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Region 2, Atlanta, Office of the Director

SUBJECT: Reportable Occurrence ~~LER~~ 79-029/03L-1:on 790902,reactor vessel head flange was leaking.Caused by improper installation of incorrect O-rings.Procedures revised to assure use of correct O-rings.

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DUKE POWER COMPANY
OCONEE UNIT 1

Report Number: RO-269/79-29

Report Date: October 31, 1979

Occurrence Date: September 2, 1979

Facility: Oconee Unit 1, Seneca, South Carolina

Identification of Occurrence: Reactor Vessel Head Flange Leak

Conditions Prior to Occurrence: Hot Shutdown

Description of Occurrence:

On September 2, 1979, during an inspection of the Oconee 1 Reactor Building while the unit was in hot shutdown in anticipation of returning to power operation, water was observed to be draining from around the insulation on the reactor vessel. The insulation was removed, and steam was found to be leaking from the reactor vessel head flange. Cooldown of the unit was initiated at 0830 on September 3. On September 8, 1979, the reactor vessel head was removed, and the head flange was inspected. The inspection revealed that incorrect O-rings were in use, and that they had been installed improperly. No damage to the reactor vessel was observed, but the improper installation of the O-ring clips resulted in some small impressions on the head flange. The impressions were honed and contoured, and proper O-rings were installed prior to resetting the reactor vessel head.

Apparent Cause of Occurrence:

The reactor vessel head flange leakage resulted from improper installation of the O-ring clips during the refueling outage in September of 1978. Thermal cycling of the unit caused the clips to cut into the sealing surface, allowing slight leakage. The clips were not installed in accordance with the O-ring replacement procedure. Adding to confusion in the installation was the fact that incorrect O-rings were used. This error resulted when Duke Power Company provided to the supplier specifications which called for O-rings requiring sixteen clips rather than the type normally used at Oconee, which requires twelve clips. The supplier prepared manufacturing drawings from the inaccurate specifications, and Duke Power Company mistakenly approved those drawings.

Analysis of Occurrence:

Although slight impressions in the reactor vessel head flange resulted from improper installation of the O-ring clips, this was corrected, and no other damage was observed. The leakage was very slight, and was discovered at an early stage. If the leakage had not been discovered prior to startup of the unit, it would have been detected by the normal leakage monitoring methods before a serious degradation of the reactor coolant system boundary resulted. The leakage resulted in shutdown of the unit in accordance with Oconee Nuclear Station Technical Specification 3.1.6.2. The incident therefore resulted in conditions leading to a shutdown required by a limiting condition for operation, and must be reported pursuant to Technical Specification 6.6.2.1.b(2), although it did not affect safe operation of the unit or the health and safety of the public.

Corrective Action:

Correct O-rings were installed using the proper procedure, eliminating the source of the reactor vessel head leakage. The remaining incorrect O-rings in stock were destroyed to assure that no attempt would be made to install them in the future. In addition, the installation procedure has been revised to state explicitly the type of O-rings to be used and the correct method for installing them. The procedures have been reviewed with the responsible personnel to assure complete understanding. These steps should preclude the possibility of a recurrence of such an incident.

NRC FORM 366
(7-77)

U. S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT

EXHIBIT A

CONTROL BLOCK: | | | | | | | (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

Line	Field	Value
0 1	Licensee Code (2)	S C N E E 1
	License Number (3)	0 0 - 0 0 0 0 0 - 0 0
	License Type (4)	4 1 1 1 1
	Cat (5)	
CON'T 0 1	Report Source (6)	L
	Docket Number (7)	0 5 0 0 0 2 6 9
	Event Date (8)	0 9 0 2 7 9
	Report Date (9)	1 0 3 1 7 9

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 During an inspection of the Reactor Building prior to startup of the unit,
0 3 the reactor vessel head flange was discovered to be leaking slightly. The
0 4 leakage was minor and was completely contained within the Reactor Building.
0 5 If it had not been discovered prior to startup it would have been detected by
0 6 normal leakage monitoring methods before serious degradation of the pressure
0 7 boundary resulted. Thus, the incident did not affect safe operation of the
0 8 unit or the health and safety of the public.

Line	System Code (11)	Cause Code (12)	Cause Subcode (13)	Component Code (14)	Comp. Subcode (15)	Valve Subcode (16)
0 9	C A	A	C	V E S S E L	A	Z

(17) LER/RO REPORT NUMBER

Event Year		Sequential Report No.		Occurrence Code	Report Type		Revision No.
7 9	—	0 2 9	/	0 3	L	—	1

Action Taken (18)	Future Action (19)	Effect on Plant (20)	Shutdown Method (21)	Hours (22)	Attachment Submitted (23)	NPRD-4 Form Sub. (24)	Prime Comp. Supplier (25)	Component Manufacturer (26)
A	G	C	Z	0 3 3 0	Y	Y	L	U 0 7 0

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 The head flange leakage resulted from improper installation of incorrect O-
1 1 rings. The incorrect O-rings were supplied because inaccurate specifications
1 2 were provided to the manufacturer by Duke Power. The installation procedure
1 3 has been revised to assure that the correct O-rings are used and that they
1 4 are properly installed.

Line	Facility Status (28)	% Power (29)	Other Status (30)	Method of Discovery (31)	Discovery Description (32)
1 5	G	0 0 0	NA	B	Routine Reactor Building Inspection

Line	Activity Released (33)	Content of Release (34)	Amount of Activity (35)	Location of Release (36)
1 6	Z	Z	NA	NA

PERSONNEL EXPOSURES

Line	Number (37)	Type (38)	Description (39)
1 7	0 0 0	Z	NA

PERSONNEL INJURIES

Line	Number (40)	Description (41)
1 8	0 0 0	NA

LOSS OF OR DAMAGE TO FACILITY (43)

Line	Type (42)	Description
1 9	Z	NA

PUBLICITY

Line	Issued (44)	Description (45)	NRC Use Only
2 0	N	NA	

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