

February 11, 2003

EA-03-009

Holders of Licenses for Operating
Pressurized Water Reactors as listed in
Attachment to the Enclosed Order

**SUBJECT: ISSUANCE OF ORDER ESTABLISHING INTERIM INSPECTION
REQUIREMENTS FOR REACTOR PRESSURE VESSEL HEADS AT
PRESSURIZED WATER REACTORS**

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Order that modifies the current license for your facility. The Order requires specific inspections of the reactor pressure vessel (RPV) head and associated penetration nozzles at pressurized water reactors (PWRs). The Order applies to all Addressees listed in the Attachment to the enclosed Order.

The discovery of leaks and nozzle cracking at the Davis-Besse Nuclear Power Station and other PWR plants has made clear the need for more effective inspections of RPV heads and associated penetration nozzles. The current RPV head inspection requirements require visual examination of the insulated surface or surrounding area for signs of leakage. Such inspections are not sufficient to reliably detect circumferential cracking of RPV head nozzles and corrosion of the RPV head. Circumferential cracking of RPV head nozzles and corrosion of the RPV head pose a safety concern because of the possibility of a nozzle ejection or loss-of-coolant accident if the conditions are not detected and repaired. The enclosed Order establishes interim requirements to ensure that licensees implement and maintain appropriate measures to inspect and, as necessary, repair RPV heads and associated penetration nozzles.

To address the immediate concerns raised by the increasing discovery of problems with RPV heads at PWRs, the NRC issued a series of bulletins and other communications, including Bulletin 2002-02, "Reactor Pressure Vessel Head and Vessel Head Penetration Nozzle Inspection Programs," dated August 9, 2002. Bulletin 2002-02 included the NRC request for licensees to provide information about their inspection programs and any plans to supplement existing visual inspections with volumetric and surface examinations. Most licensees responded to Bulletin 2002-02 with descriptions of their near-term inspection plans or with a schedule to submit such descriptions. Many of the licensees' responses to the Bulletin did not describe long-term inspection plans. Instead, licensees stated that they would follow guidance being developed by the industry-sponsored Materials Reliability Program (MRP).

The long-term resolution of this issue is expected to involve changes to the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) and will involve changes to the NRC regulations in 10 CFR 50.55a, "Codes and standards." The development of the NRC regulations, whether the rule adopts the ASME Code standards or defines separate requirements, will likely benefit from additional operating experience, continuing assessments, and research being conducted by the NRC and the MRP.

Although licensees' actions to date have provided reasonable assurance of adequate protection of public health and safety for the near-term operating cycles, the NRC deems it appropriate to establish a clear regulatory framework pending the revision of 10 CFR 50.55a. The enclosed Order imposes enhanced requirements for PWR licensees to inspect RPV heads and related penetration nozzles pending the revision of 10 CFR 50.55a. The requirements of the Order are immediately effective and are expected to remain in place until superseded by changes to 10 CFR 50.55a.

The enclosed Order requires responses and actions within specified time frames. Please contact your Licensing Project Manager regarding any issues related to compliance with the requirements in the enclosed Order, or if you have any other questions. In addition, the NRC is arranging a public meeting, tentatively scheduled for February 24, 2003, to discuss the Order with licensees and other stakeholders.

The enclosed Order has been forwarded to the Office of the Federal Register for publication.

Sincerely,

/RA/

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Enclosure: Order

cc w/encl: See next page*

* For a complete listing of all parties who received courtesy copies, see ADAMS Accession number ML030410402. In order to reduce size and weight of documents mailed, the enclosed plant mailing list is that associated with the specific facility noted.

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February 11, 2003

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
ALL PRESSURIZED WATER) Docket Nos. (as shown in Attachment 1)
REACTOR LICENSEES) License Nos. (as shown in Attachment 1)
) EA-03-009

**ORDER MODIFYING LICENSES
(EFFECTIVE IMMEDIATELY)**

I.

The Licensees identified in the Attachment to this Order hold licenses issued by the U.S. Nuclear Regulatory Commission (NRC or Commission) authorizing operation of pressurized water reactor (PWR) nuclear power plants in accordance with the Atomic Energy Act of 1954 and 10 C.F.R. Part 50.

II.

