

October 24, 1986

Docket No. 50-400

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Mr. E. E. Utley, Senior Executive
 Vice President
 Power Supply and Engineering
 and Construction
 Carolina Power & Light Company
 Post Office Box 1551
 Raleigh, North Carolina 27602

Dear Mr. Utley:

see Tech spec

Subject: Issuance of Facility Operating License No. NPF-53
 Shearon Harris Nuclear Power Plant, Unit 1

The NRC has issued the enclosed Facility Operating License No. NPF-53 together with Technical Specifications and Environmental Protection Plan for the Shearon Harris Nuclear Power Plant, Unit 1. The license authorizes low power testing and operation at up to but not to exceed 5 percent of reactor core power. Although the license contains various conditions discussing requirements which must be satisfied before exceeding 5 percent power, no operation in excess of 5 percent power is authorized by the license as issued. Authorization to operate beyond 5 percent power is still under consideration by the NRC. The issuance of this license authorizing operation at 5 percent of full power is without prejudice to future consideration by the Commission with respect to operation at power levels in excess of 5 percent.

Also enclosed is a copy of a related notice, the original of which has been forwarded to the Office of the Federal Register for publication.

Three signed copies of Amendment No. 1 to Indemnity Agreement No. B-103 which covers the activities authorized under License No. NPF-53 are enclosed. Please sign all copies and return one copy to this office.

Sincerely,

ORIGINAL SIGNED BY:
 GEORGE LEAR/for

Thomas M. Novak, Acting Director
 Division of PWR Licensing-A
 Office of Nuclear Reactor Regulation

Enclosures:

1. Facility Operating License No. NPF-53
2. Federal Register Notice
3. Amendment No. 1 to Indemnity Agreement No. B-103

cc w/enclosures:
 See next page

WJ
 AD/PWR-A
 ERossi
 10/19/86

*PREVIOUS CONCURRENCE SEE DATE

LA:PAD#2* DMiller 10/7/86	PE:PAD#2* JGuillen 10/7/86	PM:PAD#2* BBuckley:hc 10/7/86	FOB VBenaroya 10/9/86	EB RBallard 10/10/86	RSB CBerlinger 10/10/86	FSB JMilhoan 10/10/86
<i>FR</i> EISCB FRosa 10/9/86	OGC* CBarth 10/7/86	P&RABS WLambe 10/19/86	SP DNash 10/19/86	AD-DPLA TNovak 10/19/86	DF/RRB RVollmer 10/24/86	D/NRA HDenton 10/24/86

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Director
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Director
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U.S. Environmental Protection Agency
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of Wake County
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Raleigh, North Carolina 27312

Chairman
Board of County Commissioners
of Chatham County
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Pittsboro, North Carolina 27312

Office of Intergovernmental Relations
116 West Jones Street
Raleigh, North Carolina 27603

Chairman
North Carolina Utilities Commission
430 North Salisbury Street
Dobbs Building
Raleigh, North Carolina 27602

Mr. Bruce Blanchard, Director
Office of Environmental Project Review
U.S. Department of the Interior, Rm. 4256
18th and C Streets, N.W.
Washington, D.C. 20240

Mr. E. E. Utley
Carolina Power & Light Company

Shearon Harris

cc:

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

Docket No. 50-400

AMENDMENT TO INDEMNITY AGREEMENT NO. B-103
AMENDMENT NO. 1

Effective Oct. 24, 1986 Indemnity Agreement No. B-103, between Carolina Power and Light Company and North Carolina Eastern Municipal Power Agency and the Nuclear Regulatory Commission, dated October 28, 1985, is hereby amended as follows:

Item 2a of the Attachment to the indemnity agreement is deleted in its entirety and the following substituted therefor:

Item 2 - Amount of financial protection

- | | |
|----------------|--|
| a. \$1,000,000 | (From 12:01 a.m., October 28, 1985 to 12 midnight, October 23, 1986 inclusive) |
| \$160,000,000* | (From 12:01 a.m., October 24, 1986) |

Item 3 of the Attachment to the indemnity agreement is deleted in its entirety and the following substituted therefor:

Item 3 - Licensee number or numbers

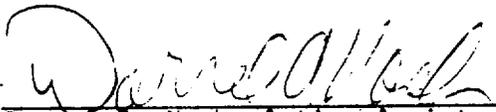
- | | |
|----------|--|
| SNM-1939 | (From 12:01 a.m., October 28, 1985 to 12 midnight, October 23, 1986 inclusive) |
| NPF-53 | (From 12:01 a.m., October 24, 1986) |

*and as of August 1, 1977, the amount available as secondary financial protection.

