UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
230 PEACHTREE STREET, N.W. SUITE 1217
ATLANTA, GEORGIA 30303

JUL 10 1978

In Reply Refer To:
RII:JPO
50-369, 50-370
50-269, 50-270
50-287

Duke Power Company
Attn: Mr. William O. Parker, Jr.
Vice President, Steam Production
P. O. Box 2178
422 South Church Street
Charlotte, North Carolina 28242

Gentlemen:

Enclosed Circular 78-13 is forwarded to you for information. If there are any questions related to your understanding of the suggested actions, please contact this office.

Sincerely,

Dudley Thompson
Deputy Director

Enclosure:
IE Circular 78-13

cc w/encl:
J. C. Rogers, Project Manager
McGuire Nuclear Station
P. O. Box 2178
Charlotte, North Carolina 28242

M. D. McIntosh, Plant Manager
McGuire Nuclear Station
P. O. Box 488
Cornelius, North Carolina 28031

J. E. Smith, Station Manager
Oconee Nuclear Station
P. O. Box 1175
Seneca, South Carolina 29678

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

July 10, 1978

IE Circular No. 78-13

OPERABILITY OF SERVICE WATER PUMPS

Description of Circumstances:

On January 11, 1978, Salem Generating Station Unit No. 1, a 4-loop Westinghouse PWR with once-through cooling located on the Delaware River, experienced high strainer differential pressures and the loss of four of six installed service water pumps within a period of approximately thirty minutes. At the time of this occurrence, the river surface was covered with a layer of frazil (slush) ice to an unknown depth.

Each service water pump discharge is equipped with an R. P. Adams VDWS-68 automatic self-cleaning strainer. The indication of failure was high strainer differential pressure. Subsequent investigation showed that each of the four strainers had broken shear pins in the backwash shaft which caused the self-cleaning feature to become inoperable. The internals of the strainers revealed no unusual debris which could have caused differential pressures high enough to shear the pins.

Each service water pump takes suction near the bottom of individual bays in the intake structure. Examination of the bays revealed that silt had accumulated to significant heights between the traveling screen and pump suction in each of the bays associated with failed strainers. The combined effects of high silt "walls," low river water level, and the surface ice, probably caused the pump suction to receive only ice-entrained water. This mixture then caused the strainers to clog and shear the backwash shear pins due to the high differential pressures. By the time the strainers were opened for inspection, the ice had melted.

The safety significance of this event stems from the potential, under a unique set of environmental circumstances, for a complete loss of service water.



dup

Accw: 7911120557

Corrective actions included the establishment of a periodic surveillance program to ensure that silt levels in the service water bays do not reach a level sufficiently high to cause recurrence of this event.

Holders of operating licenses or construction permits for power reactors who receive this Circular should review the service water design and postulated conditions in the ultimate heat sink to ensure that a similar combination of surface ice, water level, and forebay silting could not precipitate inoperability of the service water system. If such conditions are credible, a program to monitor the conditions at the service water intake structure should be implemented and procedures established for corrective action to be taken under normal and emergency conditions.

No written response to this Circular is required. If you require additional information regarding this matter, contact the Director of the appropriate NRC Regional Office.

IE Circular No. 78-13
July 10, 1978

LISTING OF IE CIRCULARS ISSUED IN 1978

| Circular No. | Subject | Date of Issue | Issued To |
|---|---|---|---|
| 78-01 | Loss of Well Logging Source | 4/5/78 | All Holders of Well Logging Source Licenses |
| 78-02 | Proper Lubricating Oil for Terry Turbines | 4/20/78 | All Holders of Reactor OLs or CPs |
| 78-03 | Packaging Greater Than Type A Quantities of Low Specific Activity Radioactive Material for Transport | 5/12/78 | All Holders of Reactor OLs, CPs, Fuel Cycle, Priority I Material and Waste Disposal Licenses |
| 78-04 | Installation Error That Could Prevent Closing of Fire Doors | 5/15/78 | All Holders of Reactor OLs or CPs |
| 78-05 | Inadvertent Safety Injection During Cooldown | 5/23/78 | All Holders of Reactor OLs or CPs |
| 78-06 | Potential Common Mode Flooding of ECCS Equipment Rooms at BWR Facilities | 5/23/78 | All Holders of Reactor OLs or CPs |
| 78-07 | Damaged Components of a Bergen-Paterson Series 25000 Hydraulic Test Stand | 5/31/78 | All Holders of Reactor OLs or CPs |
| 78-08 | Environmental Qualification of Safety Related Equipment at Nuclear Power Plants | 5/31/78 | All Holders of Reactor OLs or CPs |
| 78-09 | Arcing of General Electric Company Size 2 Contactors | 6/5/78 | All Holders of CPs |

IE Circular No. 78-13
July 10, 1978

LISTING OF IE CIRCULARS ISSUED IN 1978

| Circular No. | Subject | Date of Issue | Issued to |
|---|---|---|---|
| 78-10 | Control of Sealed Sources Used in Radiation Therapy | 6/14/78 | All Medical Licensees in Categories G and G1 |
| 78-11 | Recirculation M-G Set Overspeed Stops | 6/15/78 | All Holders of BWR OLs or CPs |
| 78-12 | HPCI Turbine Control Value Lift Rod Bending | 6/30/78 | All Holders of BWR OL's or CPs except as listed in Encl. 2 |