



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

November 19, 1999

Q. Lee
50-348/364

The Honorable Paul D. Coverdell
United States Senator
100 Colony Square, Suite 300
1175 Peachtree Street, N.E.
Atlanta, Georgia 30361

Dear Senator Coverdell:

I am responding to your letters of October 5 and October 27, 1999, to Dennis Rathbun, in which you asked the U.S. Nuclear Regulatory Commission (NRC) staff to review correspondence provided by John Sherman regarding the year 2000 (Y2K) readiness of Farley Nuclear Plant, Unit 2. On September 10, 1999, we provided you with a response to Mr. Sherman's letter of August 2, 1999, on the same issue.

In his October 5 letter, Mr. Sherman again expresses his concern about the Y2K readiness of Farley Unit 2. More specifically, his concerns involved two issues: 1) the capabilities for cooling down Farley, and all other nuclear power plants, in the event of electrical grid failures associated with the Y2K transition and 2) the failure rates of emergency diesel generators (EDGs). Mr. Sherman sent you additional information which you forwarded to us by letter of October 27, 1999, that expressed concern over the lack of independent reviews of the U.S. industry's Y2K testing and emergency exercises.

On November 8, 1999, two members of my staff called Mr. Sherman to discuss his concerns. He expressed appreciation that we called and the phone call appeared to satisfy Mr. Sherman's concerns. We also promised to send Mr. Sherman a written response.

In response to the Y2K readiness of Farley Nuclear Plant, both Units 1 and 2 are now Y2K ready. Farley Unit 2 Y2K modifications and testing were completed after the unit was shut down for a refueling outage on October 15, 1999. Specifically, while the unit was shut down, computer software on its system that controls the steam turbine was modified and tested. A similar modification had been successfully implemented and tested on Unit 1. NRC inspection staff recently confirmed completion of the modification on Unit 2.

I am pleased to report that, as of November 4, NRC has determined that all nuclear power plants are Y2K ready. The safe operation of the nuclear power plants is expected to contribute to a stable and reliable grid during the Y2K transition.

Regarding Mr. Sherman's concern about electric grid failure, in order to protect against primary power outages, Farley Nuclear Plant, as well as other nuclear power plants, depend primarily on the external electricity supply which is referred to as the offsite power source. However, nuclear power plants are required to be protected against loss of offsite power by providing an onsite backup power system which, for nearly all nuclear power plants, is powered by EDGs. In addition, Farley, as well as other nuclear power plants, is required by the regulations to have the capability to withstand the loss of all AC power for an established period of time. The loss

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operability, availability, and reliability. Additionally, EDG reliability in emergency situations has been high, as demonstrated during weather-related power upsets. For example, following the 1992 landfall of Hurricane Andrew at the Turkey Point nuclear power plant, EDGs operated reliably for approximately 6 days providing electrical power to plant systems. Therefore, we do not consider it necessary to impose additional EDG requirements on licensees during Y2K critical dates.

I hope that this information is responsive to Mr. Sherman's continuing concerns. Please do not hesitate to contact us if you have any questions regarding this matter.

Sincerely,

William D. Travers
Executive Director
for Operations

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regulatory and technical specification requirements provide a high confidence in EDG operability, availability, and reliability. Additionally, EDG reliability in emergency situations has been high, as demonstrated during weather-related power upsets. For example, following the 1992 landfall of Hurricane Andrew at the Turkey Point nuclear power plant, EDGs operated reliably for approximately six days providing electrical power to plant systems. Therefore, we do not consider it necessary to impose additional EDG requirements on licensees during Y2K critical dates.

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of all AC power is generally referred to as "station blackout" (SBO). On the basis of current information from the North American Electric Reliability Council (NERC), it appears highly unlikely that availability of offsite power from the electrical grid will be significantly affected by Y2K-induced problems. According to NERC's latest report of August 3, 1999, more than 90 percent of the Nation's electricity supply is classified as Y2K ready or as Y2K ready with limited exceptions, and 96 percent of all local distribution systems are certified ready for the Year 2000. In its reports issued January 11 and April 30, 1999, NERC states, "Transmission outages are expected to be minimal and outages that may occur are anticipated to be mitigated by reduced energy transfer established as part of the contingency planning process." These reports indicate that the transition through critical Y2K rollover dates should have minimal impact on electrical systems operations in North America and that widespread, long-term loss of the grid as a result of Y2K-induced events is not a credible scenario.