Item 5 of the Attachment to the indemnity agreement is amended by adding the following:

Nuclear Energy Liability Policy (Facility Form)
No. MF - 126 issued by Mutual Atomic Energy Liability
Underwriters

FOR THE U. S. NUCLEAR REGULATORY COMMISSION



Darrel A. Nash, Acting Assistant Director
State and Licensee Relations
Office of State Programs

Accepted _____, 1986

Accepted _____, 1986

By _____
CAROLINA POWER AND LIGHT COMPANY

By _____
NORTH CAROLINA EASTERN
MUNICIPAL POWER AGENCY



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

CAROLINA POWER & LIGHT COMPANY

NORTH CAROLINA EASTERN MUNICIPAL POWER AGENCY

DOCKET NO. 50-400

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

FACILITY OPERATING LICENSE

License No. NPF-53

1. The Nuclear Regulatory Commission (the Commission or the NRC) has found that:
 - A. The application for license filed by the Carolina Power & Light Company acting for itself, and North Carolina Eastern Municipal Power Agency (the licensees), complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations set forth in 10 CFR Chapter I; and all required notifications to other agencies or bodies have been duly made;
 - B. Construction of the Shearon Harris Nuclear Power Plant, Unit 1 (the facility) has been substantially completed in conformity with Construction Permit No. CPPR-158 and the application, as amended, the provisions of the Act and the regulations of the Commission;
 - C. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the regulations of the Commission (except as exempted from compliance in Section 2.D. below);
 - D. There is reasonable assurance: (i) that the activities authorized by this operating license can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I (except as exempted from compliance in Section 2.D. below);
 - E. Carolina Power & Light Company* is technically qualified to engage in the activities authorized by this license in accordance with the Commission's regulations set forth in 10 CFR Chapter I;

*Carolina Power & Light Company is authorized to act as agent for the North Carolina Eastern Municipal Power Agency, and has exclusive responsibility and control over the physical construction, operation, and maintenance of the facility.

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- F. The licensees have satisfied the applicable provisions of 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements," of the Commission's regulations;
 - G. The issuance of this license will not be inimical to the common defense and security or to the health and safety of the public;
 - H. After weighing the environmental, economic, technical, and other benefits of the facility against environmental and other costs and considering available alternatives, the issuance of this Facility Operating License No. NPF-53, subject to the conditions for protection of the environment set forth in the Environmental Protection Plan attached as Appendix B, is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied;
 - I. The receipt, possession and use of source, byproduct and special nuclear material as authorized by this license will be in accordance with the Commission's regulations in 10 CFR Parts 30, 40, and 70.
2. Based on the foregoing findings and the Partial Initial Decisions issued by the Atomic Safety and Licensing Board dated February 20, August 20, and December 11, 1985, and April 28, 1986, regarding this facility and satisfaction of conditions therein imposed, Facility Operating License No. NPF-53 is hereby issued to the Carolina Power & Light Company and the North Carolina Eastern Municipal Power Agency (the licensees) to read as follows:
- A. This license applies to the Shearon Harris Nuclear Power Plant, Unit 1, a pressurized water reactor and associated equipment (the facility) owned by the North Carolina Eastern Municipal Power Agency and owned and operated by the Carolina Power & Light Company. The facility is located on the licensees' site in Wake and Chatham Counties, North Carolina, approximately 16 miles southwest of the nearest boundary of Raleigh, the state capital, and is described in Carolina Power & Light Company's Final Safety Analysis Report, as supplemented and amended, and in its Environmental Report, as supplemented and amended;
 - B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses:
 - (1) Pursuant to Section 103 of the Act and 10 CFR Part 50, Carolina Power & Light Company to possess, use, and operate the facility at the designated location in Wake and Chatham Counties, North Carolina, in accordance with the procedures and limitations set forth in this license;
 - (2) Pursuant to the Act and 10 CFR Part 50, North Carolina Eastern Municipal Power Agency to possess the facility at the designated location in Wake and Chatham Counties, North Carolina, in accordance with the procedures and limitations set forth in the license;

