Docket

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

January 11, 1990

Docket Nos. 50-327
and 50-328

Mr. Oliver D. Kingsley, Jr.
Senior Vice President, Nuclear Power
Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Mr. Kingsley:

SUBJECT: BULLETIN NO. 89-02, STRESS CORROSION CRACKING OF HIGH-HARDNESS BOLTING IN ANCHOR DARLING SWING CHECK VALVES (MPA X9-002) (TAC NOS. 74311/74312) - SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

On July 19, 1989, the NRC staff issued Bulletin 89-02, "Stress Corrosion Cracking of High-Hardness Type 410 Stainless Steel Internal Preloaded Bolting in Anchor Darling Model S350W Swing Check Valves or Valves of Similar Design." The purpose of the bulletin is to request licensees of nuclear power reactors to identify, disassemble, and inspect certain types of swing check valves which may contain Type 410 stainless steel (SS) bolting material. If the Type 410 SS bolting material is of sufficiently high hardness that it is susceptible to stress corrosion cracking (SCC), or has failed, licensees were requested to take appropriate actions. The bulletin requested the licensees to do the following:

1. Disassemble and inspect all safety-related Anchor Darling Model S350W swing check valves, and valves of similar design, supplied with internal retaining block studs of the American Society of Testing Material (ASTM) Specification A193 Grade B6 Type 410 SS;

2. If any of the internal bolting is to be reused, it should be inspected for cracks, the cracked bolting should be replaced, and a failure analysis performed for the cracks;

3. If all the suspect bolting is to be replaced with bolting of material and hardness specified in the bulletin, surface inspection and failure analysis of the old bolting is not needed unless an expected failure mechanism is evident; and

4. Reused and new bolting should have a maximum Rockwell hardness of Rc26.

The inspections were to be performed at (1) the next refueling outage or the first scheduled outage of sufficient duration (i.e., at least four weeks) that begins 90 days after receipt of the bulletin for the Anchor Darling valves and (2) the next refueling outage that begins 180 days after receipt of the bulletin for similar swing check valves.

DF01
1/0

By letters dated June 13 and December 7, 1990, you responded to the bulletin for Units 1 and 2, respectively. You stated that twelve valves on each unit were identified: ten are Anchor Darling Model S350W swing check valves located in the safety injection system and two are Crane-Alloyco Model 8C54 swing check valves located in the Residual Heat Removal System. The specific valves and their location are given in enclosures to these two letters.

In the letter dated June 13, 1990, you stated the Unit 1 valves were disassembled and visually examined during the Unit 1 Cycle 4 refueling outage in the spring of 1990. This was the first outage of sufficient duration since the bulletin for Unit 1. No broken studs or bolts were found and a visual examination revealed no linear indications. The internal bolting material for the Unit 1 Anchor Darling valves was replaced with ASTM Specification A564-630-1150 stud material. The stud material for the Unit 1 Crane-Alloyco valves was replaced with ASME SA193 Grade B6 having a correlated Rockwell Hardness below the maximum hardness value given in the bulletin.

In the letter dated December 7, 1990, you reported that the Unit 2 valves were disassembled and visually examined during the Unit 2 Cycle 4 refueling outage. This is the first outage of sufficient duration since the bulletin for Unit 2. Visual examination revealed that one Anchor Darling valve had a broken retaining block stud. One Crane-Alloyco valve experienced stud failure during removal of the stud. No broken studs or bolts were encountered on the remaining Unit 2 valves. It was reported in the phone call on January 2, 1991, with the Sequoyah licensing staff that a visual examination revealed no linear indications on the studs and bolts. The internal bolting material for the ten Unit 2 Anchor Darling valves was replaced with ASTM Specification A564-630-1150 stud material. The stud material for the two Unit 2 Crane-Alloyco valves was also replaced with ASME SA193 Grade B6 having a correlated Rockwell hardness below the maximum value given in the bulletin.

