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DUKE POWER COMPANY

OCONEE NUCLEAR STATION

UNIT 1

REACTOR BUILDING

POST-TENSIONING SYSTEM

END ANCHORAGE SURVEILLANCE

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1.0

INTRODUCTION

The end anchorage concrete surveillance program for the Oconee Nuclear Station, Unit 1 reactor building post-tensioning system was defined and is executed in order to assure the continued structural integrity of the Reactor Building. The program consists of periodic inspections of selected end anchorages and adjacent concrete surfaces.

The requirements for the program are detailed in the Oconee Nuclear Station, Units 1 and 2, Technical Specification 4.4.2.3. The inspection interval, as specified therein, will be one-half year and one year after the operation of the unit and will occur during the warmest and coldest part of the year. Consequently, the specified surveillance was performed on July 26 and 31, 1973 and January 23, 1974. Results were compared with similar surveillance performed during the Reactor Building Structural Integrity Test of July 29 through August 4, 1971.

Surveillance was conducted in accordance with approved test procedure TP/1/B/0150/13 Prestressing Tendon Anchor Zone Surveillance Program, and the results of this program are reported herein.

The inspections at the one-half year and one year intervals after operation were performed as specified during the warmest and coldest part of the year. Due to a very mild winter, there was little difference in outside air temperatures during the inspections.

Visual inspection of the end anchorage exterior surfaces revealed no symptoms of abnormal cracking or deterioration.

Measurements of tendon anchor movement showed no abnormal motion during the surveillance program.

Based on the tests and inspections described herein, it is concluded that greater than normal cracking or movements have not occurred and that the functional capability of this portion of the post-tensioning system has not diminished. Therefore, the requirements of Technical Specification 4.4.2.3 have been completed.

3.0 RESULTS

3.1 END ANCHORAGE CONCRETE SURVEILLANCE

Six locations along the 90° buttress and one location on top of the ring girder in line with the 90° buttress were selected and examined during the Reactor Building Structural Integrity Test. Each of these areas were selected after an overall visual inspection of the accessible buttress areas. Results of inspections made during the Reactor Building Structural Integrity Test and at the one-half year and one year intervals following initial operation, are presented in Table 1.

3.2 TENDON ANCHOR MOVEMENTS

Position measurements for three of the tendon anchors were made during the Reactor Building Structural Integrity Test and at the one-half year and one year intervals following initial operation. Results of these measurements are given in Table 2. Details of the demountable reference frames and the location of measurements are shown on Figure 1.

TABLE 1
CONCRETE CRACK DATA AT PRESTRESSING TENDON ANCHORS

Frame	Elevation	Date	RB Temperature (°F)		RB	Observed Condition
			Inside*	Outside	Pressure (Psig)	
1	810	7-28-71	78	**	0	No Surface Cracks
		7-30-71	78	72	29.5	No change
		8-1-71	78	73	48	No change
		8-1-71	83	84	68	No change
		8-2-71	83	73	59	No change
		8-3-71	82	73	30	No change
		8-3-71	82	90	0	No change
		7-26-73	98	74	0	No change
		1-23-74	75	73	0	No change
2	835	7-28-71	78	**	0	Small crack (0.002") and some spalling
		7-30-71	78	72	29.5	No change
		8-1-71	78	73	48	No change
		8-1-71	83	84	68	No change
		8-2-71	83	73	59	No change
		8-3-71	82	73	30	No change
		8-3-71	82	90	0	No change
		7-26-73	98	74	0	No change
		1-23-74	75	73	0	No change
3	860	7-28-71	78	**	0	Several small cracks (0.002" x 4" max.)
		7-30-71	78	72	29.5	No change
		8-1-71	78	73	48	No change
		8-1-71	84	84	68	No change
		8-2-71	84	73	59	No change
		8-3-71	83	73	30	No change
		8-3-71	83	90	0	No change
		7-26-73	98	74	0	No change
		1-23-74	75	73	0	No change
4	890	7-28-71	79	**	0	Some spalling on bearing plate
		7-30-71	79	72	29.5	No change
		8-1-71	79	73	48	No change
		8-1-71	84	84	68	No change
		8-2-71	84	73	59	No change
		8-3-71	83	73	30	No change
		8-3-71	83	90	0	No change
		7-26-73	98	74	0	No change
		1-23-74	75	73	0	No change