Mr. Sherman expressed concern about the time it takes to safely cool down a reactor. Under normal conditions, it takes several hours to safely shut down a nuclear power plant by gradually reducing reactor power. However, in an emergency, the reactor can be shut down safely within seconds, either automatically or manually. Nuclear power plants employ cooling systems to safely remove heat from the reactor core. Typically, the reactor core can be safely cooled down in about a day. Following a reactor shutdown, decaying fission byproducts continue to produce heat in the core. This heat generation process subsides as time passes and eventually reaches a point at which cooling water is not necessary. At that point, the core will remain cool by simply transferring to the surroundings the small amount of decay heat that remains. The perception that it takes months to cool the core has merit if the reference point is the time when it is no longer necessary to provide cooling water. However, the cooling systems in place are required by NRC regulations to be available and are designed to cool the reactor core in a safe, timely, and controlled manner. These cooling systems undergo routine, periodic tests, to ensure that they will function reliably, if called upon.

Mr. Sherman expressed concern regarding EDG failure rate. The Farley Nuclear Plant backup power system employs four EDGs. In addition, a fifth EDG is utilized as an alternative AC power source. EDGs are designed and configured to provide power to necessary systems and equipment for maintaining adequate core cooling upon offsite power unavailability. NRC regulations require EDGs to be highly reliable and licensees to demonstrate EDG operability by test on a regular basis. For example, in 1993 the industry-wide average reliability of diesel generators was in excess of 0.98, or 98 percent. This means that diesel generators successfully started 98 times for every 100 attempts.

Therefore, the possibility of electric grid instabilities and blackouts during Y2K critical dates has been addressed by NRC, NERC, and licensees. The scope of licensee Y2K programs, including contingency planning, covers the onsite power and other emergency power systems at the plants, including EDGs. NRC audits and reviews of licensee Y2K program activities to date have verified licensee consideration of these systems, and no associated Y2K issues relating to onsite or emergency power systems have been identified. Moreover, licensees are taking anticipatory measures for the Y2K transition, including completing surveillances and ensuring that EDG fuel supplies are "topped off." Existing regulatory and technical specification requirements provide high confidence in EDG operability, availability, and

operability, availability, and reliability. Additionally, EDG reliability in emergency situations has been high, as demonstrated during weather-related power upsets. For example, following the 1992 landfall of Hurricane Andrew at the Turkey Point nuclear power plant, EDGs operated reliably for approximately 6 days providing electrical power to plant systems until offsite power was restored. Therefore, we do not consider it necessary to impose additional EDG requirements on licensees during Y2K critical dates.

I hope that this information is responsive to Mr. Sherman's continuing concerns. Please do not hesitate to contact us if you have any questions regarding this matter.

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Executive Director
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Honorable P. D. Coverdell

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Typically, Y2K QA measures are an outgrowth of nuclear QA programs and processes that are required by NRC regulations to be in place at all nuclear reactors. They provide an independent assurance in the quality of programs and processes at nuclear facilities. NRC reviews, conducted at each operating reactor site, confirmed that licensees have implemented these QA measures to provide a high level of confidence in their Y2K programs. Additionally, industry reports indicate that internal and external audits have been conducted as part of the licensee's Y2K QA program.

External reviews of plant modifications or maintenance activities are performed by an independent group, such as the licensee's Quality Assurance Group, or a peer group from an external organization. The results and recommendations from these reviews are provided to licensee senior management as a means of improving the licensee's internal processes. In the case of Y2K-readiness preparations, these peer group reviews were conducted by groups consisting of members from other licensees, industry experts, and members of the NEI staff. Several of these peer group audits were reviewed by the NRC in the initial 12 audits it conducted between September 1998 and February 1999. Specifically, in March 1999, the nuclear industry reported to the North American Reliability Council (NERC) that 65 of 66 sites had at least one industry audit (The last facility audit was completed in April 1999). Industry audits included 56 audits by utility quality assurance departments, 36 cross-utility audits, and 46 third party industry audits. Most facilities have conducted multiple audits, as shown by the total of 139 reported audits at the 66 sites. In short, all nuclear sites had received at least one independent industry audit of their Y2K program by April 1999.

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Executive Director
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reliability. Additionally, EDG reliability in emergency situations has been high, as demonstrated during weather-related power upsets. For example, following the 1992 landfall of Hurricane Andrew at the Turkey Point nuclear power plant when all offsite power was lost, EDGs operated reliably for approximately 6 days providing electrical power to plant systems until offsite power was restored. Therefore, we do not consider it necessary to impose additional EDG requirements on licensees during Y2K critical dates.