To provide programmatic control on the ten Anchor Darling valves in each unit, you stated that the vendor drawings for these valves has been revised to specify ASTM Specificatiom A564-630-1150 material for future stud replacement. The bolt material procurement process for the Crane-Alloyco valves has been revised to include an evaluation of maximum allowable tensile strength during receipt inspection. Because properly heat-treated SA193 Grade B6 material has a low probability for stress corrosion cracking in a borated water environment, you consider this material to be a suitable replacement material for studs in the Crane-Alloyco valves.

We have completed our review of your responses to the bulletin. You have disassembled and inspected certain swing check valves and reported the results of these inspections as requested by the bulletin. These inspections were conducted and reported in a timely manner as also requested by the bulletin. Based on this, the staff concludes that your responses to the bulletin are acceptable and TAC Nos. 74311 (Unit 1) and 74312 (Unit 2) for NRC Multiplant Action X9-002 are closed.

Therefore, the licensing review of this material is completed. The documentation of the valve inspections are to be maintained as specified in Section 6.10 of the Technical Specifications and may be the subject of a future NRC inspection.

Sincerely,

Original signed by Suzanne Black for

Frederick J. Hebdon, Director
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

cc: See next page

Distribution

Docket File	
NRC PDR	
Local PDR	
S. Varga	14-E-4
G. Lainas	14-H-3
F. Hebdon	
S. Black	
B. Wilson	RII
W. Little	RII
J. Brady	RII
M. Krebs	
J. Donohew	
H. Rood	13-E-16
OGC	15-B-18
E. Jordan	MNBB-3701
ACRS (10)	
SQN Rdg. File	

	:PDII-4/LA	:PDII-4/PM	:PDV/PM	:PDII-4/DD	:PDII-4/D
NAME	:MKrebs MK	:JDonohew:as	:HRood	:SBlack	:FHebdon
DATE	: 1/8/90	: 1/8/91	: 1/10/90	: 1/11/90	: 1/11/90

OFFICIAL RECORD COPY
Document Name: BULLETIN 89-02 RESPONSE

Mr. Oliver D. Kingsley, Jr.

cc:

Mr. Marvin Runyon, Chairman
Tennessee Valley Authority
ET 12A 7A
400 West Summit Hill Drive
Knoxville, Tennessee 37902

Mr. Edward G. Wallace
Manager, Nuclear Licensing
and Regulatory Affairs
Tennessee Valley Authority
5N 157B Lookout Place
Chattanooga, Tennessee 37402-2801

Mr. John B. Waters, Director
Tennessee Valley Authority
ET 12A 9A
400 West Summit Hill Drive
Knoxville, Tennessee 37902

Mr. W. F. Willis
Chief Operating Officer
ET 12B 16B
400 West Summit Hill Drive
Knoxville, Tennessee 37902

General Counsel
Tennessee Valley Authority
400 West Summit Hill Drive
ET 11B 33H
Knoxville, Tennessee 37902

Mr. Dwight Nunn
Vice President, Nuclear Projects
Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dr. Mark O. Medford
Vice President, Nuclear Assurance,
Licensing and Fuels
Tennessee Valley Authority
6N 38A Lookout Place
Chattanooga, Tennessee 37402-2801

Mr. Joseph Bynum, Acting Site Director
Sequoyah Nuclear Plant
Tennessee Valley Authority
P. O. Box 2000
Soddy Daisy, Tennessee 37379

Ms. Marci Cooper
Site Licensing Manager
Sequoyah Nuclear Plant
P. O. Box 2000
Soddy Daisy, Tennessee 37379

County Judge
Hamilton County Courthouse
Chattanooga, Tennessee 37402

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W.
Atlanta, Georgia 30323

Mr. Paul E. Harmon
Senior Resident Inspector
Sequoyah Nuclear Plant
U.S. Nuclear Regulatory Commission
2600 Igou Ferry Road
Soddy Daisy, Tennessee 37379

Mr. Michael H. Mobley, Director
Division of Radiological Health
T.E.R.R.A. Building, 6th Floor
150 9th Avenue North
Nashville, Tennessee 37219-5404

Tennessee Valley Authority
Rockville Office
11921 Rockville Pike
Suite 402
Rockville, Maryland 20852