

DUKE POWER COMPANY

POWER BUILDING

422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242
JUL 12 1981 50WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

July 9, 1981

TELEPHONE: AREA 704
373-4083

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

Re: RII:JPO
Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
S. E. Bulletin 81-03



Dear Mr. O'Reilly:

Duke Power Company's initial response to S. E. Bulletin 81-03, submitted to your office by Mr. A. C. Thies's letter of May 22, 1981, inadvertently did not address the fire protection system at the Keowee Hydro Station. However, on May 26, 1981, during a fire hydrant test at the Keowee Hydro Station, Asiatic clams were discovered in the fire protection system.

Please find attached Revision 1 of Duke Power Company's response to the subject bulletin.

I declare under penalty of perjury that the statements set forth herein are true and correct to the best of my knowledge, executed on July 9, 1981.

Very truly yours,

William O. Parker, Jr.

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Attachment

cc: Director
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

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DUKE POWER COMPANY
OCONEE NUCLEAR STATION

Response to IE Bulletin 81-03

Revision 1

For the past three years, the Oconee Nuclear Station (ONS) Environmental Monitoring Program has conducted a physical search of selected portions of Lake Keowee to determine the presence of Asiatic clams. Clams, Corbicula sp., were detected for the first time in September 1980 in the ONS intake canal, during the last survey performed at Lake Keowee.

Visual Examination of Potentially Affected Systems

Amertap System: Amertap balls are collected and counted on a weekly basis. During the December 22, 1980 inspection on Unit 1, a small number of clam shells were found in the collection baskets. No clams have been found in the Amertap system in other inspections, and the December 22 discovery is the only occasion in which clams have been found anywhere in the station.

Condenser Cooling Water (CCW) System: The condenser waterboxes were inspected for Unit 2 in November 1980 and Unit 3 in January 1981. No clams were found in the waterboxes. Subsequent inspections of the CCW pump wells on May 1, 1981, showed clams present at the intake structure.

High Pressure Service Water (HPSW) Pump Motor Cooler: The cooler was opened for maintenance in August 1980. No clams were found.

Recirculated Cooling Water (RCW) Heat Exchangers: The RCW Heat Exchangers were opened and cleaned during the Unit 1, Cycle 6 refueling outage (first quarter of 1980). No clams were found.

Fire Protection System at Keowee Hydro Station: On May 26, 1981, during a fire hydrant test at Keowee, clams were discovered in the fire protection system.

Flow Tests of Potentially Affected Systems

Fire Hose Stations: During 1980 and early 1981, all fire hose stations were tested for valve operation and flow. During the test, all stations were flushed thoroughly. No clams were found and no evidence of flow restrictions were noted.

Low Pressure Service Water (LPSW) Pumps: Performance flow tests of the LPSW System through the Low Pressure Injection (LPI) and Decay Heat Coolers are conducted monthly. Also, flow through each of the Reactor Building Cooling Units is monitored continuously by the plant computer, which provides an alarm if low flow is detected. No deviations from normal flow have been noted in either case.

HPSW Pumps: Performance tests are conducted monthly to ensure power supply and adequate flow to the HPSW pumps. No evidence of flow restrictions have been recorded.

Potential for Clam Intrusion

The Oconee systems which use raw water from Lake Keowee, and therefore are most susceptible to Asiatic clam intrusion, are the Condenser Circulating Water (CCW) system, the Low Pressure Service Water (LPSW) system, and the High Pressure Service Water (HPSW) system.

The CCW system provides cooling and service water to all three units through twelve 177,000 gpm CCW pumps. Each unit is furnished with four pumps and a single 186-inch diameter pipe for supplying condenser cooling water. The potential for intrusion of clams into the CCW intake structure and pipes during low water level of Lake Keowee is no worse than during normal water level. Full pond level is 35.5 feet above the CCW pump suction inlet and, even with maximum lake draw down, a minimum level of 10.5 feet of water remains above the pump suction. Furthermore, a 3.5 feet clearance exists between the floor of the intake structure bay and the pump suction. Therefore, a sufficient volume of water is provided during low lake level to include a significant increase in the velocity of inlet water to the pump suction.

The LPSW and HPSW systems receive their make-up water from the top of the 42-inch CCW crossover line. The CCW crossover line is connected, in turn, to the top of each unit's 186-inch CCW supply line. A difference in elevation of 24.5 feet exists between the bottom of the main CCW supply line and the suctions of the service water pumps. Therefore, the possibility of introducing adult clams into the service water systems is considered to be extremely remote.

Asiatic Clam Control Methods

Duke Power Company has had more than 10 years experience dealing with fouling caused by Asiatic clams at its generating facilities. The Asiatic clam has been present in the Duke service area since the mid 1960s. It became a nuisance at one of the fossil fueled plants in 1970 and a program of remedial actions was initiated to minimize the effects of the clams. As the clams extended their range throughout the Duke system, an ad hoc committee was formed in 1978 to deal with clam related problems at all Duke generating facilities. The committee is reviewing each plant to determine, in general, how best to protect raw water systems from fouling by clams. If the clams become a nuisance at a plant, specific changes involving piping modification, maintenance procedures, and/or biocide application are developed on a case by case basis.

Through this ad hoc committee, Duke is assessing various control methods for use at Oconee and Keowee should the clams become a problem. The methods currently under review include continuous or periodic chlorination of systems; installation of strainers at the inlet of components or systems; replacement of existing strainers with smaller mesh straining elements; periodic flushing of potentially affected lines; and, installation of flow and/or pressure measuring devices on various components and lines to assure adequate flow. | 1

Past experience at Oconee has not shown the presence of clams in Lake Keowee to be an impending problem. As discussed earlier, evidence of clams has not been detected in any Oconee systems except for the Amertap system, and no evidence of clam fouling has been detected whatsoever. As a precaution, however, maintenance procedures and performance criteria are currently being reviewed and evaluated for inclusion in a formal monitoring program to provide early detection of clam infestation of service water systems. Detection of clams may consist of differential pressure readings across an equipment item, examination of strainers and drainage discharge lines, and visual inspection of inlet heat exchanger heads and piping supply lines. Supply and discharge line flow rates to a piece of equipment may also be monitored. The criteria for the acceptable, minimum flow rate in a specific line are currently being evaluated. Flow monitoring will consist of either existing flow meters or manually operated, sonic flow meters.

Duke expects to have this monitoring program developed and implemented by October 1, 1981. The results of this program will then be used to help Duke determine the need for each of the control methods currently under review and the schedule by which these methods should be implemented. The actions required to insure adequate component flow rates will be accomplished by August 15, 1981 on the Keowee Hydro Station fire protection system. | 1