The reactor pressure vessel (RPV) heads of PWRs have penetrations for control rod drive mechanisms and instrumentation systems. Nickel-based alloys (e.g., Alloy 600) are used in the penetration nozzles and related welds. Primary coolant water and the operating conditions of PWR plants can cause cracking of these nickel-based alloys through a process called primary water stress corrosion cracking (PWSCC). The susceptibility of RPV head penetrations to PWSCC appears to be strongly linked to the operating time and temperature of the RPV head. Problems related to PWSCC have therefore increased as plants have operated for longer periods of time. Inspections of the RPV head nozzles at the Oconee Nuclear Station, Units 2 and 3 (Oconee), in early 2001 identified circumferential cracking of the nozzles above the J-groove weld, which joins the nozzle to the RPV head. Circumferential cracking above the

J-groove weld is a safety concern because of the possibility of a nozzle ejection if the circumferential cracking is not detected and repaired.

Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), which is incorporated into NRC regulations by 10 C.F.R. 50.55a, "Codes and standards," currently specifies that inspections of the RPV head need only include a visual check for leakage on the insulated surface or surrounding area. These inspections may not detect small amounts of leakage from an RPV head penetration with cracks extending through the nozzle or the J-groove weld. Such leakage can create an environment that leads to circumferential cracks in RPV head penetration nozzles or corrosion of the RPV head. In response to the inspection findings at Oconee and because existing requirements in the ASME Code and NRC regulations do not adequately address inspections of RPV head penetrations for degradation due to PWSCC, the NRC issued Bulletin 2001-01, "Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles," dated August 3, 2001. In response to the Bulletin, PWR Licensees provided their plans for inspecting RPV head penetrations and the outside surface of the heads to determine whether any nozzles were leaking.

In early March 2002, while conducting inspections of reactor vessel head penetrations prompted by Bulletin 2001-01, the Licensee for the Davis-Besse Nuclear Power Station (Davis-Besse) identified a cavity in the reactor vessel head near the top of the dome. The cavity was next to a leaking nozzle with a through-wall axial crack and was in an area of the reactor vessel head that the Licensee had left covered with boric acid deposits for several years. On March 18, 2002, the NRC issued Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," which requested PWR Licensees to provide information on their reactor vessel head inspection and maintenance programs, the material condition of their reactor vessel heads, and their boric acid inspection programs. In their responses, the Licensees provided information about their boric acid

inspection programs and their inspections and assessments to ensure that their respective plant did not have reactor vessel head degradation like that identified at Davis-Besse.

The experience at Davis-Besse and the discovery of leaks and nozzle cracking at other plants reinforced the need for more effective inspections of RPV head penetration nozzles. The absence of an effective inspection regime could, over time, result in unacceptable circumferential cracks in RPV head penetration nozzles or in the degradation of the RPV head by corrosion. These degradation mechanisms increase the probability of a more significant loss of reactor coolant pressure boundary through ejection of a nozzle or other rupture of the RPV head. The NRC issued Bulletin 2002-02, "Reactor Pressure Vessel Head and Vessel Head Penetration Nozzle Inspection Programs," dated August 9, 2002, requesting that Licensees provide information about their inspection programs and any plans to supplement existing visual inspections with additional measures (e.g., volumetric and surface examinations). Licensees have responded to Bulletin 2002-02 with descriptions of their inspection plans for at least the first refueling outage following the issuance of Bulletin 2002-02 or with a schedule to submit such descriptions before the next refueling outage. Many of the Licensees' responses to Bulletin 2002-02 did not describe long-term inspection plans. Instead the Licensees stated that they would follow guidance being developed by the industry-sponsored Materials Reliability Program.

Inspections performed at several PWR plants in late 2002 found leakage and cracks in nozzles or J-groove welds that have required repairs or prompted the replacement of the RPV head. In addition, as discussed in NRC Information Notice 2003-02, "Recent Experience with Reactor Coolant System Leakage and Boric Acid Corrosion," issued January 16, 2003, leakage has recently occurred at some plants from connections above the RPV head and has required additional assessments and inspections to ensure that the leakage has not caused significant degradation of RPV heads.

III.

Based on recent experience, current inspection requirements in the ASME Code and related NRC regulations do not provide adequate assurance that reactor coolant pressure boundary integrity will be maintained for all combinations of construction materials, operating conditions, and operating histories at PWRs. The long-term resolution of RPV head penetration inspection requirements is expected to involve changes to the ASME Code and NRC regulations, specifically 10 C.F.R. 50.55a. Research being conducted by the NRC and industry is increasing our understanding of material performance, improving inspection capabilities, and supporting assessments of the risks to public health and safety associated with potential degradation of the RPV head and associated penetration nozzles. These research activities are important to the long term development of revisions to the ASME Code and NRC regulations.

