-5 (a). Do you contend that the Auxiliary Reservoir is insufficient to provide adequate cooling capacity to safely shut down both reactors?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that the Auxiliary Reservoir is insufficient to provide adequate cooling capacity to safely shut down both reactors.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegation set forth in Contention 12.

12-6 (a). Do you contend that the differences in elevation between the Cape Fear River bank and the Main Dam crest is insufficient to preclude any effects on the Main Dam or Harris Reservoir of a flood resulting from a break in Jordan Lake Dam?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that the differences in elevation between the Cape Fear River bank and the Main Dam crest is insufficient to preclude any effects on the Main Dam or Harris Reservoir of a flood resulting from a break in Jordan Lake Dam.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegation set forth in Contention 12.

INTERROGATORIES ON CONTENTION 14 (HYDRILLA VERTICILLATA)

14-1 (a). Do you contend that hydrilla verticillata (hereinafter hydrilla) will be introduced into the Shearon Harris Nuclear Plant reservoir?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that hydrilla will be introduced into the Shearon Harris Nuclear Plant reservoir.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 14.

14-2 (a). Do you contend that mesh traveling screens through which cooling tower makeup water must pass are inadequate to prevent hydrilla from clogging intake valves?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your

allegation that mesh traveling screens through which cooling tower makeup water must pass are inadequate to prevent hydrilla from clogging intake valves.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 14.

14-3 (a). Do you contend that makeup water intake valves clogged by hydrilla provide insufficient amounts of water to cool down both reactors?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that makeup water intake valves clogged by hydrilla provide insufficient amounts of water to cool down both reactors.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 14.

14-4 (a). Do you contend that hydrilla will clog other parts of the Harris Plant cooling system?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that hydrilla will clog other parts of the Harris Plant cooling system. Your answer should include, but not be limited to, a detailed listing of those portions of the cooling system you allege will be clogged by hydrilla.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 14.

14-5 (a). Do you contend that Applicants have failed to consider the possibility that hydrilla, among other obstructions, could clog the intake structure and have failed to design against such an occurrence?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that Applicants have failed to consider the possibility that hydrilla, among other obstructions, could clog the intake structure and have failed to design against such occurrence.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 14.

14-6 (a). Do you contend that hydrilla could become established in water at the depth of 30 feet or greater?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that hydrilla could become established in water at the depth of 30 feet.

14-7 (a). Do you contend that hydrilla could become established in water continually traveling at a velocity of 0.4 feet per second or greater?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that hydrilla could become established in water continually traveling at a velocity of 0.4 feet per second.

14-8 (a). Do you contend that hydrilla will be carried by currents from other parts of Harris Reservoir to the vicinity of the water intake structure?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that hydrilla will be carried by currents from other parts of Harris Reservoir to the vicinity of the water intake structure.

(c). If the answer to (a) above is other than affirmative, state in detail how you contend hydrilla will be carried to the vicinity of the water intake structure.

#### REQUEST FOR PRODUCTION OF DOCUMENTS

Applicants request that CCNC respond in writing to this request for production of documents and produce the original or best copy of each of the documents identified or described

in the answers to each of the above interrogatories, at a place mutually convenient to the parties.

Respectfully submitted,

*Thomas A. Baxter*

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DATED: January 31, 1983

DOCKETED  
USNRC

January 31, 1983

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

APPLICANTS' INTERROGATORIES  
AND REQUEST FOR PRODUCTION OF DOCUMENTS  
TO INTERVENOR RICHARD D. WILSON (FIRST SET)

Pursuant to 10 C.F.R. §§ 2.740b and 2.741 and to the Atomic Safety and Licensing Board's "Memorandum and Order (Reflecting Decisions Made Following Prehearing Conference)" of September 22, 1982, Carolina Power & Light Company and North Carolina Eastern Municipal Power Agency hereby request that Intervenor Richard D. Wilson answer separately and fully in writing, and under oath or affirmation, each of the following interrogatories, and produce and permit inspection and copying of the original or best copy of all documents identified in the response to interrogatories below.

Under the Commission's Rules of Practice, answers or objections to these interrogatories must be served within 14

days after service of the interrogatories; responses or objections to the request for production of documents must be served within 30 days after service of the request.

These interrogatories are intended to be continuing in nature, and the answers should promptly be supplemented or amended as appropriate, pursuant to 10 C.F.R. § 2.740(e), should you or any individual acting on your behalf obtain any new or differing information responsive to these interrogatories. The request for production of documents is also continuing in nature and you must produce immediately any additional documents you or any individual acting on your behalf, obtain which are responsive to the request, in accordance with the provisions of 10 C.F.R. § 2.740(e).