- (3) Pursuant to the Act and 10 CFR Part 70, Carolina Power & Light Company to receive, possess, and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;
 - (4) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, Carolina Power & Light Company to receive, possess, and use at any time any byproduct, source and special nuclear material such as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
 - (5) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, Carolina Power & Light Company to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components;
 - (6) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, Carolina Power & Light Company to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility authorized herein;
 - (7) Pursuant to the Act and 10 CFR Parts 30 and 40, Carolina Power and Light Company to receive, possess and process for release or transfer such byproduct material as may be produced by the Shearon Harris Energy and Environmental Center.
 - (8) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, Carolina Power and Light Company to receive, possess but not separate, such byproduct and special nuclear materials as may be produced by the operation of the Brunswick Steam Electric Plant, Units 1 and 2, and H. B. Robinson Steam Electric Plant, Unit 2, provided that the authority granted herein may not be used until the indemnity agreement is amended as necessary to cover the fuel from the above reactors.
- C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

Carolina Power & Light Company is authorized to operate the facility at reactor core power levels not in excess of 2775 megawatts thermal (100 percent power) in accordance with the conditions specified herein and in Attachment 1 to this license. The preoperational tests, startup tests and other items identified in Attachment 1 to this license shall be completed as specified. Attachment 1 is hereby incorporated into this license. Pending Commission approval, this license is restricted to reactor core power levels not to exceed 5 percent of full power (139 megawatts thermal).

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Fire Protection Program (Section 9.5.1)*

Carolina Power & Light Company shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report for the facility through Amendment No. 37 and as described in the SER dated November 1983 (and Supplements 1 through 4) subject to the following provision below.

The licensees may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

*The parenthetical notation following the title of many license conditions denotes the section of the Safety Evaluation Report and/or its supplements wherein the license condition is discussed.

(4) Initial Startup Test Program (Section 14)

Any changes to the Initial Test Program described in Section 14 of the FSAR made in accordance with the provisions of 10 CFR 50.59 shall be reported in accordance with 50.59(b) within one month of such change.

(5) Steam Generator Tube Rupture (Section 15.6.3)

Prior to startup following the first refueling outage, Carolina Power & Light Company shall submit for NRC review and receive approval of a steam generator tube rupture analysis, including the assumed operator actions, which demonstrates that the consequences of the design basis steam generator tube rupture event for the Shearon Harris Nuclear Power Plant are less than the acceptance criteria specified in the Standard Review Plan, NUREG-0800, at §15.6.3 Subparts II(1) and (2) for calculated doses from radiological releases. In preparing their analysis Carolina Power & Light Company will not assume that operators will complete corrective actions within the first thirty minutes after a steam generator tube rupture.

(6) Detailed Control Room Design Review (Item I.D.1, Section 18)

Carolina Power & Light shall submit the final results of the control room surveys prior to startup following the first refueling outage.

(7) Safety Parameter Display System (Section 18.2.1)

Carolina Power & Light Company shall submit to the NRC for review prior to startup following the first refueling:

- (a) The final Validation Test Report;
- (b) The resolution of additional HED's identified on the SPDS.

(8) Antitrust Conditions

Carolina Power & Light Company shall comply with the antitrust conditions delineated in Appendix C to this license.

(9) Transamerica Delaval, Inc. (TDI) Diesel Generators

Carolina Power & Light Company shall implement the TDI diesel requirements as specified in Attachment 2. Attachment 2 is hereby incorporated into this license.

(10) Formal Federal Emergency Management Agency Finding

In the event that the NRC finds that the lack of progress in completion of the procedures in the Federal Emergency Management Agency's final rule, 44 CFR Part 350, is an indication that a major substantive problem exists in achieving or maintaining an adequate state of emergency preparedness, the provisions of 10 CFR Section 50.54(s)(2) will apply.

(11) Fresh Fuel Storage

The following criteria apply to the storage and handling of new fuel assemblies in the Fuel Handling Building:

- (a) The minimum edge-to-edge distance between a new fuel assembly outside its shipping container or storage rack and all other new fuel assemblies shall be at least 12 inches.
- (b) New fuel assemblies shall be stored in such a manner that water would drain freely from the assemblies in the event of flooding and subsequent draining of the fuel storage area.

D. Exemptions

The facility requires an exemption from Paragraph III.D.2(b)(ii) of Appendix J to 10 CFR Part 50 (see SER Section 6.2.6), which details three explicit air lock testing requirements. This exemption is authorized by law and will not endanger life or property or the common defense and security; and certain special circumstances are present. This exemption is therefore, hereby granted pursuant to 10 CFR 50.12. With the granting of this exemption, the facility will operate, to the extent authorized herein, in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission. In addition, the facility was previously granted an exemption from the criticality alarm requirements of paragraph 70.24 of 10 CFR Part 70 insofar as this section applies to this license. (See License Number SNM-1939 dated October 28, 1985, which granted this exemption).