The operating history of PWRs supports a general correlation among certain operating parameters, including the length of time plants have been in operation, and the likelihood of occurrence of PWSCC of nickel-based alloys used in RPV head penetration nozzles. Bulletin 2002-02 presented a three-tier categorization of susceptibility to RPV head penetration nozzle degradation based on reactor operating durations and temperatures. Licensees' responses to the Bulletin included an estimate of the effective degradation years (EDY) and the appropriate categorization of each plant into one of the three susceptibility categories. Each Licensee proposed an inspection plan for RPV head penetrations based upon the susceptibility to degradation via PWSCC (as represented by the value of EDY calculated for the facility). In addition, recent operating experience has shown that, under certain conditions, leakage from mechanical and welded connections above the RPV head can lead to the degradation of the low alloy steel head by boric acid corrosion.

Revising the ASME Code and subsequently the NRC regulations will take several years. The Licensees' actions to date in response to the NRC bulletins have provided reasonable assurance of adequate protection of public health and safety for the near term operating cycles, but cannot be relied upon to do so for the entire interim period until NRC regulations are revised. Additional periodic inspections of RPV heads and associated penetration nozzles at PWRs, as a function of the unit's susceptibility to PWSCC and as appropriate to address the discovery of boron deposits, are necessary to provide reasonable assurance that plant operations do not pose an undue risk to the public health and safety. Consequently, it is necessary to establish a minimum set of RPV head inspection requirements, as a supplement to existing inspection and other requirements in the ASME Code and NRC regulations, through the issuance of an Order to PWR Licensees.

It is appropriate and necessary to the protection of public health and safety to establish a clear regulatory framework, pending the development of consensus standards and incorporation of revised inspection requirements into 10 C.F.R. 50.55a, directly or through reference to a future version of the ASME Code. In order to provide reasonable assurance of adequate protection of public health and safety for the interim period, all PWR Licenses identified in the Attachment to this Order shall be modified to include the inspection requirements for RPV heads and associated penetration nozzles identified in Section IV of this Order. The NRC requirements imposed by this Order are based on the body of evidence available through February 2003. Continuing research and operating experience may support future changes to the requirements imposed through this Order. In addition, pursuant to 10 C.F.R. 2.202, I find that in the circumstances described above, the public health, safety, and interest require that this Order be immediately effective.

IV.

Accordingly, pursuant to Sections 103, 104b, 161b, 161i, 161o, 182, and 186 of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 C.F.R. § 2.202 and 10 C.F.R. Part 50, IT IS HEREBY ORDERED, **EFFECTIVE IMMEDIATELY**, THAT ALL LICENSES IDENTIFIED IN THE ATTACHMENT TO THIS ORDER ARE MODIFIED AS FOLLOWS:

- A. To determine the required inspection(s) for each refueling outage at their facility, all Licensees shall calculate the susceptibility category of each reactor vessel head to PWSCC-related degradation, as represented by a value of EDY for the end of each operating cycle, using the following equation:

$$EDY = \sum_{j=1}^n \left\{ \Delta EFPY_j \exp \left[- \frac{Q_i}{R} \left(\frac{1}{T_{head,j}} - \frac{1}{T_{ref}} \right) \right] \right\}$$

where:

EDY	=	total effective degradation years, normalized to a reference temperature of 600°F
$\Delta EFPY_j$	=	operating time in years at $T_{head,j}$
Q_i	=	activation energy for crack initiation (50 kcal/mole)
R	=	universal gas constant (1.103×10^{-3} kcal/mole °R)
$T_{head,j}$	=	100% power head temperature during time period j ($^{\circ}R = ^{\circ}F + 459.67$)
T_{ref}	=	reference temperature (600°F = 1059.67°R)
n	=	number of different head temperatures during plant history

This calculation shall be performed with best estimate values for each parameter at the end of each operating cycle for the RPV head that will be in service during the subsequent operating cycle. The calculated value of EDY shall determine the susceptibility category and the appropriate inspection for the RPV head during each refueling outage.

