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MIDDLE SOUTH UTILITIES SYSTEM

June 14, 1985

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3-A1.01.04
A4.05

Hugh L. Thompson, Jr., Director
Division of Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Waterford SES Unit 3
Docket No. 50-382
License No. NPF-38
Generic Letter 85-02

Dear Mr. Thompson:

LP&L is pleased to submit as attachments one (1) and two (2) the responses to Generic Letter 85-02. The LP&L responses have been structured to correspond to the specific NRC points of enclosures one (1) and two (2) to allow the staff to compare the Waterford 3 specific programs with the NRC recommended actions.

LP&L endorses and promotes at Waterford 3 an overall program with a goal to provide the optimum assurance of steam generator tube integrity. This goal is realized by maintaining the highest practicable standards in the many specific programs which assure steam generator tube integrity including secondary chemistry, inservice inspection, monitoring and sampling, maintenance and repair, and operations and administration. By virtue of the specific elements of these programs, as partially described in attachments one (1) and two (2), LP&L believes that the Waterford 3 overall steam generator program substantially meets or exceeds the intent of the NRC recommendations and good engineering industry practice.

Please feel free to contact me, or Robert J. Murillo, should we be able to provide any further information on this important matter.

K.W. Cook
Nuclear Support & Licensing Manager

KWC/RJM/sms

Attachments

cc: B.W. Churchill, W.M. Stevenson, R.D. Martin, D.M. Crutchfield,
J.H. Wilson, T.A. Flippo, G.W. Knighton

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ATTACHMENT ONE (1)
LP&L RESPONSES TO GENERIC LETTER 85-02
ENCLOSURE ONE (1)

1.a Prevention and Detection of Loose Parts (Inspection)

The inspection program for the steam generator secondary side is under development, and the inspection program is expected to be complete by March 1, 1986. This schedule will allow for the early planning and the effective implementation of the inspection program for the first refueling outage currently scheduled for the first quarter of 1987.

The inspection program will be a comprehensive program which will address all the inspection recommendations of enclosure one to generic letter 85-02. The frequencies for the inspections will be based upon operational experience and historical data for the Waterford 3 steam generators as well as industry experience.

The Waterford 3 steam generators have been previously visually inspected. A visual inspection was performed by Combustion Engineering on both steam generators following the Pre-Core Hot Functional Testing. This inspection included the separator deck area, upper tube bend region, and the feedring. In May of 1984, a tube sheet inspection of both steam generators was also performed utilizing a T.V. camera and associated video equipment. The blowdown lanes were also inspected at that time.

1.b Prevention and Detection of Loose Parts (Quality Assurance)

Quality assurance and quality control procedures are in place to ensure that an effective system exists to preclude introduction of foreign objects into either the primary or secondary side of the Waterford 3 steam generators. These procedures include measures for accountability and cleanliness as outlined in section 1.2 of enclosure one to generic letter 85-02.

The following procedures for example are a part of the quality assurance and quality control measures in place at Waterford 3.

UNT-7-006, Housekeeping, requires a written record be maintained for all personnel and material entering or leaving Housekeeping Zone Areas I, II, and III. The written record is the responsibility of the group performing the work. These provisions include tools, equipment, foreign objects, components, and parts.

UNT-7-005, Cleanliness Control, provides administrative controls to ensure cleanliness standards are maintained. This procedure requires inspection to be conducted immediately prior to final closure of any safety-related system which has been opened for maintenance. Cleanliness specifications are stated and inspections are documented. Inspection requirements also apply to non-safety-related systems which could have an impact on plant operations; e.g., steam generator secondary side.

PE-5-017, Steam Generator Eddy Current Inservice Testing, references UNT-7-006 and UNT-7-005 and Plant Quality procedures on cleanliness and housekeeping inspection. These procedures address the need for good housekeeping and cleanliness control to avoid any contamination.

MM-8-002, Steam Generator Primary Manway and Nozzle Dam Removal and Installation, and MM-8-004, Steam Generator Secondary Manway and Handhole Removal and Installation, refer to UNT-7-005 and UNT-7-006 and include requirements to inventory all tools and equipment, use lanyards and maintain Class "B" cleanliness (primary side) and Class "C" cleanliness (secondary side); both procedures include precautions to ensure area cleanliness is maintained; and both procedures include as acceptance criteria that the appropriate cleanliness level ("B" or "C") has been maintained.

