

TFC



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TEXAS 76012

October 29, 1979

In Reply Refer To:
RIV

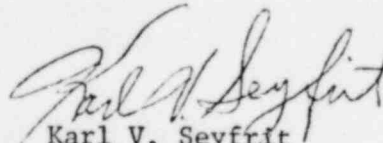
Docket Nos. 50-445/IE Bulletin No. 79-17, Revision 1
50-446/IE Bulletin No. 79-17, Revision 1

Texas Utilities Generating Company
ATTN: Mr. R. J. Gary, Executive Vice
President and General Manager
2001 Bryan Tower
Dallas, Texas 75201

Gentlemen:

The enclosed IE Bulletin No. 79-17, Revision 1 is forwarded to you for information. No written response is required. However, the potential corrosion behavior of safety-related systems as it regards your plant over the long term should be taken into consideration. If you desire additional information concerning this matter, please contact this office.

Sincerely,


Karl V. Seyfrit
Director

Enclosures:

1. IE Bulletin No. 79-17,
Revision 1
2. List of IE Bulletins
Issued in Last Six Months

1292 089

~~1288 049~~

7911060 047

IE Bulletin No. 79-17
Revision 1
Date: October 29, 1979
Page 1 of 5

PIPE CRACKS IN STAGNANT BORATED WATER SYSTEMS AT PWR PLANTS

Description of Circumstances:

IE Bulletin No. 79-17, issued July 26, 1979, provided information on the cracking R1
experienced to date in safety-related stainless steel piping systems at PWR R1
plants. Certain actions were required of all PWR facilities with an operating R1
license within a specified 90-day time frame. R1

After several discussions with licensee owner group representatives and R1
inspection agencies it has been determined that the requirements of Item 2, R1
particularly the ultrasonic examination, may be impractical because of R1
unavailability of qualified personnel in certain cases to complete the R1
inspections within the time specified by the Bulletin. To alleviate this R1
situation and allow licensees the resources of improved ultrasonic inspection R1
capabilities, a time extension and clarifications to the bulletin have been R1
made. These are referenced to the affected items of the original bulletin. R1

During the period of November 1974 to February 1977 a number of cracking incidents
have been experienced in safety-related stainless steel piping systems and por-
tions of systems which contain oxygenated, stagnant or essentially stagnant bor-
ated water. Metallurgical investigations revealed these cracks occurred in the
weld heat affected zone of 8-inch to 10-inch type 304 material (schedule 10 and
40), initiating on the piping I.D. surface and propagating in either an inter-
granular or transgranular mode typical of Stress Corrosion Cracking. Analysis
indicated the probable corrodents to be chloride and oxygen contamination in the
affected systems. Plants affected up to this time were Arkansas Nuclear Unit 1,
R. E. Ginna, H. B. Robinson Unit 2, Crystal River Unit 3, San Onofre Unit 1, and
Surry Units 1 and 2. The NRC issued Circular No. 76-06 (copy enclosed) in view
of the apparent generic nature of the problem.

During the refueling outage of Three Mile Island Unit 1 which began in February
of this year, visual inspections disclosed five (5) through-wall cracks at welds
in the spent fuel cooling system piping and one (1) at a weld in the decay heat
removal system. These cracks were found as a result of visual inspections
and later confirmed by liquid penetrant testing. The existence of stress corrosion
cracking was reported to the NRC in a letter dated August 1, 1979. A preliminary metallurgical ana-
lysis of a section of cracked and leaking weld joint was completed in August 1979.

R1 - Identifies those additions or revisions

1292 090

~~1288 050~~

DUPLICATE DOCUMENT

Entire document previously
entered into system under:

ANO 7908220137

No. of pages: 5

November 24, 1976

STRESS CORROSION CRACKS IN STAGNANT, LOW PRESSURE STAINLESS PIPING
CONTAINING BORIC ACID SOLUTION AT PWR's

DESCRIPTION OF CIRCUMSTANCES:

During the period November 7, 1974, to November 1, 1975, several incidents of through-wall cracking have occurred in the 10-inch, schedule 10 type 304 stainless steel piping of the Reactor Building Spray and Decay Heat Systems at Arkansas Nuclear Plant No. 1.

On October 7, 1976, Virginia Electric and Power also reported through-wall cracking in the 10-inch schedule 40 type 304 stainless discharge piping of the "A" recirculation spray heat exchanger at Surry Unit No. 2. A recent inspection of Unit No. 1 Containment Recirculation Spray Piping revealed cracking similar to Unit No. 2.

On October 8, 1976, another incident of similar cracking in 8-inch schedule 10 type 304 stainless piping of the Safety Injection Pump Suction Line at the Ginna facility was reported by the licensee.

Information received on the metallurgical analysis conducted to date indicates that the failures were the result of intergranular stress corrosion cracking that initiated on the inside of the piping. A commonality of factors observed associated with the corrosion mechanism were:

1. The cracks were adjacent to and propagated along weld zones of the thin-walled low pressure piping, not part of the reactor coolant system.
2. Cracking occurred in piping containing relatively stagnant boric acid solution not required for normal operating conditions.
3. Analysis of surface products at this time indicate a chloride ion interaction with oxide formation in the relatively stagnant boric acid solution as the probable corrodant, with the state of stress probably due to welding and/or fabrication.

~~1288 051~~

1292 091

DUPLICATE DOCUMENT

Entire document previously
entered into system under:

ANO

7907310200

No. of pages: _____