Where identification of a document is requested, briefly describe the document (e.g., book, letter, memorandum, transcript, report, handwritten notes, test data) and provide the following information as applicable: Document name, title, number, author, date of publication and publisher, addressee, date written or approved, and the name and address of the person or persons having possession of the document. Also state the portion or portions of the document (whether section(s), chapter(s), or page(s)) upon which you rely.

Definitions. As used hereinafter, the following definitions shall apply:

The "ER" is the Environmental Report - Operating License Stage for the Shearon Harris Nuclear Power Plant, as amended.

The "FSAR" is the Final Safety Analysis Report for the Shearon Harris Nuclear Power Plant, as amended.

"Applicants" is intended to encompass Carolina Power & Light Co., North Carolina Eastern Municipal Power Agency and their contractors for the Harris Plant.

"Document(s)" means all writings and records of every type in the possession, control or custody of Richard D. Wilson or any individual acting on his behalf, including, but not limited to, memoranda, correspondence, reports, surveys, tabulations, charts, books, pamphlets, photographs, maps, bulletins, minutes, notes, speeches, articles, transcripts, voice recordings and all other writings or recordings of any kind; "document(s)" shall also mean copies of documents even though the originals thereof are not in the possession, custody, or control of Richard D. Wilson; a document shall be deemed to be within the "control" of Richard D. Wilson or any individual acting on his behalf if he has ownership, possession or custody of the document or copy thereof, or has the right to secure the document or copy thereof, from any person or public or private entity having physical possession thereof.

#### General Interrogatories

1(a). State the name, present or last known address, and present or last known employer of each person known to you to have first-hand knowledge of the facts alleged, and upon which you relied in formulating allegations, in each of the

contentions which are the subject of this set of interrogatories.

(b). Identify those facts concerning which each such person has first-hand knowledge.

(c). State the specific allegation in each contention which you contend such facts support.

2(a). State the name, present or last known address, and present or last employer of each person, other than affiant, who provided information upon which you relied in answering each interrogatory herein.

(b). Identify all such information which was provided by each such person and the specific interrogatory response in which such information is contained.

3(a). State the name, address, title, employer and educational and professional qualifications of each person you intend to call as an expert witness or a witness relating to any contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) regarding which each such person is expected to testify.

(c). State the subject matter to which each such person is expected to testify.

4(a). Identify all documents in your possession, custody or control, including all relevant page citations, pertaining

to the subject matter of, and upon which you relied in formulating allegations in each contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) to which each such document relates.

(c). State the specific allegation in each contention which you contend each document supports.

5(a). Identify all documents in your possession, custody or control, including all relevant page citations, upon which you relied in answering each interrogatory herein.

(b). Identify the specific interrogatory response(s) to which each such document relates.

6(a). Identify any other source of information, not previously identified in response to Interrogatory 2 or 5, which was used in answering the interrogatories set forth herein.

(b). Identify the specific interrogatory response(s) to which each such source of information relates.

7(a). Identify all documents which you intend to offer as exhibits during this proceeding to support the contentions which are the subject of this set of interrogatories or which you intend to use during cross-examination of witnesses presented by Applicants and/or the NRC Staff on each contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) to which each document relates and the particular page citations applicable to each contention.

Interrogatories on Contention I(a)

I(a)-1(a). Do you contend that the use of a chlorination system as described in Section 3.4.2.4 of the ER which would require 3-5 ppm chlorine and which would operate for two 30-minute cycles per day would result in chlorine dispersal into the atmosphere with a resulting adverse impact upon the biosphere surrounding the Harris plant?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that use of a chlorination system as described in Section 3.4.2.4 of the ER which would require 3-5 ppm chlorine and which would operate for two 30-minute cycles per day would result in chlorine dispersal into the atmosphere with a resulting adverse impact upon the biosphere surrounding the Harris plant.

(c). If not contained in your answer to (b) above, please identify specifically the nature and extent of chlorine dispersal which allegedly would occur; the compounds; the threshold concentration at which these compounds can adversely affect the environment; the nature of the adverse impact that you allege would occur; and the components of the biosphere which you allege would be affected. Describe in detail the

basis for your answer, including an identification of any assumptions employed.

(d). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(a).

I(a)-2(a). Do you contend that the use of such a chlorination system at a frequency greater than two 30-minute cycles per day would result in chlorine dispersal into the atmosphere with a resulting adverse impact upon the biosphere surrounding the Harris plant?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all of the facts which support your allegation that use of such a chlorination system at a frequency greater than two 30-minute cycles per day would result in chlorine dispersal into the atmosphere surrounding the Harris plant.