2.a Inservice Inspection Program (Full Length Tube Inspection)

Full length tube inspections were performed during the Preservice Inspection. The inservice inspection will entail full length tube inspections from the Steam Generator hot leg side for the majority of the inspected steam generator tubes. Full length tube inspection may not be possible for a limited number of inner tubes with a small radius u-bend which will not pass a standard full sized eddy current probe. If tube degradation of the cold legs is not a problem during the inspection and the cold leg manways are not removed for other reason, such inner tubes would be inspected from the hot side. This inspection process would be consistent with the ALARA objective since the opening of the cold leg manway and the removal of the eddy current equipment would unnecessarily increase personnel exposure.

2.b Inservice Inspection Program (Inspection Interval)

The Waterford 3 eddy current inspection intervals will be consistent with Section 4.4.5.3 of the Standard Technical Specifications, and in addition, the inspection intervals are not expected to extend beyond 72 months.

3.a Secondary Water Chemistry Program

- Minimizing Steam Generator Corrosion - The Chemistry Control Program established at Waterford 3 is based on and referenced to industry standards and practices, EPRI-NP-2704-SR guidelines, and LP&L management standards and administrative controls. The goal of this program is the maintenance of the highest chemistry standards required to minimize steam generator corrosion and maximize system and plant reliability.

- Material Selection - Original and subsequent material selection and system design incorporates the aforementioned goal.

- Chemistry Limits - Listed below are the current Waterford 3 steam generator blowdown chemistry control limits established by CE-2-001 Rev. 2 and compared with EPRI recommendations in EPRI Report NP-2704-SR, October 1982:

I. Wet Layup Spec (Temp <212°F)

Parameter	W-3	EPRI
pH	9.8-10.5	9.8-10.5
N_2H_4	75-200 ppm	75-200 ppm
Cl	<0.100 ppm	None
SO_4	0.100 ppm	None
NH_3	Monitor	None
N_2	5 psig or positive flow	Slight positive pressure
Cation Cond.[a)]	None	<10.0 umho/cm
Na[b)]	None	<1.000 ppm

II. Hot Standby Spec (Temp >212°F, nonsteaming)

Parameter	W-3	EPRI
pH[c)]	8.5-9.6	8.5-9.2
Na	<0.100 ppm	<0.100 ppm
Cl	<0.100 ppm	<0.100 ppm
D.O.	<0.005 ppm	<0.005 ppm
Cation Cond.	<2.0 umho/cm	<2.0 umho/cm

III. Power Operating Specs (Temp >212°F, steaming and/or blowdown)

Parameter	W-3	EPRI
pH[c)]	8.5-9.6	8.5-9.2
Act. Level 1	<8.5, >9.6	<8.5, >9.2
Cation Cond.	0.8 umho/cm	0.8 umho/cm
Act. Level 1	>0.8 umho/cm	>0.8 umho/cm
Act. Level 2	>2.0 umho/cm	>2.0 umho/cm
Act. Level 3	>7.0 umho/cm	>7.0 umho/cm
Na	0.020 ppm	0.020 ppm
Act. Level 1	>0.020 ppm	>0.020 ppm
Act. Level 2	>0.100 ppm	>0.100 ppm
Act. Level 3	>0.500 ppm	>0.500 ppm
Cl	0.020 ppm	0.020 ppm
Act. Level 1	>0.020 ppm	>0.020 ppm
Act. Level 2	>0.100 ppm	>0.100 ppm
SO_4	0.015 ppm	None

a), b), c) see notes at end of Section IV.

