Alabama Power Company
600 North 18th Street
Post Office Box 2641
Birmingham, Alabama 35291
Telephone 205 250-1000

F. L. CLAYTON, JR.
Senior Vice President

Alabama Power
the southern electric system

81 JAN 16 P5:1

January 15, 1981

Docket No. 50-348
No. 50-364

RECEIVED
JAN 23 1981
U.S. NUCLEAR REGULATORY COMMISSION

Mr. James P. O'Reilly
U. S. Nuclear Regulatory Commission
Region II
Suite 3100
101 Marietta Street, N.W.
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

As requested by I.E. Bulletin 80-24, "Prevention of Damage Due to Water Leakage Inside Containment (October 17, 1980 Indian Point 2 Event)," dated November 21, 1980, Alabama Power Company submits the enclosed response for Units 1 and 2 of the Farley Nuclear Plant. Also enclosed are piping and instrumentation drawings of the Units 1 and 2 service water system.

If you have any questions, please advise.

Yours very truly,

F. L. Clayton, Jr.

RWS:de

Enclosures

cc: Mr. R. A. Thomas
Mr. G. F. Trowbridge
Mr. L. L. Kintner (w/enclosures)
Mr. E. A. Reeves (w/enclosures)
Mr. W. H. Bradford (w/enclosures)
Office of I&E (w/enclosures)
Division of Reactor Oper. Insp.
Washington, D.C.
Office of I&E (w/enclosures)
Div. of Const. Insp.
Washington, D.C.
Mr. M. D. Hunt (w/enclosures)
I&E, Region II

SWORN TO AND SUBSCRIBED BEFORE ME THIS 15 DAY OF JAN, 1981.

Notary Public

My Commission expires:
5-22-82

8101290334 Q

Enclosure

Item 1

Provide a summary description of all open cooling water systems present inside containment. Your description of the cooling water systems must include: (a) Mode of operation during routine reactor operation and in response to a LOCA; (b) Source of water and typical chemical content of water; (c) Materials used in piping and coolers; (d) Experience with system leakage; (e) History and type of repairs to coolers and piping systems (i.e., replacement, weld, braze, etc.); (f) Provisions for isolating portions of the system inside containment in the event of leakage including vulnerability of those isolation provisions to single failure; (g) Provisions for testing isolation valves in accordance with Appendix J to 10 CFR 50 (h) Instrumentation (pressure, dew point, flow, radiation detection, etc.) and procedures in place to detect leakage; and (i) Provisions to detect radioactive contamination in service water discharge from containment.

Response

The service water system is an "open" system which supplies cooling water to components located inside Farley Nuclear Plant containments. Specific details requested are contained in the following sections.

A. Mode of Operation

1) Normal operation: The service water system supplies water to the reactor coolant pump motor air coolers and to the containment fan cooling units.

2) LOCA operation: The service water system supplies water to the four containment fan cooling units. The service water flow rate is increased when the units are functioning under LOCA conditions.

B. Source of Water and Chemical Content

The service water system's water supply is the Farley Nuclear Plant service water storage pond. The Farley Nuclear Plant service water storage pond receives its water supply primarily from the Chattahoochee River via the river water system and from rain water run-off.

The following is the typical chemical content present in service water.

Cations:	PPM
Sodium (Na)	3.6
Potassium (K)	1.
Ammonia (NH_4)	*ND (0.2)

Anions:	PPM
Bicarbonate Alkalinity (HCO_3)	22.
Carbonate Alkalinity (CO_3)	*ND (2.)
Hydroxide Alkalinity (OH)	*ND (2.)
Fluoride (F) - Free and Combined	0.10
Chloride (Cl)	4.
Sulfide (H_2S)	0.1
Sulfate (SO_4)	3.
Nitrate (NO_3)	2.
Phosphorus (PO_4) - Total Ortho and Polyphosphate	0.8
Phosphorus (PO_4) - Sol. Orthophosphate	*ND (0.1)
Silica (SiO_2) - Soluble	6.8
Silica (SiO_2) - Total	10.

Others:	PPM
PH (PH Units)	7.5
Alkalinity ($CaCO_3$) - Total	18.
Alkalinity ($CaCO_3$) - Phenolphthalein	*ND (2.)
Conductivity (Micromhos Per CM)	58.
Total Suspended Solids at 105 C	14.
Aluminum (Al) - Soluble and Insoluble	1.5
Calcium (Ca) - Soluble and Insoluble	5.6
Iron (Fe) - Soluble and Insoluble	1.1
Magnesium (Mg) - Soluble and Insoluble	1.1
Manganese (Mn) - Soluble and Insoluble	0.11
Chemical Oxygen Demand (O_2)	9.
Total Organic Carbon (C)	9.

*Not detected (below indicated limit of detection)

C. Materials Used in Piping and Coolers

The containment fan cooling units are water-air coil type coolers. The frames are galvanized steel, the coils are carbon steel, the fins are copper, and the tubing and headers are cupro-nickel.