(c). If not contained in your answer to (b) above, please state the frequency of chlorine usage which you allege would result in an adverse impact upon surrounding biosphere; the nature and extent of chlorine dispersal which allegedly would occur; the nature of the adverse impact which allegedly would occur; and the components of the biosphere which allegedly would be adversely affected.

(d). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I (a).

I(a)-3(a). Do you contend that the NPDES Permit for the Harris Plant issued on July 12, 1982 (attached hereto) does not adequately limit the amount of free available chlorine and total residual chlorine which may be discharged in the blowdown from the cooling system?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all of the facts which support your allegation that the NPDES Permit for the Harris Plant issued on July 12, 1982 does not adequately limit the amount of free available chlorine and total residual chlorine which may be discharged in the blowdown from the cooling system.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(a).

I(a)-4(a). Do you contend that the composition of the cooling tower drift would be different from that of the cooling tower blowdown?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all of the facts which support your allegation that the composition of the cooling tower drift would be different from that of the cooling tower blowdown.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(a).

I(a)-5. Identify, by title and citation, the "critical reference" regarding chlorine dispersal referred to in your contention.

Interrogatories on Contention I(b)

I(b)-1(a). Do you contend that chlororganic compounds will be dispersed in the Harris plant cooling tower evaporation and will be toxic to the biosphere surrounding the Harris plant?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that chlororganic compounds will be dispersed in cooling tower evaporation and will be toxic to the biosphere surrounding the Harris plant.

(c). If not contained in your answer to (b) above, please identify the types and amounts of chlororganic compounds which allegedly would reside in the Harris Plant cooling towers; the compounds formed and the concentrations of chlororganics and other materials required to form these compounds; the threshold concentration at which these compounds can adversely affect the environment; the nature and extent of dispersal which allegedly would occur; the adverse components of the biosphere surrounding the Harris plant which allegedly would be affected. State in detail the basis for your answer, and identify any assumptions employed.

(d). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(b).

Interrogatories on Contention I(c)

I(c)-1(a). Do you contend that sulphuric acid and hydrogen peroxide which may be added as a cooling tower treatment to correct PH would be toxic to the biosphere surrounding the Harris Plant?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that sulphuric acid and hydrogen peroxide which may be added as cooling tower treatment to correct PH would be toxic to the biosphere surrounding the Harris Plant.

(c). If not contained in your answer to (b) above, please identify the nature and amounts of dispersals which allegedly would occur; the components of the surrounding biosphere which allegedly would suffer adverse affects; and the nature of those adverse affects.

(d). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(c).

Interrogatories on Contention I(d)

I(d)-1(a). Do you contend that biocides other than chlorine which might be added to the Harris Plant cooling tower water will be toxic to the biosphere?

(b). If the answer to the preceding interrogatory is affirmative, please state in detail all the facts which support your allegation that biocides other than chlorine which might be added to the Harris Plant cooling tower water will be toxic to the biosphere in the concentrations normally associated with treating cooling tower water systems.

(c). If not contained in your answer to (b) above, please identify the nature and quantities of the biocides which you allege would be toxic to the biosphere if added to the cooling tower water; the compounds formed and the concentration of other biocides along with other materials required to form these compounds; the threshold concentration at which these compounds can adversely affect the environment; the components of the biosphere which would suffer adverse effects and the nature of those adverse effects. State in detail the basis for your answer, and identify any assumptions employed.

(d). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(d).

Interrogatories on Contention I(e)

I(e)-1. State in detail all the facts which support your allegation that large amounts of water will frequently be pumped from the Cape Fear River into the Main Harris Reservoir.

I(e)-2(a). State in detail all the facts which support your allegation that this water as pumped from the Cape Fear

River will be heavily contaminated by upstream manufacturing and textile effluents.

(b). If not contained in your answer to (a) above, please provide a breakdown by type of all alleged contaminants, amount (percentage) of each such contaminant, and the source(s) of each such contaminant at the intake point of the Cape Fear River makeup water pump station.

I(e)-3(a). Do you contend that large volumes of contaminated water will be dispersed from the Harris Plant cooling towers?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that large volumes of contaminated water will be dispersed from the Harris Plant cooling towers. Your answer should include, but not be limited to, what is meant by your use of the word "dispersed" in such allegation.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(e).

I(e)-4(a). If the answer to I(e)-3(a) is affirmative, do you contend that dispersion of contaminated water from the Harris Plant cooling towers will be toxic to the biosphere?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that dispersion of contaminated water from the

Harris Plant cooling towers will be toxic to the biosphere. Your answer should include, but not be limited to, a breakdown of the individual elements of the biosphere which will be affected in a toxic manner and the manner in which each will be affected.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(e).

