

# REGULATOR INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8203170205      DOC. DATE: 82/03/12      NOTARIZED: NO      DOCKET #  
 FACIL: 50-269 Oconee Nuclear Station, Unit 1, Duke Power Co.      05000269  
 50-270 Oconee Nuclear Station, Unit 2, Duke Power Co.      05000270  
 50-287 Oconee Nuclear Station, Unit 3, Duke Power Co.      05000287

AUTH. NAME      AUTHOR AFFILIATION  
 PARKER, W.O.      Duke Power Co.  
 RECIP. NAME      RECIPIENT AFFILIATION  
 DENTON, M.R.      Office of Nuclear Reactor Regulation, Director  
 STOLZ, J.F.      Operating Reactors Branch 4

SUBJECT: Forwards response to 820308 request for justification for continued operation in light of problems w/HPI nozzle thermal sleeve area. Safe operation justified through completion of respective fuel cycles for Units 2 & 3.

DISTRIBUTION CODE: A001S      COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 2  
 TITLE: General Distribution for after Issuance of Operating License

NOTES: AEOD/Ornstein: 1cc.      05000269  
 AEOD/Ornstein: 1cc      05000270  
 AEOD/Ornstein: 1cc      05000287

RECIPIENT		COPIES		RECIPIENT		COPIES	
ID	CODE/NAME	LTTR	ENCL	ID	CODE/NAME	LTTR	ENCL
ORB #4	BC      01	13	13				
INTERNAL:	ELD	1	0	IE	06	1	1
	NRR/DHFS DEPY08	1	1	NRR/DL DIR		1	1
	NRR/DI/ORAB	1	0	NRR/DSI/RAB		1	1
	<u>REG FILE</u> 04	1	1	RGN2		1	1
EXTERNAL:	ACRS      09	10	10	LPDR	03	1	1
	NRC PDR      02	1	1	NSIC	05	1	1
	NTIS	1	1				

TOTAL NUMBER OF COPIES REQUIRED: LTTR

36      34  
 34 ENCL      34

# DUKE POWER COMPANY

POWER BUILDING

422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.  
VICE PRESIDENT  
STEAM PRODUCTION

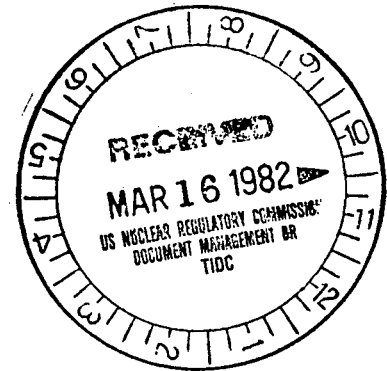
March 12, 1982

TELEPHONE: AREA 704  
373-4083

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Attention: Mr. J. F. Stolz, Chief  
Operating Reactors Branch No. 4

Re: Oconee Nuclear Station  
Docket Nos. 50-269, -270, -287



Dear Sir:

This letter is in response to a request by the Staff during a March 8, 1982 meeting with the Babcock and Wilcox Regulatory Response Group for a justification for continued operation in light of recently discovered problems in the HPI nozzle/thermal sleeve area. Attached please find information on the inspections, results, and corrective action for the Oconee Nuclear Station.

Attachment 1 shows the inspections and results for all Oconee units. Attachment 2 is a word summary of the findings. As indicated in these attachments all HPI nozzle-safe end-pipe areas on all Oconee units have been Radiographically and Ultrasonically Tested (RT and UT). In addition, Dye Penetrant Tests (PT) and visual inspections have been performed on the inside diameter (ID) of nozzles 1A2, 3A2, and will be done on 3B1, 2B1 and 2B2 as the thermal sleeves are repaired.

All tests have shown that there are no abnormal indications in any of the Oconee 1 nozzle areas. Oconee 1 has a unique HPI thermal sleeve design which incorporates two thermal sleeves locked together and in place.

As indicated in Attachments 1 and 2, three anomalies were found in Oconee 2 thermal sleeves (nozzles 2A2, 2B1 and 2B2) and one safe end-pipe area had cracks (2A2). There were two anomalies found in the Oconee 3 thermal sleeves (3A2 and 3B1) and one safe end-pipe area had cracks (3A2). Oconee 2 and 3 have similar HPI piping configurations and thermal sleeve design.

