

DUKE POWER COMPANY  
OCONEE UNIT 2

Report Number: RO-270/81-05

Report Date: April 1, 1981

Occurrence Date: March 18, 1981

Facility: Oconee Unit 2, Seneca, South Carolina

Identification of Occurrence: Apparent Corrosion Wastage of Reactor Coolant Pump Closure Studs

Conditions Prior to Occurrence: Cold Shutdown to Inspect and Repair 2B1 RCP Motor

Description of Occurrence:

At approximately 1000 hours on March 18, 1981, it was discovered that four closure studs on Reactor Coolant Pump (RCP) 2A2 had apparent corrosion wastage in the pump closure area. This pump is located in the Reactor Building inside the secondary shield wall area. This constitutes unusual degradation of the RC pressure boundary and is thus reportable pursuant to Technical Specification 6.6.2.1.a(3).

The apparent corrosion wastage has been occurring due to closure gasket leakage. Since the unit was at cold shutdown at the time of discovery, no immediate corrective action was necessary. The incident has been reviewed with regard to 10CFR 21, and it has been determined that this event is not reportable pursuant to 10CFR 21.

The corrosion wastage that has occurred has been confined for the most part to the closure studs within the closure area. This corrosion is believed to be caused by a slight amount of leakage from the pump's closure gaskets. The leakage from the 2A2 pump was enough to visually observe. Four injection taps were installed into the casing. These were used to inject a material into the annulus above the upper closure gasket to slow the leakage rate. This work was performed by the Furmanite Company.

The Unit 2 RCP's are manufactured by Bingham Willamette Company and are type RQV, size 28x28x41, single stage quad volute pumps. The closure studs and nuts are made from a low alloy carbon steel. The pump casing is made from 304 stainless steel where the studs thread into the pump. The motor stand flange is made of forged carbon steel. The closure studs are tensioned using a Diamond Power stud tensioner to a pull of 440,000 pounds per stud. The studs are approximately 32 inches long and have 4"-8 threads. The unthreaded shank portion of the studs should be 3.836 to 3.846 inches in diameter.

The inspection that was accomplished on all studs for Unit 2 RCP's consisted of dimensional checks using an O. D. Micrometer and a U. T. measurement through the

diameter of the stud. Because of the way the pump was designed and built, a dimensional check utilizing an O. D. Micrometer could only be accomplished tangentially relative to the pump center line. Because an accurate dimensional check requires checking the diameter in at least two places, each stud was rechecked using a UT instrument. This was done in a normal direction relative to the pump centerline or looking in towards the center of the pump.

Apparent Cause of Occurrence:

The apparent cause of this incident is the result of a small amount of leakage from the pump's closure gaskets.

Analysis of Occurrence:

Evaluation revealed no stress concerns for continued operation by leaving stud numbers 1, 2, and 3 in place. Also, leakage is not considered a concern although it could change slightly, i.e., gasket surfaces should be unaffected. Based on Babcock & Wilcox's recommendation, continued operation of the unit poses no threat to the health and safety of the public.

Corrective Action:

Because Unit 2 was at cold shutdown at the time of the discovery of this incident, no immediate corrective action was required to lessen the consequences of the incident or to stabilize the problem.

Stud number 20 was removed and replaced. Stud number 3 was retensioned, and stud numbers 1 and 2 were to be left in place. The situation was evaluated, and it was determined to be acceptable to leave stud numbers 1, 2, and 3 in place.

**LICENSEE EVENT REPORT**

EXHIBIT A

CONTROL BLOCK:		(1)		(PLEASE PRINT OF TYPE ALL REQUIRED INFORMATION)	
01	7	8	9	10	11
LICENSER CODE		2000-000000000000		34111111	
LICENSER CODE		LICENSER NUMBER		LICENSER TYPE	
CONF		01		5	
REPORT SOURCE		L6		051000027070204811803048119	
REPORT SOURCE		DOCKET NUMBER		EVENT DATE	
EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)					
02	7	8	9	10	11
On March 18, 1981, it was discovered that four closure studs on RCP 2A2 had					
03	7	8	9	10	11
apparent corrosion wastage in the pump closure area. Based on Babcock and					
04	7	8	9	10	11
Wilcox's recommendation, continued operation of the unit poses no threat to					
05	7	8	9	10	11
the health and safety of the public.					
06	7	8	9	10	11
07	7	8	9	10	11
08	7	8	9	10	11
09	7	8	9	10	11
SYSTEM CODE		CAUSE CODE		COMP. SUBCODE	
C11		X12		X15	
SYSTEM CODE		CAUSE SUBCODE		COMP. SUBCODE	
C11		X12		X15	
LER/RO REPORT NUMBER		EVENT YEAR		SEQUENCE REPORT NO.	
17		81		005	
LER/RO REPORT NUMBER		EVENT YEAR		SEQUENCE REPORT NO.	
17		81		005	
ACTION TAKEN		EFFECT ON PLANT		SHUTDOWN METHOD	
A18		Z19		Z21	
ACTION TAKEN		EFFECT ON PLANT		SHUTDOWN METHOD	
A18		Z19		Z21	
CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)		HOURS		ATTACHMENT SUBMITTED	
10		0000		Y22	
CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)		HOURS		ATTACHMENT SUBMITTED	
10		0000		Y22	
11		11		12	
pump's closure gaskets. Stud number 20 was removed and replaced. Stud		11		12	
number 3 was retensioned, stud numbers 1 and 2 were left in place.		11		12	
12		13		14	
Evaluation revealed that it was acceptable to leave studs 1, 2, and 3 in		12		13	
13		14		15	
place.		13		14	
14		15		16	
		14		15	
15		16		17	
FACILITY STATUS		% POWER		OTHER STATUS	
G28		0000		NA	
FACILITY STATUS		% POWER		OTHER STATUS	
G28		0000		NA	
ACTIVITY CONTENT		AMOUNT OF ACTIVITY		LOCATION OF RELEASE	
Z32		NA		NA	
ACTIVITY CONTENT		AMOUNT OF ACTIVITY		LOCATION OF RELEASE	
Z32		NA		NA	
PERSONNEL EXPOSURES		PERSONNEL INJURIES		LOSS OF OR DAMAGE TO FACILITY	
0000		0000		NA	
PERSONNEL EXPOSURES		PERSONNEL INJURIES		LOSS OF OR DAMAGE TO FACILITY	
0000		0000		NA	
18		19		20	
0000		0000		NA	
PERSONNEL EXPOSURES		PERSONNEL INJURIES		LOSS OF OR DAMAGE TO FACILITY	
0000		0000		NA	
19		20		21	
0000		0000		NA	
PERSONNEL EXPOSURES		PERSONNEL INJURIES		LOSS OF OR DAMAGE TO FACILITY	
0000		0000		NA	
20		21		22	
N44		NA		NRC USE ONLY	
ISSUED DESCRIPTION		NRC USE ONLY		NRC USE ONLY	
N44		NA		NRC USE ONLY	
20		21		22	
N44		NA		NRC USE ONLY	
NAME OF PREPARER		J. L. Jones		PHONE: (704) 373-8197	