Interrogatories on Contention I(f)

I(f)-1(a). Do you contend that steady state water levels in the Harris Plant Main Reservoir cannot be maintained with inflow from Buckhorn Creek and makeup water from the Cape Fear River?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that steady state water levels in the Harris Plant Main reservoir cannot be maintained with inflow from Buckhorn Creek and makeup water from the Cape Fear River.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(f).

I(f)-2(a). Do you contend that steady state water levels in the Harris Plant Main reservoir cannot be maintained without makeup water from the Cape Fear River?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that steady state water levels in the Harris Plant Main reservoir cannot be maintained without makeup water from the Cape Fear River.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(f).

I(f)-3(a). Do you contend there is a requirement for a steady state water level in the Main Reservoir?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that there is a requirement for a steady state water level in the Main Reservoir.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(f).

I(f)-4(a). Do you contend that the Main Reservoir will function as the ultimate heat sink in the event of a loss of service from the cooling towers?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that the Main Reservoir will function as the ultimate heat sink in the event of a loss of service from the cooling towers.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(f).

I(f)-5(a). Do you contend that the Main Reservoir is necessary as a backup cooling reservoir to safely shut down and cool down both reactors?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that the Main Reservoir is necessary as a backup cooling reservoir to safely shut down and cool down both reactors.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(f).

I(f)-6(a). Do you contend that ultimate heat sink dependability requirements analysis as contained in FSAR § 2.4.11.7 is incorrect, inadequate, or flawed?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that ultimate heat sink dependability requirements analysis as contained in FSAR § 2.4.11.7 is incorrect, inadequate, or flawed?

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(f).

I(f)-7(a). Do you contend that the estimated measure of consumptive water use is incorrectly calculated?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that the estimated measure of consumptive water use is incorrectly calculated.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention I(f).

I(f)-8. State in detail all the facts which support your allegation that estimates of Buckhorn Creek flow as contained in FSAR § 2.3.1.2.1.1 are inadequate and rest on false assumptions.

I(f)-9(a). Do you contend that the rainfall of Buckhorn Creek watershed is not equivalent to the rainfall in Middle Creek watershed?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that the rainfall in Buckhorn Creek watershed is not equivalent to the rainfall in Middle Creek watershed, including what you believe the rainfall in each watershed to be.

I(f)-10. If not contained in your answers to I(f)-8 or I(f)-9(a) or (b), please list each false assumption underlying

Applicants' estimates of Buckhorn Creek flow as contained in the FSAR, and state in detail the facts which support your allegation that each of those assumptions is false.

I(f)-11(a). Do you contend that the difference in flow between Buckhorn Creek of 79 cfs and the projected average consumptive water use of the Harris plant to be inadequate to maintain a steady state water level in the plant main reservoir?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that the difference in flow between Buckhorn Creek of 79 cfs and the projected average consumptive water use of the Harris plant to be inadequate to maintain a steady water level in the plant main reservoir.

I(f)-12. State all the facts upon which you rely in support of your allegation that the Cape Fear River must be considered a frequent source of water for the Harris Main Reservoir.

#### REQUEST FOR PRODUCTION OF DOCUMENTS

Applicants request that Richard D. Wilson respond in writing to this request for production of documents and produce the original or best copy of each of the documents identified

or described in the answers to each of the above interrogatories at a place mutually convenient to the parties.

Respectfully submitted,

*Thomas A. Baxter*

George F. Trowbridge, P.C.  
Thomas A. Baxter, P.C.  
John H. O'Neill, Jr.  
SHAW, PITTMAN, POTTS & TROWBRIDGE  
1800 M Street, N.W.  
Washington, D.C. 20036  
(202) 822-1000

Richard E. Jones  
Samantha Francis Flynn  
CAROLINA POWER & LIGHT COMPANY  
Post Office Box 1551  
Raleigh, North Carolina 26602  
(919) 836-7707

DATED: January 31, 1983

STATE OF NORTH CAROLINA  
DEPARTMENT OF NATURAL RESOURCES & COMMUNITY DEVELOPMENT  
DIVISION OF ENVIRONMENTAL MANAGEMENT

P E R M I T

To Discharge Wastewater Under the NATIONAL  
POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of North Carolina General Statute 143-215.1, other lawful standards and regulations promulgated and adopted by the North Carolina Environmental Management Commission, and the Federal Water Pollution Control Act, as amended,

Carolina Power and Light Company

is hereby authorized to discharge wastewater from a facility located at

Shearon Harris Nuclear Power Plant  
Wake County

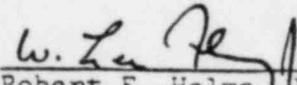
to receiving waters of Harris Reservoir on Buckhorn Creek

in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, and III hereof.