E. Physical Security (Section 13.6.2.10)

Carolina Power & Light Company shall fully implement and maintain in effect all provisions of the physical security, guard training and qualification, and safeguards contingency plans previously approved by the Commission and all amendments and revisions to such plans made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The plans, which contain Safeguards Information protected under 10 CFR 73.21, are entitled: "Shearon Harris Nuclear Power Plant Security Plan," with revisions submitted through September 26, 1986; "Shearon

Harris Nuclear Power Plant Guard Training and Qualification Plan," with revisions submitted through October 2, 1985, and "Shearon Harris Nuclear Power Plant Safeguards Contingency Plan," with revisions submitted through October 2, 1985.

F. Reporting to the Commission

Except as otherwise provided in the Technical Specifications or Environmental Protection Plan, Carolina Power & Light Company shall report any violations of the requirements contained in Section 2.C of this license in the following manner: initial notification shall be made within twenty-four (24) hours to the NRC Operations Center via the Emergency Notification System with written follow-up with 30 days in accordance with the procedures described in 10 CFR 50.73 (b), (c) and (e).

- G. The licensees shall have and maintain financial protection of such type and in such amounts as the Commission shall require in accordance with Section 170 of the Atomic Energy Act of 1954, as amended, to cover public liability claims.
- H. This license is effective as of the date of issuance and shall expire at midnight on October 24, 2026.

FOR THE NUCLEAR REGULATORY COMMISSION



Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosures:

1. Attachment 1
2. Attachment 2 -
TDI Diesel Generators
3. Appendix A - Technical
Specifications
4. Appendix B - Environmental
Protection Plan
5. Appendix C - Antitrust Conditions

Date of Issuance: October 24, 1986

ATTACHMENT 1 TO LICENSE NPF-53
SHEARON HARRIS UNIT 1

The licensee shall complete the following preoperational tests before the date listed or before entering the Mode designated:

<u>Preoperational Test</u>	<u>Completed By</u>
1. HEPA Charcoal Filter Testing (9000-P08)	Mode 3
2. Secondary Waste Treatment (7062-P01)	Mode 1
3. Waste Process Computer (6840-PC2)	Mode 1
4. Spent Resin and Concentrate Storage and Treatment (7130-P01)	Mode 2
5. Solid Waste Processing (7045-P01, P02, P03, and P05)	Mode 1
6. Radiation Monitoring Computers (7005-P03)	Mode 1
7. Spent Fuel Cask Handling Crane (8200-P01)	12/1/86
8. Freeze Protection (5265-P02)	11/15/86

ATTACHMENT 2 TO LICENSE NPF-53

TDI DIESEL ENGINE REQUIREMENTS

1. Changes to the maintenance and surveillance programs for the TDI diesel engines, as identified in Shearon Harris SSER No. 4, shall be subject to the provisions of 10 CFR 50.59.

The frequency of the major engine overhauls referred to in the license conditions below shall be consistent with Section IV.1. "Overhaul Frequency" in Revision 2 of Appendix II of the Design Review/Quality Revalidation report which was transmitted by letter dated May 1, 1986, from J. George, Owners Group, to H. Denton, NRC.

2. Connecting rod assemblies shall be subjected to the following inspections at each major engine overhaul:
 - a. The surfaces of the rack teeth should be inspected for signs of fretting. If fretting has occurred, it should be subject to an engineering evaluation for appropriate corrective action.
 - b. All connecting-rod bolts should be lubricated in accordance with the engine manufacturer's instructions and torqued to the specifications of the manufacturer. The lengths of the two pairs of bolts above the crankpin should be measured ultrasonically pre- and post-tensioning.
 - c. The lengths of the two pairs of bolts above the crankpin should be measured ultrasonically prior to detensioning and disassembly of the bolts. If bolt tension is less than 93% of the value at installation, the cause should be determined, appropriate corrective action should be taken, and the interval between checks of bolt tension should be re-evaluated.
 - d. All connecting-rod bolts should be visually inspected for thread damage (e.g., galling), and the two pairs of connecting rod bolts above the crankpin should be inspected by magnetic particle testing (MT) to verify the continued absence of cracking. All washers used with the bolts should be examined visually for signs of galling or cracking, and replaced if damaged.
 - e. Visual inspection should be performed of all external surfaces of the link rod box to verify the absence of any signs of service induced distress.
 - f. All of the bolt holes in the link rod box should be inspected for thread damage (e.g., galling) or other signs of abnormalities. In addition, the bolt holes subject to the highest stresses (i.e.,

the pair immediately above the crankpin) should be examined with an appropriate nondestructive method to verify the continued absence of cracking. Any indications should be recorded for engineering evaluation and appropriate corrective action.