B. All Licensees shall use the following criteria to assign the RPV head at their facility to the appropriate PWSCC susceptibility category:

High (1) Plants with a calculated value of EDY greater than 12, OR

(2) Plants with an RPV head that has experienced cracking in a penetration nozzle or J-groove weld due to PWSCC.

Moderate Plants with a calculated value of EDY less than or equal to 12 and greater than or equal to 8 AND no previous inspection findings requiring classification as High.

Low Plants with a calculated value of EDY less than 8 AND no previous inspection findings requiring classification as High.

C. All Licensees shall perform inspections of the RPV head ¹ using the following techniques and frequencies²:

¹ This Order imposes additional inspection requirements. Licensees are required to address any findings from these inspections (i.e., perform analyses and repairs) in accordance with existing requirements in the ASME Code and 10 C.F.R. 50.55a. The NRC has issued guidance to address flaw evaluations for RPV head penetration nozzles (see letter dated November 21, 2001, from J. Strosnider, NRC, to A. Marion, Nuclear Energy Institute) and will, as necessary, issue revised guidance pending the updating of the ASME Code and related NRC regulations.

² The requirements of this Order are generally consistent with inspection plans that the NRC staff accepted in letters to some Licensees regarding their responses to Bulletin 2002-02. If the NRC staff has already accepted a specific variation from the requirements of this Order (e.g., inspections to less than two (2) inches above the J-groove weld), the Licensee may continue with the previously accepted inspection plan for the next refueling outage after issuance of this Order, provided that in its response to this Order the Licensee identifies all discrepancies between the requirements of this Order and the previously accepted inspection plan. Licensees proposing to deviate from the requirements of this Order for subsequent refueling outages shall seek relaxation of this Order pursuant to the procedure specified at the end of this Section.

- (1) For those plants in the High category, RPV head and head penetration nozzle inspections shall be performed using the following techniques every refueling outage.³
 - (a) Bare metal visual examination of 100% of the RPV head surface (including 360° around each RPV head penetration nozzle), AND
 - (b) Either:
 - (i) Ultrasonic testing of each RPV head penetration nozzle (i.e., nozzle base material) from two (2) inches above the J-groove weld to the bottom of the nozzle and an assessment to determine if leakage has occurred into the interference fit zone, OR
 - (ii) Eddy current testing or dye penetrant testing of the wetted surface of each J-Groove weld and RPV head penetration nozzle base material to at least two (2) inches above the J-groove weld.
- (2) For those plants in the Moderate category, RPV head and head penetration inspections shall be performed such that at least the requirements of 2(a) or 2(b) are performed each refueling outage. In addition the requirements of 2(a) and 2(b) shall each be performed at least once over the course of every two (2) refueling outages.
 - (a) Bare metal visual examination of 100% of the RPV head surface (including 360° around each RPV head penetration nozzle).

³ For repaired RPV head penetration nozzles that establish a new pressure boundary, the ultrasonic testing inspection shall include the weld and at least one (1) inch above the weld in the nozzle base material. For RPV head penetration nozzles or J-groove welds repaired using a weld overlay, the overlay shall be examined by either ultrasonic, eddy current, or dye penetrant testing in addition to the examinations required by (1)(b)(i) or (1)(b)(ii).

- (b) Either:
 - (i) Ultrasonic testing of each RPV head penetration nozzle (i.e., nozzle base material) from two (2) inches above the J-groove weld to the bottom of the nozzle and an assessment to determine if leakage has occurred into the interference fit zone, OR
 - (ii) Eddy current testing or dye penetrant testing of the wetted surface of each J-Groove weld and RPV head penetration nozzle base material to at least two (2) inches above the J-groove weld.
- (3) For those plants in the Low category, RPV head and head penetration nozzle inspections shall be performed as follows. An inspection meeting the requirements of 3(a) must be completed at least every third refueling outage or every five (5) years, whichever occurs first. If an inspection meeting the requirements of 3(a) was not performed during the refueling outage immediately preceding the issuance of this Order, the Licensee must complete an inspection meeting the requirements of 3(a) within the first two (2) refueling outages following issuance of this Order. The requirements of 3(b) must be completed at least once over the course of five (5) years after the issuance of this Order and thereafter at least every four (4) refueling outages or every seven (7) years, whichever occurs first.
 - (a) Bare metal visual examination of 100% of the RPV head surface (including 360° around each RPV head penetration nozzle).
 - (b) Either:
 - (i) Ultrasonic testing of each RPV head penetration nozzle (i.e., nozzle base material) from two (2) inches above the J-groove

weld to the bottom of the nozzle and an assessment to determine if leakage has occurred into the interference fit zone, OR

- (ii) Eddy current testing or dye penetrant testing of the wetted surface of each J-Groove weld and RPV head penetration nozzle base material to at least two (2) inches above the J-groove weld.