This permit shall become effective July 12, 1982.

This permit and the authorization to discharge shall expire at midnight on June 30, 1987.

Signed this day of July 12, 1982.

  
\_\_\_\_\_  
Robert F. Helms, Director  
Division of Environmental Management  
By Authority of the Environmental  
Management Commission

SUPPLEMENT TO PERMIT COVER SHEET

Carolina Power and Light Company

is hereby authorized to: (include only appropriate items)

1. Enter into a contract for construction of wastewater treatment facilities
2. Make an outlet into Harris Reservoir on Buckhorn Creek
3. Construct and operate a facilities to control pollutants from cooling tower blowdown, sanitary sewage treatment plant, metal cleaning and low volume wastes in accordance with applicable effluent limits located at Shearon Harris Nuclear Power Plant subject to Part III, condition No. C.            of this Permit, and
4. Discharge from said treatment works into the Harris Reservoir Buckhorn C which is classified Class "C".

A. ( ). EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning at first discharge and lasting until expiration  
 permittee is authorized to discharge from outfall(s) serial number(s). 001-Cooling tower blowdown to Harri  
 Such discharges shall be limited and monitored by the permittee as specified below: Reservoir

Effluent Characteristics	Discharge Limitations		Monitoring Requirements				
	Kg/day (lbs/day)		Other Units (Specify)		Measurement	Sample	Sample
	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.	Frequency	Type	Location
Flow			1/	30 mgd	Continuous or Pump Log	Recorder	E
Temperature			1/		1/	1/	1/
Zinc**			1.0 mg/l	1.0 mg/l	1/Week	Grab	E*
Total Chromium**			0.2 mg/l	0.2 mg/l	1/Week	Grab	E*
Phosphours**			5 mg/l	5 mg/l	1/Week	Grab	E*
			<u>Average</u>	<u>Instantaneous</u>			
				<u>Maximum</u>			
Free available Chlorine 2/			0.2 mg/l	0.5 mg/l	1/Week	Multiple Grab At each tower	
Total Residual Chlorine 2/					1/Week	Multiple Grab At each tower	

1/ Discharge of blowdown from the cooling system shall be limited to the minimum discharge of recirculating water necessary for the purpose of discharging materials contained in the process, the further build-up of which would cause concentrations or amounts exceeding limits of established engineering practice. The discharge shall not result in the violation of Class "C" water quality standards outside of a mixing zone of 200 acres around the point of discharge. This mixing zone is for temperature and chlorine. The temperature within the mixing zone shall not : (1) prevent free passage of fish around or cause fish mortality within the mixing zone; (2) result in offensive conditions; (3) produce undesirable aquatic life or result in a dominance of nuisance species outside of the zone (4) endanger the public health or welfare. Monitoring adequate to demonstrate compliance with the blowdown minimization, water quality standards for temperature outside of the mixing zone, and prohibitions within the mixing zone shall be proposed by the permittee six months prior to start-up and, upon approval of the proposal, the results submitted with the monthly monitoring report. The permittee may discharge cooling water to the auxillary reservoir in compliance with Part III-E of this Permit.

2/ Neither free available chlorine nor total residual may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant discharge free available or total residual chlorine at any one time unless the permittee can demonstrate to the Director Division of Environmental Management that the unit in question cannot operate at or below this level of chlorination. The permittee shall record and report the times of release as a part of the monthly monitoring report.

3/ No later than three years after promulgation or July 1, 1987, whichever is earlier, Total Residual Chlorine shall not exceed a maximum concentration of 0.14 mg/l in the combined cooling tower blowdown discharge. Note: In the event of

(Continued on next page)

NC Permit No.

A. ( ) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3/ (continued) BAT regulations for control are promulgated in a manner inconsistent with the October 14, 1980, proposed guidelines, requirements of this paragraph shall be modified consistent with the promulgated regulations (40 CFR 423). There shall be no discharge of detectable amounts of materials added for corrosion inhibition or any chemical added which contain the 129 priority pollutants.

\* Effluent prior to mixing with any other waste stream.

\*\* Effective after July, 1983. These limitations and monitoring requirements apply only if these materials are added by the permittee.

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored weekly on a grab sample of the effluent.

There shall be no discharge of floating solids or visible foam in other than trace amounts.



A. ( ). EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning upon initiation of discharge and lasting until expiration permittee is authorized to discharge from outfall(s) serial number(s). 003 metal cleaning wastes Such discharges shall be limited and monitored by the permittee as specified below: discharged to Harris Reservoir on Buckhorn Cr.

Effluent Characteristics	Discharge Limitations		Monitoring Requirements		Sample Loca <sup>+</sup>		
	Kg/day (lbs/day)		Other Units (Specify)			Measurement Frequency	Sample Type
	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.			
Flow			0.8		During discharge	1/	E*
TSS	(Quantities of pollutants discharged shall not exceed the quantity obtained by multiplying the flow of metal cleaning wastes generated times the concentrations listed to the right.)		30 mg/l	100 mg/l	Daily during discharge	Grab	E*
Oil & Grease			15 mg/l	20 mg/l	Daily during discharge	Grab	E*
Copper, Total			1.0 mg/l	1.0 mg/l	Daily during discharge	Grab	E*
Iron, Total			1.0 mg/l	1.0 mg/l	Daily during discharge	Grab	E*

\*Effluent prior to mixing with any other waste stream

1/ Commensurate with treatment system installed

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored daily during discharge on a grab sample of the effluent. \*

A. ( ). EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning upon initiation of discharge and lasting until expiration permittee is authorized to discharge from outfall(s) serial number(s). 004 low volume wastes discharged Such discharges shall be limited and monitored by the permittee as specified below: to Harris Reservoir on Buckhorn Creek

Effluent Characteristics	Discharge Limitations				Monitoring Requirements		
	Kg/day (lbs/day)		Other Units (Specify)		Measurement Frequency	Sample Type	Sample Locat <sup>1</sup>
	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.			
Flow			1.5 MGD		1/	1/	1/
TSS	170(375)	568(1251)			Weekly	Grab	Effluent
Oil & Grease	85(187)	113(250)			Weekly	Grab	E*

1/ Commensurate with treatment system installed

\*Effluent prior to mixing with any other waste stream

Low volume wastes shall mean but not all inclusive, taken collectively as if from one source, wastewater from wet scrubber air pollution control system, ion exchange, water treater systems, water treatment evaporator blowdown, laboratory and sampling streams, floor drainage, cooling tower basin cleaning wastes, blowdown from recirculating house service water systems, and steam generator blowdown.

Prior to Start-up of Unit #2, quantity limitations shall be one-half of the limitations shown.

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored weekly on a grab sample of the effluent.

Permit No.  
NC 0039586

A. ( ). EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning upon initiation of discharge and lasting until expiration permittee is authorized to discharge from outfall(s) serial number(s). 005 Point Source run-off Such discharges shall be limited and monitored by the permittee as specified below: from construction

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>		<u>Monitoring Requirements</u>				
	<u>Kg/day (lbs/day)</u>		<u>Other Units (Specify)</u>		<u>Measurement</u>	<u>Sample</u>	<u>Samp</u>
	<u>Daily Avg.</u>	<u>Daily Max.</u>	<u>Daily Avg.</u>	<u>Daily Max.</u>	<u>Frequency</u>	<u>Type</u>	<u>Loc?</u>

Point source run-off from construction is permitted in compliance with a sedimentation and erosion control plan approved by the Land Quality Section of the Division of Land Resources.

Permit No.  
 NC 0607786

B. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

Not Applicable.

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

Permit No. NC

Act used herein means the Federal Water Pollution Control Act, As amended.  
DEM used herein means the Division of Environmental Management of the  
Department of Natural Resources and Community Development  
"EMC" used herein means the North Carolina Environmental Management  
Commission.

### C. MONITORING AND REPORTING

#### 1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

#### 2. Reporting

Monitoring results obtained during the previous month(s) shall be summarized for each month and reported on a Monthly Monitoring Report Form (DEM No. MR 1.0, 1.1, and 1.4) postmarked no later than the 45th day following the completed reporting period. The first report is due on . The DEM may require reporting of additional monitoring results by written notification. Signed copies of these, and all other reports required herein, shall be submitted to the following address:

Division of Environmental Management  
Water Quality Section  
Post Office Box 27687  
Raleigh, North Carolina 27611

#### 3. Definitions

- a. The "daily average" discharge means the total discharge by weight during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the summation of all the measured daily discharges by weight divided by the number of days sampled during the calendar month when the measurements were made.
- b. The "daily maximum" discharge means the total discharge by weight during any calendar day.

#### 4. Test Procedures

Test procedures for the analysis of pollutants shall conform to The EMC regulations published pursuant to N. C. G. S. 143-215.63 et seq.. The Water and Air Quality Reporting Act, Section 304(g), 13 USC 1314, of the Federal Water Pollution Control Act, As Amended, and Regulation 40 CFR 136.

