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MIDDLE SOUTH UTILITIES SYSTEM

January 26, 1984

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3-A1.01.04
3-A19.09.10

Director of Nuclear Reactor Regulation
Attention: Mr. G. W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Waterford 3 SES
Docket No. 50-382
Leak Reduction Program

Dear Sir:

As specified in the Waterford 3 SER and in accordance with NUREG-0737 item III.D.1.1, LP&L has committed to developing procedures and a scheduled maintenance program to monitor leakage and to reduce detected leakage to as low as practical levels for systems outside the containment which could contain radioactivity. A description of the various actions and procedural requirements used to implement this commitment is attached. We request that the NRC review the attached and provide a supplement to the SER.

If you have any questions regarding this matter, please feel free to contact myself or Bob Foley at (504)363-8937.

Very truly yours,

K W Cook

K. W. Cook
Nuclear Support & Licensing Manager

KWC/RMF/cb

Attachment

cc: E. L. Blake, W. M. Stevenson, J. Wilson, G. L. Constable, J. Hayes

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DESCRIPTION OF
WATERFORD 3 LEAK REDUCTION PROGRAM

LP&L has instituted a program to maintain leakage rates of systems outside containment which could contain radioactivity to as low as practical. To support this program, a review of plant systems has identified the systems outside containment which could potentially contain highly radioactive fluids following a serious accident.

A. Systems to be included in the leak reduction program:

1) Containment Spray System - that portion of the system located outside containment that would be in use in the recirculation mode of operation including that suction piping from the Safety Injection Sump up through the pumps and heat exchangers to the containment isolation valve.

2) Low Pressure Safety Injection - the piping outside of containment in use during operation in the shutdown cooling mode.

3) High Pressure Safety Injection - the piping from the recirculation suction header through the pump up to containment.

4) Hydrogen Analyzer System - that portion of piping from the outside containment isolation valve to the Hydrogen Analyzer Panels, along with the piping to the containment atmospheric grab sampler in the Post Accident sampling area and return piping back to the containment isolation valve.

5) Post Accident Sampling System (PASS)- For the liquid portion of the system, testing includes the piping from the SI sump suction header through the sample pump to the PASS skid packages back to the outside containment isolation valve. Also included is the piping from the RCS Hot Leg Sample outside containment isolation valve to the PASS skid package and back to the containment isolation valve. For the gas portion of the system, also included is that portion of the tubing from the liquid/gas separator through the skid package back to the outside containment isolation valve.

B. Systems excluded from the program (their isolation will not preclude any option of cooling the reactor core nor prevent the use of needed safety systems.)

1) The Gaseous Waste Management System. This system isolates on CIAS and is not required for use post-accident. The Reactor Coolant Vent System provides RCS venting as discussed in FSAR Section 1.9.18.

2) The Chemical Volume and Control System (Charging and Letdown). On a CIAS or SIAS this system will isolate letdown flow which is not

required after an accident nor is it needed to bring the reactor to a safe shutdown condition. In addition to letdown being isolated on an SIAS, the Volume Control Tank (VCT) outlet valve closes resulting in the charging pumps taking suction directly from the Boric Acid Makeup Tanks, or the charging pumps can be lined up to the refueling water storage pool (RWSP). Thus, no highly radioactive fluids are expected to flow through the portion of the CVCS outside of containment.

3) Reactor Coolant Pump Seal Bleed-off to the VCT. This system is isolated on a CIAS. If seal bleed-off is needed post accident the pressure in that portion of the system inside containment will increase and the header relief valve will open thus providing a flow path to the Quench Tank.

4) The Boron Management System. This system receives a CIAS which isolates the Reactor Drain Tank outlet, thus, when the tank is pressurized it relieves to the containment sump.

5) The Primary Sampling System. This system isolates on a CIAS and would not be required because of the availability of the Post Accident Sampling System.

6) The Shield Building Ventilation System. That portion of the system from the annulus through the filters and up to the fan is operated at a negative pressure. So, any leakage would be in the inward direction and not outward from the system. System leakage downstream of the fan is of no radiological significance since the SBVS filter exhaust is suitable for discharge to the atmosphere.

C. For liquid systems, leakage detection will be performed by visual inspection of all potential leak sources (e.g., valves, pump seals, etc.). Upon detection of a leak, the leak rate will be determined. For gas systems, leakage detection will be performed by pressurizing the system with an inert gas or nitrogen, and visually inspecting potential leak sources with a soapy water solution (or equivalent method). Those leakage sources whose leak rates cannot be reduced to as low as practical, will be reported to the Plant Manager or his designee for resolution. Initial leakage rates will be determined during plant startup testing prior to initial criticality and reported to the NRC. Future leak rate measurements will be performed at intervals not to exceed each refueling outage. Records of leakage rates and their sources will be retained in plant files.

D. The potential release path identified in the NRC letter dated October 17, 1979 (Radioactive Release at North Anna Unit 1 and Lessons Learned) is not credible in the Waterford 3 design. High level in the volume control tank is alarmed in the main control room and automatically causes influent flow to be diverted to the Boron Management System. The overall program for prevention of unplanned radioactivity releases will incorporate the features of IE Circular 79-21. Aspects of the program and related features of the Waterford 3 design are:

1) All tanks outside of containment are provided with level indicators and high level alarms to alert the operator of high level conditions, and loop seals on overflow lines to prevent the escape of radioactive gas. Generally, collection tanks and tanks which receive processed waste are provided with backup tanks. Tanks outside of containment which are not provided with a backup tank are:

   - Primary Water Storage Tank (PWST) - The PWST is located outside the nuclear plant island and as such, the Technical Specifications place a strict limit on the amount of activity allowed in the tank. Therefore, a spill from the tank would not involve a significant amount of radioactivity.

   - Equipment Drain Tank (EDT) - The EDT does not have an overflow and thus there is no potential for spillage. In the event of high level, the EDT pump starts and pumps to the Holdup Tanks via the Flash Tank.

   - Spent Resin Tank (SRT) - High level in the SRT automatically causes the inlet valve to close. The SRT is vented to the vent gas collection header.

   - Concentrate Storage Tank - Overflow from this tank is to the floor of its cubicle, which is provided with six inch curbs to limit the spread of liquid.

2) Storm drains are located away from areas with a high potential for radioactive spills and there are no cross-connects between the floor and storm drainage systems.

3) Radioactive pumps are generally located in isolated compartments whose drains are designed to catch all potential leakage. These drains are routed through the radioactive drainage systems to the waste management system. Pumps whose potential for radioactive leakage is greatest are equipped with drip pans and lines piped to the floor drains. Discussion of the Equipment Drain System can be found in FSAR Subsection 9.3.3.

4) Cubicles where the potential for liquid leakage exists are generally provided with floor drains and/or equipment drains. Areas where flooding could be expected to cause a safety problem are provided with watertight doors.

The Waterford 3 Leak Reduction procedure addresses (1) performance of inspections to verify integrity of systems that could cause an inadvertent release, and (2) implementation of a preventive maintenance program to promptly repair identified problems, such as leaking equipment and plugged floor drains.

Underground piping will be hydrostatically tested as required by ASME Section XI or other regulatory requirements. New permanent piping systems will by hydrostatically tested prior to first use in accordance with ASME

Section XI or other applicable regulatory requirements. All temporary piping associated with vendor solidification equipment is hydrostatically tested by the vendor prior to shipment and installation in accordance with their QA procedures.