Parameter	W-3	EPRI
Act. Level 1	>0.015 ppm	None
Act. Level 2	>0.100 ppm	None
Silica	0.300 ppm	0.300 ppm
Act. Level 1	>0.300 ppm	>0.300 ppm
Gross Activity	Monitor	None
Dose Eq I^{131}	0.1 uCi/GM	None

IV. Chemistry Hold Points

A. Hold Point Prior to Heatup Above 212°F

Parameter	W-3	EPRI
pH[d)]	None	8.5-9.2
Na	<0.100 ppm	<0.100 ppm
Cation Cond.	<2.0 umho/cm	<2.0 umho/cm

B. Hold Point Prior to Criticality

Parameter	W-3	EPRI
pH	8.5-9.6	None
Na	<0.100 ppm	None
D.O.	<0.010 ppm	None
Cation Cond.	<2.0 umho/cm	None

C. Hold Point Prior to Exceeding 5% Power

Parameter	W-3	EPRI
pH	8.5-9.6	None
Na	<0.100 ppm	<0.100 ppm
Cl	<0.100 ppm	<0.100 ppm
D.O.	<0.005 ppm	None
Cation Cond.	<2.0 umho/cm	<2.0 umho/cm

D. Hold Point Prior to Exceeding 25% Power

Steam generator chemistry should be within Power Operating Limits (See III).

NOTES:

a) Cation conductivity is not used as a steam generator chemistry control parameter during wet layup because a capability does not exist to provide continuous sampling flow. Sampling flow would be required to consistantly produce representative cation conductivity measurements.

(Notes continued on next page.)

NOTES (continued):

b) Sodium is measured as a diagnostic parameter instead of a control parameter during wet layup.

c) A larger pH range than the EPRI range was selected to allow additional latitude in balancing the NH_4 and N_2H_4 levels in the secondary system.

d) A pH hold point is not specified for the steam generator heatup process. Practice has been to ensure that steam generator pH is within the operating range prior to heatup.

- Control Methods

The Chemistry Control Program established at Waterford 3 is based on and referenced to industry standards and practices, EPRI guidelines, and LP&L management standards and administrative controls. The goal of this program is the maintenance of the highest Chemistry standards required to minimize steam generator corrosion and maximize system and plant reliability. Original and subsequent material selection and system design incorporates this goal.

The program is implemented through use of Waterford 3 procedures with the established hierarchy of controls. Plant Operating Manual (POM) procedures are used to implement controlling activities such as personnel training and qualification, instrumentation and equipment calibration and maintenance, periodic sampling and analysis scheduling, and chemistry maintenance and control specifications. Departmental procedures are used to implement the technical methodology to sample, analyze and use the chemistry equipment.

Sample point and continuous on-line analyzer capabilities are provided. Waterford 3 has capabilities exceeding EPRI recommendations as well as "Patch Panel" connections to cross connect sampling points to on-line instrumentation. A hotwell monitoring system is available for condenser leakage investigation and location. Each powdex condensate polisher is monitored for cation conductivity, and sodium and resin leakage detection is implemented prior to placing any vessel in service. The plant monitoring computer provides CRT displays showing system status with data from on-line chemistry monitors. A terminal is available to chemistry personnel.

Chemistry specifications are established by chemistry procedures, CE-2-XXX, (POM procedures). Setpoint alarms for chemistry instrumentation reflect these limits. Abnormal limits are correlated to Action Levels and corrective actions which are based on risk evaluations. These measures assure that abnormal chemistry parameters are returned to normal values. These limits and action requirements are imposed through POM procedures which are reviewed and approved by the Plant Operating Review Committee (PORC) and the Plant Manager. The Chemistry Engineer has the specific responsibility to implement these procedures but POM cannot be violated by any department. Operations Department procedures correlate to and reference these requirements.

All results of sampling and analysis are logged as official documentation and selected significant operational parameters are entered into Waterford 3 Chemistry Data Management (CDM) System which is an on-line computerized data management program using in house developed software on our Spectroscopy/Multi-Channel Analyzer System. A "Daily Chemistry Summary" is transmitted to all management level personnel each morning. A "Monthly Chemistry Summary" consisting of trend plots, tabulations and evaluation is prepared and distributed monthly. Any out of specification condition identified through daily analysis is reported along with recommended actions to the Shift Supervisor through use of a Chemistry Specification Deviation Notice. The action taken and reanalysis for verification for the original condition's return to specification completes the control and review cycle.

- Corrective Actions for Out of Specification Conditions

The Waterford 3 Chemistry Program incorporates progressive stringent corrective actions for out-of-specification water chemistry conditions. Waterford 3 procedure CE-2-001, Rev. 2 provides for the following Action Levels based on chemistry limits.