The RCP motor air coolers are water-air type coolers. The cooler tubes are copper, and the frame and other parts are stainless steel. All of the service water piping is carbon steel.

D. Experience with System Leakage

Service Water in the containment has exhibited no leakage from piping or system components.

E. History and Type of Repairs

No repairs have been made to the Service Water System inside containment other than routine packing adjustments.

F. Provisions for Isolating Leaks Considering Single Failure Vulnerability

Motor operated valves QV010A, B, C and D, and motor operated valves QV207A, B, C and D can be used to isolate the water supply to any of the four containment fan cooling units. If the MOV's fail to operate or if leakage persists, manual valves QV009A or B and motor operated valves QV043A, B, C and D and QV044A, B, C and D are available to isolate a leaking cooler. Train isolation (two coolers) would be required in this case.

In the event of a reactor coolant pump motor air cooler leak, motor operated valves QV071 and QV081 are available to isolate flow to all motor air coolers. In the event that these valves fail to operate or if leakage persists, manual valve QV009B and motor operated valve QV072 can be utilized for isolation.

G. Testing Per Appendix J to 10 CFR 50

Containment Cooler Isolation Valves QV010A, QV010B, QV010C, QV010D, QV043A, QV043B, QV043C, QV043D, QV207A, QV207B and QV207D are included in the Farley Nuclear Plant Inservice Testing Program and are tested quarterly as required by Technical Specification paragraph 4.0.5. The requirements of 10 CFR 50 App. J are not applicable to these 12 valves.

RCP Motor Air Cooler Isolation Valves QV071, QV072 and QV081 are included in the Farley Nuclear Plant Inservice Testing Program and are tested as required by technical specification paragraph 4.0.5. A "Type C" Local Leak Rate Test is periodically performed on these three valves in accordance with 10 CFR 50 appendix J.

H. Instrumentation

The instrumentation for the containment fan cooling units and the reactor coolant pump motor air coolers is shown in service water P&ID (D-175003, Sheets 1 and 2, and D-205003, Sheets 1 and 2). Flow elements 3013A and 3014A are installed in the common S.W. inlet HBC-29 and outlet HBC-39 lines of containment coolers 1A and 1B. Flow elements 3013B and 3014B are installed in the common S.W. inlet HBC-29 and outlet HBC-39 lines of containment coolers 1C and 1D. Flow indicators 3013A, 3014A, 3013B, and 3014B are located on the main control board.

To indicate a possible containment cooler service water leak, an orifice with high flow differential alarm FDAH 3013 is installed across the common inlet and outlets of containment coolers 1A, 1B, 1C and 1D. A high differential flow alarm is indicated on the MCB panel.

The common inlet of coolers 1C and 1D also provides cooling water for the RCP motor air coolers and the motor control center coolers (1B, 2B). The return lines for this equipment discharges onto the common outlet of the containment coolers 1C and 1D. Since the high flow differential alarm is installed across the common inlet and outlet, a leak in reactor coolant pump motor coolers and the motor control center coolers (1B and 2B) will activate the alarm as well as a containment cooler leak.

Pressure indicators PI 3012A and PI 3012B, which are mounted on the respective common service water inlets of the containment coolers, provide local indication of cooling water inlet pressure.

Pressure indicators PI 3021A, PI 3021B, PI 3021C and PI 3021D, which are mounted on the respective outlet lines from the four containment coolers, provide local pressure indication of the cooling water outlets.

Temperature indicators TI 3025A, TI 3025B, TI 3025C and TI 3025D provide remote (MCB) temperature indications of the cooling water outlets from the respective four containment coolers.

The above indicators are used to obtain the desired operation of motor regulating valves QV010A, QV207A, QV043A, QV044A, QV044B, QV010B, QV207B, QV043B, QV010C, QV207C, QV043C, QV044C, QV010D, QV207D, QV043D, and QV044D respective to the four containment coolers.

Temperature indicator TI 3398 , located outside containment in common discharge line of cooling water from RCP motor coolers, provides Main Control Board indication of the cooling water outlet temperature.

Procedures

Annunciator response procedures are provided for each annunciated condition described above. These procedures indicate the origin of the alarm and any automatic action which has been initiated. They also prescribe specific immediate operator action and subsequent operator action to be performed in responding to the condition precipitating the alarm. Where appropriate, annunciator response procedures reference Emergency Operating Procedures, Abnormal Operating Procedures, System Operating Procedures, etc.

I. Provisions to Detect Radioactive Contamination in Service Water Discharge

Leakage of radioactive materials to the environment is minimized by maintaining system pressure above that of the medium being cooled where possible.