Although the exact cause of the anomalies in these areas is unknown, there are several observations which can be made. The radiographic tests (RT) have accurately indicated the position of the thermal sleeves, and the ultrasonic tests (UT) have accurately indicated the presence of cracks. Thermal sleeve anomalies have been seen on both A and B loops of Oconee 2 and 3 but cracks have only been found on nozzles 2A2 and 3A2 in the presence of loose thermal sleeves. The cracks discovered in these two areas have been

A001  
3  
/

Mr. Harold R. Denton, Director  
March 12, 1982  
Page 2

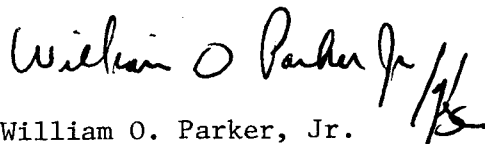
longitudinal in nature with appearances characteristic of thermally induced stress cracks. The Oconee 1 thermal sleeve design is more resistant to movement and there have been no abnormal indications on any Oconee 1 HPI nozzle area. This is especially significant since Oconee 1 has achieved the most Full Power Years (5.1) of any Babcock and Wilcox unit and a higher than average number of HPI activations (approximately 20).

Repairs have been initiated to correct anomalies found on Oconee 2 and 3 nozzle areas. Attachment 3 shows the newly designed thermal sleeve modification being used to repair the 3A2 nozzle area. This design incorporates a safe end modification to facilitate thermal sleeve installation from the extension of the RC Piping. The outboard portion of the thermal sleeve/safe end interface area will be hard roll expanded and the inboard thermal sleeve/nozzle interface area will be contact roll expanded. The outboard end of the thermal sleeve also incorporates a flange which will prevent the sleeve from entering the reactor coolant system in the unlikely event that the roll expansion is lost. The radiograph of 3B1 nozzle area indicated the thermal sleeve is loose. To repair this thermal sleeve, the piping connection to the safe end will be cut, inspections of the accessible ID surface will be performed and the thermal sleeve will be hard roll expanded. This repair will return the nozzle area to its intended condition and has been conservatively analyzed to be acceptable for at least the remaining number of design HPI flow initiation cycles. This assumes that no indications are found on the internal surface inspections.

The repair effort on Oconee 2 has not been fully planned but is expected to be similar to the repairs on Oconee 3. The 2A2 safe end and thermal sleeve will be replaced with the new design safe end and thermal sleeve. The 2B1 and 2B2 thermal sleeves will be replaced with the new design thermal sleeve.

Based on the inspections and analysis performed to date and the inspections and repairs presently planned on Oconee 2 and 3, the safe operation of the Oconee units is fully justified at least through the completion of their respective fuel cycles. An inspection plan to monitor these areas will be developed prior to the next refueling outage of Oconee 3, and further detailed analysis will be performed to try to determine the root cause of the problem.

Very truly yours,



William O. Parker, Jr.

JFN/php  
Attachment

Mr. Harold R. Denton, Director  
March 12, 1982  
Page 3

cc: Mr. James P. O'Reilly, Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region II  
101 Marietta Street, Suite 3100  
Atlanta, Georgia 30303

OCONEE NUCLEAR STATION  
STATUS OF HPI NOZZLES

<u>NOZZLE</u>	<u>THERMAL SLEEVE</u>	<u>PIPE CRACK</u>	<u>RADIOGRAPH</u>	<u>PT INSIDE</u>	<u>SAFE END/PIPE UT SPECIAL</u>
1A1	OK	No	Yes	No	Yes
1A2	OK	No	Yes	Yes	Yes
1B1	OK	No	Yes	No	Yes
1B2	OK	No	Yes	No	Yes
2A1	OK	No	Yes	No	Yes
2A2	Loose <sup>(4)</sup>	Yes <sup>(2)</sup>	Yes	No (6)	Yes
2B1	Loose	No	Yes	No (6)	Yes
2B2	Cracked <sup>(5)</sup>	No	Yes	No (6)	Yes
3A1	OK	No	Yes	No	Yes
3A2	Loose <sup>(4)</sup>	Yes <sup>(3)</sup>	Yes	Yes	Yes <sup>(1)</sup>
3B1	Loose	No	Yes	No (6)	Yes
3B2	OK	No	Yes	No	Yes

NOTES:

(1) After PT

(2) 6 longitudinal cracks; 1" - 2" length; started in safe end and runs into piping distributed 360° around.  
No depth information.