- D. During each refueling outage, visual inspections shall be performed to identify potential boric acid leaks from pressure-retaining components above the RPV head. For any plant with boron deposits on the surface of the RPV head or related insulation, discovered either during the inspections required by this Order or otherwise and regardless of the source of the deposit, before returning the plant to operation the Licensee shall perform inspections of the affected RPV head surface and penetrations appropriate to the conditions found to verify the integrity of the affected area and penetrations.
- E. For each inspection required in Paragraph C, the Licensee shall submit a report detailing the inspection results within sixty (60) days after returning the plant to operation.⁴ For each inspection required in Paragraph D, the Licensee shall submit a report detailing the inspection results within sixty (60) days after returning the plant to operation if a leak or boron deposit was found during the inspection.
- F. In the response required by Section V of this Order, all Licensees shall notify the Commission if: (1) they are unable to comply with any of the requirements of Section IV, or (2) compliance with any of the requirements of Section IV is unnecessary. Licensees proposing to deviate from the requirements of this Order shall seek relaxation of this Order pursuant to the procedure specified below.

⁴ This reporting requirement supercedes the 30-day reports requested by NRC Bulletin 2002-02.

The Director, Office of Nuclear Reactor Regulation, may, in writing, relax or rescind any of the above conditions upon demonstration by the Licensee of good cause. A request for relaxation regarding inspection of specific nozzles shall also address the following criteria:

- (1) The proposed alternative(s) for inspection of specific nozzles will provide an acceptable level of quality and safety, or
- (2) Compliance with this Order for specific nozzles would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Requests for relaxation associated with specific penetration nozzles will be evaluated by the NRC staff using its procedure for evaluating proposed alternatives to the ASME Code in accordance with 10 C.F.R. 50.55a(a)(3).

V.

In accordance with 10 C.F.R. § 2.202, the Licensee must, and any other person adversely affected by this Order may, submit an answer to this Order, and may request a hearing on this Order, within twenty (20) days of the date of this Order. Where good cause is shown, consideration will be given to extending the time to request a hearing. A request for extension of time in which to submit an answer or request a hearing must be made in writing to the Director, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and include a statement of good cause for the extension. The answer may consent to this Order. Unless the answer consents to this Order, the answer shall, in writing and under oath or affirmation, specifically set forth the matters of fact and law on which the Licensee or other person adversely affected relies and the reasons as to why the Order should not have been issued. Any answer or request for a hearing shall be submitted to the Secretary, Office of the Secretary of the Commission, U.S. Nuclear Regulatory Commission, ATTN: Rulemakings and Adjudications Staff, Washington, DC 20555. Copies shall also be sent

to the Director, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555; to the Assistant General Counsel for Materials Litigation and Enforcement at the same address; to the Regional Administrator for NRC Region I, II, III, or IV, as appropriate for the specific plant; and to the Licensee if the answer or hearing request is by a person other than the Licensee. Because of possible disruptions in delivery of mail to United States Government offices, it is requested that answers and requests for hearing be transmitted to the Secretary of the Commission either by means of facsimile transmission to 301-415-1101 or by e-mail to hearingdocket@nrc.gov and also to the Assistant General Counsel for Materials Litigation and Enforcement either by means of facsimile transmission to 301-415-3725 or by e-mail to OGCMailCenter@nrc.gov. If a person other than the Licensee requests a hearing, that person shall set forth with particularity the manner in which his interest is adversely affected by this Order and shall address the criteria set forth in 10 C.F.R. § 2.714(d).⁵

If a hearing is requested by the Licensee or a person whose interest is adversely affected, the Commission will issue an Order designating the time and place of any hearing. If a hearing is held, the issue to be considered at such hearing shall be whether this Order should be sustained.