Action Level 1 - Return parameter to within normal specifications within one week or go to Action Level 2, if the parameter has an Action Level 2 value.

Action Level 2 - Reduce power to lowest point where automatic control can be maintained (approximately 25% power). Return parameter to within normal specifications within 100 hours or go to Action Level 3 for parameters having Action Level 3 values.

Action Level 3 - Shut down within 4 hours and feed and bleed or drain and refill as necessary to restore parameter to normal specification.

During plant startups, the Chemistry Engineer with prior approval of the Plant Manager can waive or modify the duration of the Action Levels. CE-2-001 requires formal documentation of such a waiver.

- Individual Authority

The individuals given authority to interpret chemistry information and initiate plant action are the following:

Chemistry Engineer
Radiochemistry Engineer
Chemist
Radiochemistry Supervisor
Secondary Chemistry Supervisor

3.b Condenser Inservice Inspection Program

The condition of the condenser is monitored continually via chemistry sampling in accordance with CE-2-002, Maintaining Condensate and Feedwater Chemistry, and by observing the discharge flow of the condenser air removal system. Deficiencies which indicate condenser tube leaks and sources of excessive air inleakage are reported to maintenance for corrective action.

As part of the Preventive Maintenance Program, the condenser water boxes are inspected bimonthly for any debris carried over from the traveling screens by the circulating water system. The condensers are then cleaned, as necessary.

MM-6-013, Condenser Tube Leakage Detection, provides instructions for identification and location of leak sources, methods of determining leakage cause (whether tube wall leak or rolled tubesheet joint leak) by using a helium leak detection system. MM-6-013 also provides directions for making repairs, e.g., plugging leaking tubes.

4. Primary to Secondary Leakage Limit

The Waterford 3 Technical Specification limits for primary to secondary leakage rate are 1 gpm total through both steam generators and 720 gallons per day (gpd) through any one steam generator. Because Waterford 3 is a 2 loop unit, the 720 gpd (0.5 gpm) leakage rate limit through each steam generator ensures that no more than half the 1 gpm limit occurs through any one steam generator.

5. Coolant Iodine Activity Limit

The Waterford 3 Technical Specification limits on coolant iodine activity are consistent with the Standard Technical Specifications. The CE Owner's Group has developed and submitted to NRC, criteria for reactor coolant pump trip that will ensure forced coolant flow during steam generator tube rupture events. Waterford 3 will incorporate the reactor coolant pump trip criteria into a future revision of the Operating Procedures.

6. Safety Injection Signal Reset

At Waterford 3 the safety injection pumps take suction from the refueling water storage pool and not from the boric acid storage tank. Therefore, the NRC safety injection signal reset recommended action is not applicable to Waterford 3.

ATTACHMENT TWO (2)
LP&L RESPONSE TO GENERIC LETTER 85-02
ENCLOSURE 2

1(a). Tube Degradation Failure Mechanism

Determination of the failure mechanism or cause of tubing degradation would be essential in deciding whether additional tubes should be inspected. Other considerations would be whether the C-2 inspection results were from degraded tubes or defective tubes and whether the identified failure mechanism would affect tubes which were not inspected. Tube inspections beyond Technical Specification requirements would be considered if evaluation of test results indicated that tubes not inspected were likely to suffer from the identified failure mechanism.

1(b). Inspection Of All Steam Generators

The identified failure or degradation mechanism will be evaluated for applicability to the second steam generator if only one steam generator is being inspected. An inspection of the second steam generator would be performed if the evaluation indicated a need for inspection.

1(c). Steam Generator Inspection Schedule

Consideration will be given to the tube failure or degradation mechanism, rate of degradation experienced, and evaluation of expected future degradation in determining the steam generator reinspection schedule. Input from the steam generator vendor, the SGOG, and industry operating experience will also be considered when determining the reinspection schedule.

2. Degradation Mechanism

The degradation mechanism and the experienced or expected rate of degradation are the prime factors which will be considered in determining the ability of the steam generator to perform as designed under all operating conditions. Sufficient inspection and evaluation would be performed to ensure steam generator integrity until the next scheduled inspection.