3. The cylinder blocks shall be subjected to the following inspections at the interval specified in the inspections:
 - a. Cylinder blocks shall be inspected for "ligament" cracks, "stud-to-stud" cracks and "stud-to-end" cracks as defined in a report* by Failure Analysis Associates, Inc. (FaAA) entitled, "Design Review of TDI R-4 and RV-4 Series Emergency Diesel Generator Cylinder Blocks" (FaAA report no. FaAA-84-9-11.1), dated December 1984. (Note that the FaAA report specifies additional inspections to be performed for blocks with "known" or "assumed" ligament cracks). The inspection intervals (i.e., frequency) shall not exceed the intervals calculated using the cumulative damage index model in the subject FaAA report. In addition, inspection method shall be consistent with or equivalent to those identified in the subject FaAA report.
 - b. In addition to inspections specified in the aforementioned FaAA report, blocks with "known" or "assumed ligament cracks" (as defined in the FaAA report) should be inspected at each refueling outage to determine whether or not cracks have initiated on the top surface exposed by the removal of two or more cylinder heads. This process should be repeated over several refueling outages until the entire block top has been inspected. Liquid-penetrant testing or a similarly sensitive nondestructive testing technique should be used to detect cracking, and eddy current should be used as appropriate to determine the depth of any cracks discovered.
 - c. If inspection reveals cracks in the cylinder blocks between stud holes of adjacent cylinders ("stud-to-stud" cracks) or "stud-to-end" cracks, this condition shall be reported promptly to the NRC staff and the affected engine shall be considered inoperable. The engine shall not be restored to "operable" status until the proposed disposition and/or corrective actions have been approved by the NRC staff.
4. The following air roll test shall be performed as specified below, except when the plant is already in an Action Statement of Technical Specification 3/4.8.1, "Electric Power Systems, A.C. Sources":

*This report was transmitted to H. Denton, NRC, from C. L. Rav, Jr., TDI Owners Group, by letter dated December 11, 1984.

The engines shall be rolled over with the airstart system and with the cylinder stopcocks open prior to each planned start, unless that start occurs within 4 hours of a shutdown. The engines shall also be rolled over with the airstart system and with the cylinder stopcocks open after 4 hours, but no more than 8 hours after engine shutdown and then rolled over once again approximately 24 hours after each shutdown. (In the event an engine is removed from service for any reason other than the rolling over procedure prior to expiration of the 8-hour or 24-hour periods noted above, that engine need not be rolled over while it is out of service. The licensees shall air roll the engine over with the stopcocks open at the time it is returned to service). The origin of any water detected in the cylinder must be determined and any cylinder head which leaks due to a crack shall be replaced. The above air roll test may be discontinued following the first refueling outage subject to the following conditions:

- a. All cylinder heads are Group III heads (i.e., cast after September 1980).
 - b. Quality revalidation inspections, as identified in the Design Review/Quality Revalidation report, have been completed for all cylinder heads.
 - c. Group III heads continue to demonstrate leak-free performance. This should be confirmed with TDI prior to deleting air roll tests.
5. Periodic inspections of the turbochargers shall include the following:
- a. The turbocharger thrust bearings should be visually inspected for excessive wear after 40 non-prelubed starts since the previous visual inspection.
 - b. Turbocharger rotor axial clearance should be measured at each refueling outage to verify compliance with TDI/Elliott specifications. In addition, thrust bearing measurements should be compared with measurements taken previously to determine a need for further inspection or corrective action.
 - c. Spectrographic and ferrographic engine oil analysis shall be performed quarterly to provide early evidence of bearing degradation. Particular attention should be paid to copper level and particulate size which could signify thrust bearing degradation.
6. Prior to restart following the first refueling, the engine base shall be inspected for degenerate microstructure (Widmanstaetan graphite) and the results submitted to the NRC for evaluation.
7. Prior to full power operation of Shearon Harris, the licensees shall provide the NRC with the following:

- a. The status of the Phase II component inspections. Any Phase II inspection that has not been completed by full power operation shall be completed by restart following the first refueling.
- b. The inspection frequencies in the maintenance matrix that are to be determined by the licensees.