<u>Frame</u>	<u>Elevation</u>	<u>Date</u>	<u>RB Temperature (°F)</u>		<u>RB Pressure (Psig)</u>	<u>Observed Condition</u>
			<u>Inside*</u>	<u>Outside</u>		
5	920	7-28-71	79	**	0	No initial cracks
		7-30-71	79	72	29.5	No change
		8-1-71	79	73	48	No change
		8-1-71	84	84	68	No change
		8-2-71	84	73	59	No change
		8-3-71	83	73	30	No change
		8-3-71	83	90	0	No change
		7-26-73	98	74	0	Hairline crack on buttress face
		1-23-74	75	73	0	No change
6	940	7-28-71	83	**	0	2 small cracks (0.002" x 6")
		7-30-71	83	72	29.5	No change
		8-1-71	83	73	49	No change
		8-1-71	85	84	68	No change
		8-2-71	85	73	59	No change
		8-3-71	84	73	30	No change
		8-3-71	84	90	0	No change
		7-26-73	98	74	0	Chip found on exterior face of RB shell
		1-23-74	75	73	0	No change
7 (Vertical)	970'8"	7-28-71	85	**	0	No initial cracks; surface coated
		7-30-71	85	72	29.5	No change
		8-1-71	84	73	48	No change
		8-1-71	86	84	68	No change
		8-2-71	86	73	59	No change
		8-3-71	85	73	30	No change
		8-3-71	85	90	0	No change
		7-26-73	98	74	0	No change
		1-23-74	75	73	0	No change

*RB temperatures (inside) were derived from data given in the Oconee

Nuclear Station, Unit 1 Integrated Leak Rate Test Report, October 29, 1971.

**Data not taken.

TABLE 2
PRESTRESSING TENDON ANCHOR MOVEMENTS

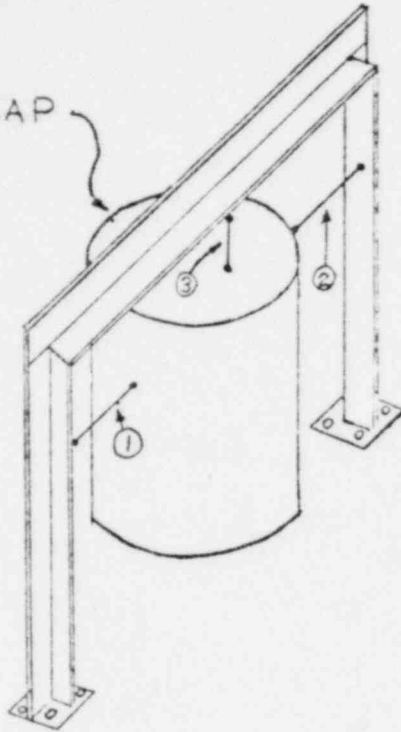
Elevation (Feet)	Date	RB Exterior Temperature (°F)	RB Pressure (Psig)	Micrometer Readings (In.)			
				1	2	3	4
810	7-28-71	*	0	4.441	2.735	4.077	4.012
	7-30-71	72	29.5	4.441	2.735	4.080	4.009
	8-1-71	73	48	4.441	2.735	4.082	4.012
	8-1-71	84	68	4.441	2.735	4.080	4.009
	8-2-71	73	59	4.441	2.740	4.078	4.009
	8-3-71	73	30	4.441	2.735	4.078	4.009
	8-3-71	90	0	4.441	2.738	4.080	4.012
	7-31-73	73	0	4.426	2.748	4.074	3.998
	1-23-74	73	0	4.411	2.738	4.075	4.000
	940	7-28-71	*	0	4.670	4.548	4.029
7-30-71		72	29.5	4.670	4.547	4.034	3.690
8-1-71		73	49	4.670	4.545	4.032	3.690
8-1-71		84	68	4.670	4.548	4.032	3.690
8-2-71		73	59	4.670	4.552	4.036	3.693
8-3-71		73	30	4.670	4.552	4.034	3.693
8-3-71		90	0	4.665	4.552	4.036	3.693
7-31-73		73	0	4.672	4.547	4.035	3.700
1-23-74		73	0	4.654	4.567	4.025	3.679
Dome		7-28-71	*	0	5.392	4.899	4.991
	7-30-71	72	29.5	5.392	4.899	4.991	
	8-1-71	73	48	5.392	4.899	4.991	
	8-1-71	84	68	5.392	4.899	4.991	
	8-2-71	73	59	5.392	4.899	4.991	
	8-3-71	73	30	**	**	**	
	8-3-71	90	0	5.392	4.899	4.991	
	7-31-73	73	0	5.394	4.902	4.992	
	1-23-74	73	0	5.404	4.966	4.952	

*Data not taken.