Regarding Mr. Sherman's concern about the industry's Y2K testing and emergency exercises, the Nuclear Energy Institute (NEI) and the Nuclear Utility Software Management Group (NEI/NUSMG) prepared guidelines for ensuring Y2K readiness in nuclear power plants. These guidelines, which the NRC staff found acceptable, provide direction to licensees for applying Quality Assurance (QA) measures to Y2K activities (NEI/NUSMG 97-07, Sect. 6). These measures take the form of planned periodic audits, inspections at documented hold points, and reviews of approved documents. The NEI/NUSMG guidelines state that individuals or groups not directly involved in the management of performance of Y2K project activities should oversee QA.

Y2K QA measures are an outgrowth of nuclear QA programs and processes that are in place at all nuclear reactors and that provide an independent assurance in the quality of licensee activities. Internal QA activities, external reviews and independent verification and validation all contribute to providing a high confidence in the licensee's actions to achieve Y2K readiness.

Internal QA activities consist of those activities normally performed by the licensee during plant modifications or routine maintenance activities. Licensee management reviews plant modification and maintenance activities and ensures they are conducted according to approved plant procedures and quality assurance requirements. For safety-related systems and mission-critical systems, an independent check of the plant modification or maintenance activity is conducted by another technician or engineer, depending on the activity.

External reviews of plant modifications or maintenance activities are performed by an independent group, such as the licensee's Quality Assurance Group, or a peer group from an external organization. The results and recommendations from these reviews are provided to licensee senior management as a means of improving the licensee's internal processes. For Y2K-readiness preparations, these peer group reviews were conducted by members from other licensees, industry experts, and Nuclear Energy Institute (NEI) staff. Several of these peer group audits were reviewed by the NRC in the initial 12 audits it conducted between September 1998 and February 1999 (see Enclosure 2). Specifically, in March 1999, the nuclear industry reported to the North American Electric Reliability Council (NERC) that 65 of 66 sites had at least one industry audit. (The last facility audit was completed in April 1999.) Industry audits included 56 audits by utility quality assurance departments, 36 cross-utility audits, and 46 third-party industry audits. Most facilities have conducted multiple audits, as reflected by the sum of 139 reported audits at the 66 reactor sites (which comprise all 103 operating nuclear power plants). In short, all reactor sites have received at least one independent industry audit of their Y2K program.

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The Honorable Paul D. Coverdell

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In addition, independent verification and validation (IV&V) of software modification activities for systems and components were performed using the criteria for independence required by 10 CFR Part 50 Appendix B. IV&V is part of the licensee's normal software modification and maintenance practices for safety-related and mission-critical applications. It entails a specific degree of technical, managerial, and financial independence from the development organization.

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for William D. Travers
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Typically, Y2K QA measures are an outgrowth of nuclear QA programs and processes that are required by NRC regulations to be in place at all nuclear reactors. They provide an independent assurance in the quality of programs and processes at nuclear facilities. NRC reviews, conducted at each operating reactor site, confirmed that licensees have implemented these QA measures to provide a high level of confidence in their Y2K programs. Additionally, industry reports indicate that internal and external audits have been conducted as part of the licensee's Y2K QA program.

External reviews of plant modifications or maintenance activities are performed by an independent group, such as the licensee's Quality Assurance Group, or a peer group from an external organization. The results and recommendations from these reviews are provided to licensee senior management as a means of improving the licensee's internal processes. In the case of Y2K-readiness preparations, these peer group reviews were conducted by groups consisting of members from other licensees, industry experts, and members of the NEI staff. Several of these peer group audits were reviewed by the NRC in the initial 12 audits it conducted between September 1998 and February 1999. Specifically, in March 1999, the nuclear industry reported to the North American Reliability Council (NERC) that 65 of 66 sites had at least one industry audit. This included 56 audits by utility quality assurance departments, 36 cross-utility audits, and 46 third party industry audits. The last facility audit was completed in April 1999. Most facilities have conducted multiple audits, as shown by the total of 139 reported audits at the 66 sites. In short, all nuclear sites had received at least one independent industry audit of their Y2K program by April 1999.

I hope that this information is responsive to Mr. Sherman's continuing concerns. Please do not hesitate to contact us if you have any questions regarding this matter.

Sincerely,

William D. Travers
Executive Director
for Operations

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***See previous concurrence**

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The Honorable Paul D. Coverdell- 2 -

do not consider it necessary to impose additional EDG requirements on licensees during Y2K critical dates.

I hope that this information is responsive to Mr. Shermar's continuing concerns. Please do not hesitate to contact us if you have any questions regarding this matter.

Sincerely,

William D. Travers
Executive Director
for Operations

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