(3) >12 longitudinal cracks, ~6" long; started in safe end and runs into piping; distributed 360° around;  
1 crack at 20% of wall thickness, other less.

(4) Weld buttons missing, gap in rolled area ~1/16" - 1/8".

(5) Cracked in rolled area.

(6) To be done this outage.

OCONEE 1 - HPI/MAKEUP NOZZLE INSPECTION RESULTS

I. NOZZLES A1 & A2 (MAKEUP), B1 & B2 (HPI)

- BASED ON RT - PIPES UNCUT
  - T.S. IN POSITION AND TIGHT
  - UPSTREAM WELD BUTTONS O.K.
  - NO INDICATIONS IN T.S. OR SAFE END

II. NOZZLE A2 (MAKEUP) - ATTACHED PIPE CUT

- BASED ON PT, UT, VISUAL & MECH.
  - T.S. IN POSITION AND TIGHT
  - UPSTREAM WELD BUTTONS O.K.
  - NO PT INDICATIONS ON ID OF SAFE END, T.S. OR ATTACHED PIPING
  - NO UT INDICATIONS ON ID OF SAFE END AND ATTACHED PIPING

OCONEE 2 - HPI/MAKEUP NOZZLE INSPECTION RESULTS

I. NOZZLE A1 (MAKEUP)

- BASED ON RT & UT
  - T.S. IN POSITION AND TIGHT
  - UPSTREAM WELD BUTTONS O.K.
  - NO INDICATIONS IN T.S., SAFE END, OR UPSTREAM PIPING

II. NOZZLE A2 (MAKEUP)

- BASED ON RT & UT
  - RADIAL GAP ( $\sim 1/16$ ) BETWEEN T.S. & SAFE END
  - UPSTREAM WELD BUTTONS MISSING
  - UT INDICATIONS ON ID OF SAFE END AND UPSTREAM PIPING

III. NOZZLE B1 (HPI)

- BASED ON RT & UT
  - RADIAL GAP ( $\sim 1/32$ ) BETWEEN T.S. & SAFE END
  - T.S. IN POSITION
  - UPSTREAM WELD BUTTONS O.K.
  - NO INDICATIONS IN T.S., SAFE END, OR ATTACHED PIPING

#### IV. NOZZLE B2 (HPI)

- BASED ON RT & UT
  - T.S. IN POSITION AND TIGHT
  - 360° CIR. CRACK IN T.S. IN ROLL REGION
  - UPSTREAM WELD BUTTONS O.K.
  - NO INDICATIONS ON SAFE END & UPSTREAM PIPING

### OCONEE 3 - HPI/MAKEUP NOZZLE INSPECTION RESULTS

#### I. NOZZLES A1 (MAKEUP)& B2 (HPI)

- BASED ON RT & UT
  - T.S. IS IN POSITION & TIGHT
  - UPSTREAM WELD BUTTONS O.K.
  - NO INDICATIONS IN T.S. OR SAFE END

#### II. NOZZLE A2 (MAKEUP)

- RT & UT RESULTS
  - T.S. OUT OF POSITION 5/8" UPSTREAM
  - RADIAL GAP BETWEEN T.S. & SAFE END
  - UPSTREAM WELD BUTTONS MISSING
  - UT INDICATIONS ON SAFE END AND UPSTREAM PIPING ID
- VISUAL AND PT RESULTS - T.S. & SAFE END REMOVED
  - WEAR OBSERVED ON T.S. OD
  - PT INDICATIONS ON SAFE END AND UPSTREAM PIPING ID
  - UPSTREAM BUTTONS WORN AWAY
  - DOWNSTREAM BUTTONS PARTIALLY WORN
  - SHALLOW IMPRESSION (1/16 x 1) WORN IN NOZZLE CLADDING
  - NOZZLE BORE AND NOZZLE/PIPE RADIUS PT CLEAR