Pursuant to 10 C.F.R. § 2.202(c)(2)(i), the Licensee may, in addition to demanding a hearing at the time the answer is filed or sooner, move the presiding officer to set aside the immediate effectiveness of the Order on the ground that the Order, including the need for immediate effectiveness, is not based on adequate evidence but on mere suspicion, unfounded allegations, or error.

⁵ The version of Title 10 of the *Code of Federal Regulations*, published January 1, 2002, inadvertently omitted the last sentence of 10 C.F.R. 2.714 (d) and paragraphs (d)(1) and (d)(2) regarding petitions to intervene and contentions. For the complete, corrected text of 10 C.F.R 2.714 (d), please see 67 FR 20884, April 29, 2002.

In the absence of any request for hearing, or written approval of an extension of time in which to request a hearing, the provisions specified in Section IV above shall be final twenty (20) days from the date of this Order without further order or proceedings. If an extension of time for requesting a hearing has been approved, the provisions specified in Section IV shall be final when the extension expires if a hearing request has not been received. AN ANSWER OR A REQUEST FOR HEARING SHALL NOT STAY THE IMMEDIATE EFFECTIVENESS OF THIS ORDER.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Dated this 11th day of February 2003

<u>Facilities</u>	<u>Addressee</u>
Beaver Valley Power Station, Units 1 and 2 Docket Nos. 50-334 and 50-412 License Nos. DPR-66 and NPF-73	Mr. Mark B. Bezilla Vice President FirstEnergy Nuclear Operating Company Beaver Valley Power Station Post Office Box 4 Shippingport, PA 15077
Calvert Cliffs Nuclear Power Plant, Units 1 and 2 Docket Nos. 50-317 and 50-318 License Nos. DPR-53 and DPR-69	Mr. P. E. Katz, Vice President Calvert Cliffs Nuclear Power Plant, Inc. Calvert Cliffs Nuclear Power Plant 1650 Calvert Cliffs Parkway Lusby, MD 20657-4702
R. E. Ginna Nuclear Power Plant Docket No. 50-244 License No. DPR-18	Dr. Robert C. Mecredy Vice President, Nuclear Operations Rochester Gas and Electric Corporation 89 East Avenue Rochester, NY 14649
Indian Point Nuclear Generating Station, Units 2 and 3 Docket Nos. 50-247 and 50-286 License Nos. DPR-26 and DPR-64	Mr. Michael R. Kansler Senior Vice President and Chief Operating Officer Entergy Nuclear Operations, Inc. 440 Hamilton Avenue White Plains, NY 10601
Millstone Power Station, Units 2 and 3 Docket Nos. 50-336 and 50-423 License Nos. DPR-65 and NPF-49	Mr. J. A. Price Site Vice President - Millstone Dominion Nuclear Connecticut, Inc. c/o Mr. David W. Dodson Rope Ferry Road Waterford, CT 06385
Salem Nuclear Generating Station, Units 1 and 2 Docket Nos. 50-272 and 50-311 License Nos. DPR-70 and DPR-75	Mr. Harold W. Keiser Chief Nuclear Officer & President PSEG Nuclear LLC - X04 Post Office Box 236 Hancocks Bridge, NJ 08038
Seabrook Station, Unit 1 Docket No. 50-443 License No. NPF-86	Mr. Mark E. Warner, Site Vice President c/o James M. Peschel Seabrook Station PO Box 300 Seabrook, NH 03874
Three Mile Island Nuclear Station, Unit 1 Docket No. 50-289 License No. DPR-50	Mr. John L. Skolds, Chairman and Chief Executive Officer AmerGen Energy Company, LLC 4300 Winfield Road Warrenville, IL 60555