#### 5. Recording Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

- a. The exact place, date, and time of sampling;
- b. The dates the analyses were performed;
- c. The person(s) who performed the analyses;
- d. The analytical techniques or methods used; and
- e. The results of all required analyses.

6. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Monthly Monitoring Report Form (DEM MR 1.0, 1.1, 1.4) Such increased monitoring frequency shall also be indicated. The DEM may require more frequent monitoring or the monitoring of other pollutants not required in this permit by written notification.

7. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained by the permittee for a minimum of three (3) years, or longer if requested by the State Division of Environmental Management or the Regional Administrator of the Environmental Protection Agency.

## A. MANAGEMENT REQUIREMENTS

## 1. Change in Discharge

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, production increases, or process modifications which will result in new, different, or increased discharges of pollutants must be reported by submission of a new NPDES application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the DEM of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

## 2. Non compliance Notification

If, for any reason, the permittee does not comply with or will be unable to comply with any effluent limitation specified in this permit, the permittee shall provide the Division of Environmental Management with the following information, in writing, within five (5) days of becoming aware of such condition:

- a. A description of the discharge and cause of noncompliance; and
- b. The period of noncompliance, including exact dates and times; or, if not corrected; the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

## 3. Facilities Operation

The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

## 4. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to navigable waters resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

## 5. Bypassing

Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited, except (i) where

unavoidable to prevent loss of life or severe property damage, or (ii) where excessive storm drainage or runoff would damage any facilities necessary for compliance with the effluent limitations and prohibitions of this permit. The permittee shall promptly notify the Water Quality Section of DEM in writing of each such diversion or bypass.

6. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering waters of the State or navigable waters of the United States.

7. Power Failures

In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

- a. In accordance with the Schedule of Compliance contained in Part I, provide an alternative power source sufficient to operate the wastewater control facilities;

or, if such alternative power source is not in existence, and no date for its implementation appears in Part I,

- b. Halt, reduce or otherwise control production and/or all discharges from wastewater control facilities upon the reduction, loss, or failure of the primary source of power to said wastewater control facilities.

8. Onshore or Offshore Construction

This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any navigable waters.

## B. RESPONSIBILITIES

## 1. Right of Entry

The permittee shall allow the Director of the Division of Environmental Management, the Regional Administrator, and/or their authorized representatives, upon the presentations of credentials:

- a. The enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and
- b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any discharge of pollutants.

## 2. Transfer of Ownership or Control

This permit is not transferable. In the event of any change in control or ownership of facilities from which the authorized discharge emanates or is contemplated, the permittee shall notify the prospective owner or controller by letter of the existence of this permit and of the need to obtain a permit in the name of the prospective owner. A copy of the letter shall be forwarded to the Division of Environmental Management.

## 3. Availability of Reports

Except for data determined to be confidential under N. C. G. S. 143-215.3(a)(2) or Section 308 of the Federal Act, 33 USC 1318, all reports prepared in accordance with the terms shall be available for public inspection at the offices of the Division of Environmental Management. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in N. C. G. S. 143-215.6(b)(2) or in Section 309 of the Federal Act.

## 4. Permit Modification

After notice and opportunity for a hearing pursuant to N. C. G. S. 143-215.1(b)(2) and G. S. 143-215.1(e) respectively, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

- a. Violation of any terms or conditions of this permit;
- b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or
- c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

## 5. Toxic Pollutants

Notwithstanding Part II, B-4 above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition and the permittee so notified.

## 6. Civil and Criminal Liability

Except as provided in permit conditions on "Bypassing" (Part II, A-5) and "Power Failures" (Part II, A-7), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance pursuant to N. C. G. S. 143-215.6 or Section 309 of the Federal Act, 33 USC 1319.

## 7. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under N. C. G. S. 143-215.75 et seq. or Section 311 of the Federal Act, 33 USC 1321.

## 8. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

## 9. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

10. Expiration of Permit

Permittee is not authorized to discharge after the expiration date. In order to receive authorization to discharge beyond the expiration date, the permittee shall submit such information, forms, and fees as are required by the agency authorized to issue permits no later than 180 days prior to the expiration date. Except as provided in N.C.G.S. 150A, any discharge without a permit after the expiration will subject the permittee to enforcement procedures as provided in N.C.G.S. 143-215.6 and 33 USC 1251 et seq..