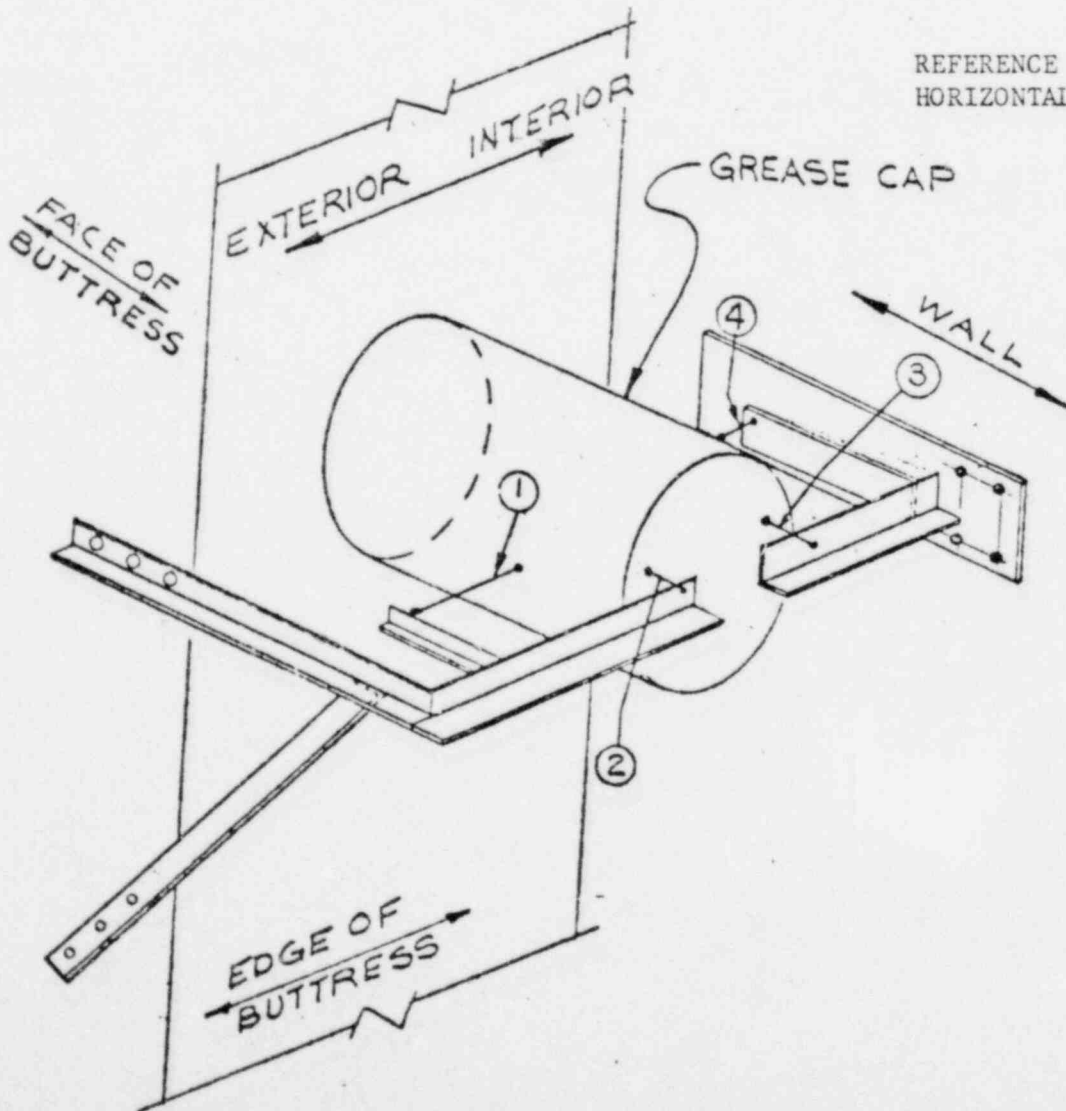
**Data not recorded due to rain and inaccessibility of crane.

Figure 1

GREASE CAP



REFERENCE FRAME FOR
VERTICAL TENDONS



REFERENCE FRAME FOR
HORIZONTAL TENDONS