Catawba Nuclear Station, Units 1 and 2 Docket Nos. 50-413 and 50-414 License Nos. NPF-35 and NPF-52	Mr. G. R. Peterson Site Vice President Catawba Nuclear Station Duke Energy Corporation 4800 Concord Road York, South Carolina 29745-9635
Crystal River Nuclear Power Plant Docket No. 50-302 License No. DPR-72	Mr. Dale E. Young, Vice President Crystal River Nuclear Plant (NA1B) ATTN: Supervisor, Licensing & Regulatory Programs 15760 W. Power Line Street Crystal River, Florida 34428-6708
Joseph M. Farley Nuclear Plant, Units 1 and 2 Docket Nos. 50-348 and 50-364 License Nos. NPF-2 and NPF-8	Mr. J. B. Beasley Vice President - Farley Project Southern Nuclear Operating Company, Inc. Post Office Box 1295 Birmingham, Alabama 35201-1295
Shearon Harris Nuclear Power Plant, Unit 1 Docket No. 50-400 License No. NPF-63	Mr. James Scarola, Vice President Shearon Harris Nuclear Power Plant Carolina Power & Light Company Post Office Box 165, Mail Code: Zone 1 New Hill, North Carolina 27562-0165
William B. McGuire Nuclear Station, Units 1 and 2 Docket Nos. 50-369 and 50-370 License Nos. NPF-9 and NPF-17	Mr. Dhiaa Jamil Vice President, McGuire Site Duke Energy Corporation 12700 Hagers Ferry Road Huntersville, NC 28078-8985
North Anna Power Station, Units 1 and 2 Docket Nos. 50-338 and 50-339 License Nos. NPF-4 and NPF-7	Mr. David A. Christian Senior Vice President - Nuclear Virginia Electric and Power Company 5000 Dominion Blvd. Glen Allen, Virginia 23060
Surry Power Station, Units 1 and 2 Docket Nos. 50-280 and 50-281 License Nos. DPR-32 and DPR-37	

Oconee Nuclear Station, Units 1, 2 and 3 Docket Nos. 50-269, 50-270 and 50-287 License Nos. DPR-38, DPR-47 and DPR-55	Mr. Ronald A. Jones Vice President, Oconee Site Duke Energy Corporation 7800 Rochester Highway Seneca, SC 29672
H. B. Robinson Steam Electric Plant, Unit 2 Docket No. 50-261 License No. DPR-23	Mr. J. W. Moyer, Vice President Carolina Power & Light Company H. B. Robinson Steam Electric Plant Unit No. 2 3581 West Entrance Road Hartsville, South Carolina 29550
St. Lucie Nuclear Plant, Units 1 and 2 Docket Nos. 50-335 and 50-389 License Nos. DPR-67 and NPF-16	Mr. J. A. Stall Senior Vice President, Nuclear and Chief Nuclear Officer Florida Power and Light Company P.O. Box 14000 Juno Beach, Florida 33408-0420
Turkey Point Nuclear Generating Station, Units 3 and 4 Docket Nos. 50-250 and 50-251 License Nos. DPR-31 and DPR-41	
Sequoyah Nuclear Plant, Units 1 and 2 Docket Nos. 50-327 and 50-328 License Nos. DPR-77 and DPR-79	Mr. J. A. Scalice Chief Nuclear Officer and Executive Vice President Tennessee Valley Authority 6A Lookout Place 1101 Market Street Chattanooga, Tennessee 37402-2801
Watts Bar Nuclear Plant, Unit 1 Docket No. 50-390 License No. NPF-90	
Virgil C. Summer Nuclear Station, Unit 1 Docket No. 50-395 License No. NPF-12	Mr. Stephen A. Byrne Senior Vice President, Nuclear Operations South Carolina Electric & Gas Company Virgil C. Summer Nuclear Station Post Office Box 88 Jenkinsville, South Carolina 29065
Vogtle Electric Generating Plant, Units 1 and 2 Docket Nos. 50-424 and 50-425 License Nos. NPF-68 and NPF-81	Mr. J. T. Gasser Vice President - Vogtle Project Southern Nuclear Operating Company, Inc. Post Office Box 1295 Birmingham, Alabama 35201-1295