B. Previous Permits

All previous State water quality permits issued to this facility, whether for construction or operation or discharge, are hereby revoked by issuance of this permit. The conditions, requirements, terms, and provisions of this permit authorizing discharge under the National Pollutant Discharge Elimination System governs discharges from this facility.

C. Construction

No construction of wastewater treatment facilities or additions thereto shall be begun until Final Plans and Specifications have been submitted to the Division of Environmental Management and written approval and Authorization to Construct has been issued. If no objections to Final Plans and Specifications has been made by the DEM after 30 days following receipt of the plans or issuance of this permit, whichever is latter, the plans may be considered approved and construction authorized.

D. Certified Operator

Pursuant to Chapter 90A of North Carolina General Statutes, the permittee shall employ a certified wastewater treatment plant operator in responsible charge of the wastewater treatment facilities. Such operator must hold a certification of the grade equivalent to the classification assigned to the wastewater treatment facilities.

E. Heated Water Discharge to Auxillary Reservoir

In order to insure that the auxillary reservoir is available for its' designed use at all times, the permittee may circulate heated water through the auxillary reservoir to prevent ice formation at any time that the surface water temperature is below 35°F provided that the surface water temperature in the auxillary reservoir is not raised more 5°F above ambient temperature and in no case is raised to more than 40°F.

F. There shall be no discharge of polychlorinated biphenyls (PCB's) from this facility to the extent that this compound is not present in the facility's intake waters.

G. Withdrawal from the Cape Fear River

Withdrawals from the Cape Fear River, shall be limited to 25% of the flow in the river except that no withdrawals shall be made from the river when the flow is 600 cfs or less nor which will reduce the flow in the river to less than 600 cfs as measured at the USGS Lillington Gauge. The withdrawals shall be monitored and reported monthly on the monthly monitoring report.

H. Nothing contained in this Permit shall be construed as a waiver by the Permittee of any right to a hearing it may have pursuant to State or Federal law or regulations.

I. Water discharged as backwash from intake screens is permitted without limitations or monitoring requirements.

J. The Permittee shall submit information relative to the design, location, construction and capacity of the cooling water intake structures to demonstrate application of best technology available for minimizing adverse environmental impact in accordance with the adopt guidelines for cooling water intake structures. This information must be submitted on or before December 31, 1982.

K. If any applicable standard or limitation is promulgated under sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) and that effluent standard is more stringent than any effluent limitation in this permit or controls a pollutant not limited in this permit, this permit shall be promptly modified, or revoked and reissued, to conform to that effluent standard or limitation.

L. Within one year after start-up of the first unit, the permittee shall analyze the discharges serial no.s 001, 003, and 004 for the priority pollutants as required by 40 CFR 122.53(d)(7) to the extent that data is still required by regulation in effect at that times.

M. Should the guidelines and/or water quality standards upon which the limitations of this permit are based be revised to be less stringent, the permittee may request relaxation of the permit limits in keeping with the revised guidelines and/or standards.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

DOCKETED  
USNRC

'83 FEB -3 P2:52

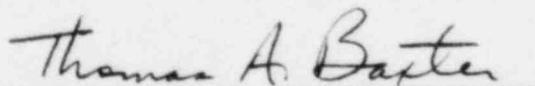
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

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) )

CERTIFICATE OF SERVICE

I hereby certify that copies of "Applicants' Interrogatories and Request for Production of Documents to Joint Intervenors (First Set)," "Applicants' Interrogatories and Request for Production of Documents to Conservation Council of North Carolina (First Set)," "Applicants' Interrogatories and Request for Production of Documents to Intervenor CHANGE (First Set)," "Applicants' Interrogatories and Request for Production of Documents to Intervenor Richard D. Wilson (First Set)" and "Applicants' Interrogatories and Request for Production of Documents to Intervenor Wells Eddleman (First Set)" were served this 31st day of January, 1983, by deposit in the U.S. mail, first class, postage prepaid, to the parties identified on the attached Service List.

  
Thomas A. Baxter, P.C.

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) )

SERVICE LIST

James L. Kelley, Esquire  
Atomic Safety and Licensing Board  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Mr. Glenn O. Brigitt  
Atomic Safety and Licensing Board  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dr. James H. Carpenter  
Atomic Safety and Licensing Board  
U.S. Nuclear Regulatory Commission  
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Charles A. Barth, Esquire  
Myron Karman, Esquire  
Office of Executive Legal Director  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Docketing and Service Section  
Office of the Secretary  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Mr. Daniel F. Read, President  
Chapel Hill Anti-Nuclear Group Effort  
P.O. Box 524  
Chapel Hill, North Carolina 27514

John D. Runkle, Esquire  
Conservation Council of North Carolina  
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