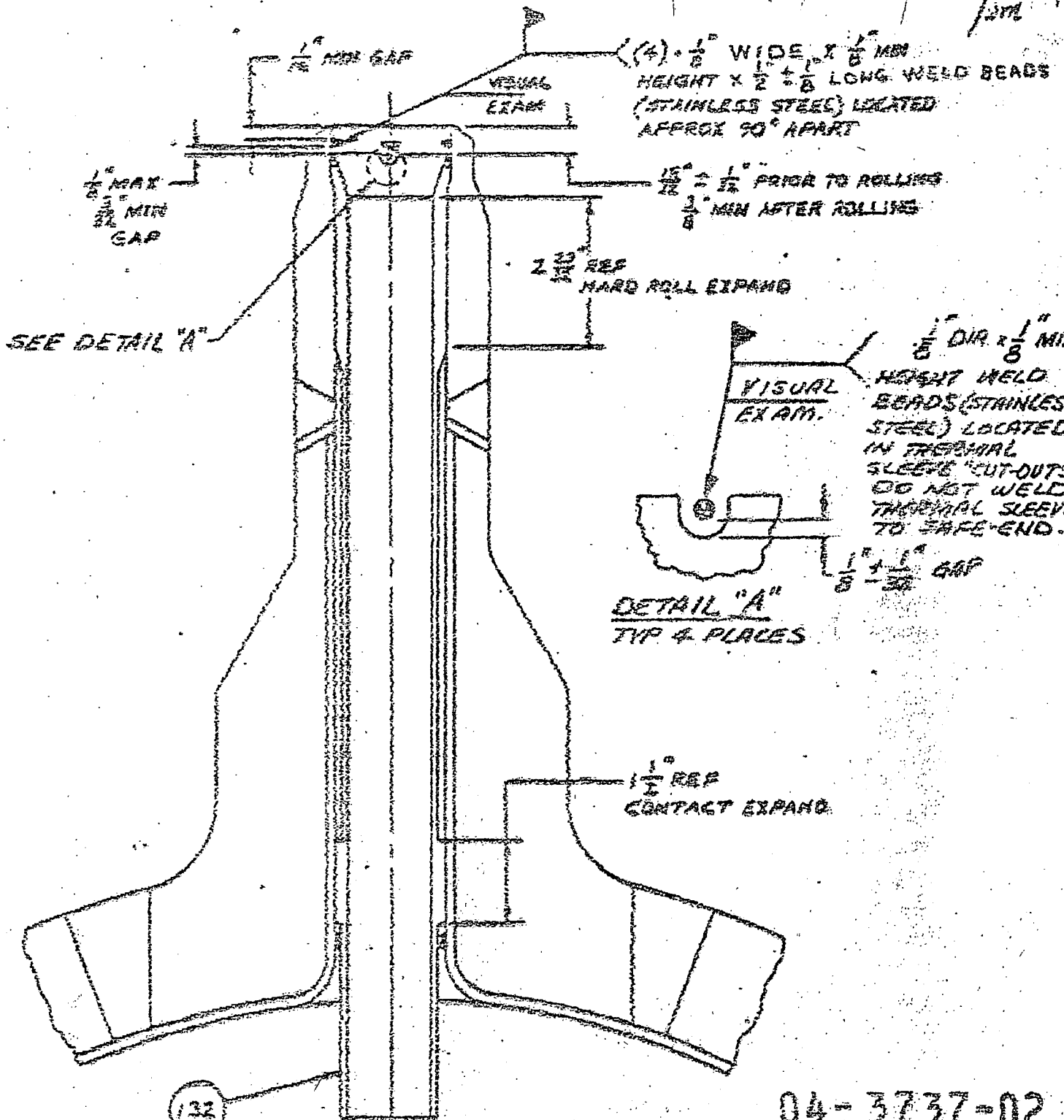
#### III. NOZZLES B1 (HPI)

- BASED ON RT
  - RADIAL GAP (~10-30 MILS) BETWEEN T.S. AND SAFE END
  - T.S. IS IN POSITION
  - UPSTREAM WELD BUTTONS ARE SLIGHTLY WORN
- BASED ON UT
  - NO INDICATIONS IN T.S., SAFE END, OR UPSTREAM PIPING

## ATTACHMENT 3

REVISIONS				DATE
INSTR.	NO.	REVISION	DATE	
1		NEW HOLE DRILLING		
		NOZZLE END		
		1974		

2 1/2 1/2 ADDED DETAIL "A"  
BSP  
L. S. S. S. S.  
/ 271



REF ID: A66155 1130007A

04-3737-02  
SHEET 31 OF 43

SPARKS	2	INSTALLATION OF THERMAL	NONE	6-17-51
VOL	1	SLEEVE IN HPI MAKE-UP NOISE	1130000	A-2