Braidwood Station, Units 1 and 2 Docket Nos. STN 50-456 and STN 50-457 License Nos. NPF-72 and NPF-77	Mr. John L. Skolds, President Exelon Nuclear Exelon Generation Company, LLC 4300 Winfield Road Warrenville, IL 60555
Byron Station, Units 1 and 2 Docket No.s STN 50-454 and STN 50-455 License Nos. NPF-37 and NPF-66	
Donald C. Cook Nuclear Plant, Units 1 and 2 Docket Nos. 50-315 and 50-316 License Nos. DPR-58 and DPR-74	Mr. A. Christopher Bakken III, Senior Vice President and Chief Nuclear Officer Indiana Michigan Power Company Nuclear Generation Group 500 Circle Drive Buchanan, MI 49107
Davis-Besse Nuclear Power Station, Unit 1 Docket No. 50-346 License No. NPF-3	Mr. Lew W. Myers Chief Operating Officer FirstEnergy Nuclear Operating Company Davis-Besse Nuclear Power Station 5501 North State Route 2 Oak Harbor, OH 43449-9760
Kewaunee Nuclear Power Plant Docket No. 50-305 License No. DPR-43	Mr. Thomas Coutu Site Vice President and Interim Plant Manager Kewaunee Nuclear Power Plant Nuclear Management Company, LLC N490 State Highway 42 Kewaunee, WI 54216
Palisades Plant Docket No. 50-255 License No. DPR-20	Mr. Douglas E. Cooper Site Vice President Palisades Nuclear Plant 27780 Blue Star Memorial Highway Covert, MI 49043
Point Beach Nuclear Plant, Units 1 and 2 Docket Nos. 50-266 and 50-301 License Nos. DPR-24 and DPR-27	Mr. Fred J. Cayia Site Vice President Point Beach Nuclear Plant Nuclear Management Company, LLC 6610 Nuclear Road Two Rivers, WI 54241
Prairie Island Nuclear Generating Plant, Units 1 and 2 Docket Nos. 50-282 and 50-306 License Nos. DPR-42 and DPR-60	Mr. Mano Nazar Site Vice President Prairie Island Nuclear Generating Plant Nuclear Management Company, LLC 1717 Wakonade Drive East Welch, MN 55089

Arkansas Nuclear One, Units 1 and 2 Docket Nos. 50-313 and 50-368 License Nos. DPR-51 and NPF-6	Mr. Craig G. Anderson Vice President, Operations ANO Entergy Operations, Inc. 1448 S. R. 333 Russellville, AR 72801
Callaway Plant, Unit 1 Docket No. 50-483 License No. NPF-30	Mr. Garry L. Randolph Vice President and Chief Nuclear Officer Union Electric Company Post Office Box 620 Fulton, MO 65251
Comanche Peak Steam Electric Station, Units 1 and 2 Docket Nos. 50-445 and 50-446 License Nos. NPF-87 and NPF-89	Mr. C. Lance Terry Senior Vice President & Principal Nuclear Officer TXU Energy ATTN: Regulatory Affairs P. O. Box 1002 Glen Rose, TX 76043
Diablo Canyon Nuclear Power Plant, Units 1 and 2 Docket Nos. 50-275 and 50-323 License Nos. DPR-80 and DPR-82	Mr. Gregory M. Rueger Senior Vice President, Generation and Chief Nuclear Officer Pacific Gas and Electric Company Diablo Canyon Nuclear Power Plant P. O. Box 3 Avila Beach, CA 93424
Fort Calhoun Station, Unit 1 Docket No. 50-285 License No. DPR-40	Mr. R. T. Ridenoure Division Manager - Nuclear Operations Omaha Public Power District Fort Calhoun Station FC-2-4 Adm. Post Office Box 550 Fort Calhoun, NE 68023-0550
Palo Verde Nuclear Generating Station, Units 1, 2 and 3 Docket Nos. STN 50-528, STN 50-529 and STN 50-530 License Nos. NPF-41, NPF-51 and NPF-74	Mr. Gregg R. Overbeck Senior Vice President, Nuclear Arizona Public Service Company P. O. Box 52034 Phoenix, AZ 85072-2034
San Onofre Nuclear Station, Units 2 and 3 Docket Nos. 50-361 and 50-362 License Nos. NPF-10 and NPF-15	Mr. Harold B. Ray Executive Vice President Southern California Edison Company San Onofre Nuclear Generating Station P.O. Box 128 San Clemente, CA 92674-0128

<p>South Texas Project Electric Generating Station, Units 1 and 2 Docket Nos. 50-498 and 50-499 License Nos. NPF-76 and NPF-80</p>	<p>Mr. William T. Cottle President and Chief Executive Officer STP Nuclear Operating Company South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, TX 77483</p>
<p>Waterford Steam Electric Generating Station, Unit 3 Docket No. 50-382 License No. NPF-38</p>	<p>Mr. Joseph E. Venable Vice President Operations Entergy Operations, Inc. 17265 River Road Killona, LA 70066-0751</p>
<p>Wolf Creek Generating Station, Unit 1 Docket No. 50-482 License No. NPF-42</p>	<p>Mr. Rick A. Muench President and Chief Executive Officer Wolf Creek Nuclear Operating Corporation Post Office Box 411 Burlington, KS 66839</p>