A radiation element (RE 0020A, RE 0020B) installed in a 2" line around the manual valve of the common outlets of the respective pairs of containment coolers, is designed to detect the presence of radioactive materials that may accidentally enter the cooling water system through

tube leaks in the coolers. Monitors R1SH 0020A and R1SH 0020B provide an alarm in the control room. These monitors provide two alarms:

Downscale (instrument failure)

Upscale at a given radiation level

Annunciator Response Procedures contain provisions for appropriate operator actions.

ITEM 2

For plants with open cooling water systems inside containment, take the following actions:

a. Verify existence or provide redundant means of detecting and promptly alerting control room operators of a significant accumulation of water in containment (including the reactor vessel pit if present).

Response

Farley Nuclear Plant's present containment cavity sump water level instrumentation indicates level by high alarm only. To implement NUREG 0578, TMI Lessons Learned requirements, Alabama Power Company is installing redundant safety grade main control room indication for the containment sump. Containment sump level recording capability is also being installed. Unit 1 instrumentation installation is planned to be completed prior to return to power from the current refueling outage but no later than January 1, 1982, and Unit 2 instrumentation installation is planned to be completed by March 10, 1981, or no later than prior to exceeding 5% power.

As mentioned, a large service water leak in the containment coolers will be indicated by the high flow differential alarm which is installed across the common inlets and outlets of the containment coolers 1A and 1B of Train A, and 1C and 1D of Train B. The alarm of Train B (indicated on the MCB panel) will also detect any leak in the RCP motor air coolers as well as MCC cooler 1B (2B).

Another means of leak detection is the condensate measuring system designed to permit measurement of the flow rate of liquid run-off from the drain pans under each containment fan cooling unit. An increased run-off of sufficient magnitude will cause a measureable head to develop in the standpipe and will activate the hi and/or hi-hi level alarm. Readout of the standpipe level indication is located in the main control room. The condensate measuring system also provides a means of estimating the amount of water leaking into the pan from the coolers by measuring standpipe volume change (proportional to level change) during a measured time interval.

b. Verify existence or provide positive means for control room operators to determine flow from containment sump(s) used to collect and remove water from containment.

Response

Since any leak in the containment coolers and the RCP motor air coolers will accumulate in the containment sump, the sump level alarm system can be used as a means of leak detection (see response 2.a).

No containment sump flow indication as such is provided in either Unit 1 or 2; however, redundant sump level indication is being installed. In addition, an electrical alternator will replace the mechanical alternator for both Units 1 and 2 sump pumps as well as the level controller so as to improve pump starting reliability.

c. Verify or establish at least monthly surveillance procedures, with appropriate operating limitations, to assure plant operators have at least two methods of determining water level in each location where water may accumulate. The surveillance procedures shall assure that at least one method to remove water from each such location is available during power operation. In the event either the detection or removal systems become inoperable, it is recommended that continued power operation be limited to seven days and added surveillance measures be instituted.

Response

Farley Nuclear Plant Unit 2 draft full power technical specifications contain specifications for the containment cavity sump water level instrumentation. This specification requires monthly channel checks.

Alabama Power Company intends to upgrade Farley Nuclear Plant Unit 1 technical specifications subsequent to the issuance of the Farley Nuclear Plant Unit 2 full power operating license. Containment sump level instrumentation will be included at this time.

d. Review leakage detection systems and procedures and provide or verify ability to promptly detect water leakage in containment, and to isolate the leaking components or system. Periodic containment entry to inspect for leakage should be considered.

Response

See response to items 2a, b anc c. No containmen: entry is required unless installed instrumentation indicates a leakage problem.

e. Beginning within 10 days of the date of this bulletin, whenever the reactor is operating and until the measures described in (a) through (d) above are implemented, conduct interim surveillance measures. The measures shall include where practical (considering containment atmosphere and ALARA considerations) a periodic containment inspection or remote visual surveillance to check for water leakage. If containment entry is impractical during operation, perform a containment inspection for water leakage at the first plant shutdown for any reason subsequent to receipt of this bulletin.

Response

During the present Unit 1 refueling outage, the containment was inspected for evidence of water leakage and no evidence was found. Unit 2 has not been placed into operation at this time. Alabama Power Company considers item 2.a through 2.b fully satisfied at this time; therefore, interim surveillance is not required.

f. Establish procedures to notify the NRC of any service water system leaks within containment via a special license event report (24 hours with written report in 14 days) as a degradation of a containment boundary.

Response

Service water system design pressure exceeds containment post LOCA pressure; therefore, no leakage path for airborne radioactivity exists which would degrade the containment boundary. It is, therefore, Alabama Power Company's position that the reporting of service water system leakage is not justified.

ITEM 3

For plants with closed cooling water systems inside containment, provide a summary of experiences with cooling water system leakage into containment.

Response

No leakage, other than minor packing leaks, has occurred from the component cooling water, demineralized water, or the reactor makeup water systems inside containment. If leakage from these systems was to occur, the containment sump level instrumentation previously discussed would provide adequate indication of such leakage.