

Docket No. 50-255

September 14, 1992

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Mr. Gerald B. Slade
Plant General Manager
Consumers Power Company
Palisades Plant
27780 Blue Star Memorial Highway
Covert, Michigan 49043

Dear Mr. Slade:

SUBJECT: REVIEW OF PALISADES CONTAINMENT 20TH YEAR TENDON SURVEILLANCE REPORT
REQUEST FOR ADDITIONAL INFORMATION (TAC NO. M84017)

By letter dated June 16, 1992, Consumers Power Company submitted the 20-year containment tendon surveillance report for the Palisades plant. The staff has reviewed the report and finds that more information is needed before the review can be completed. The required information is contained in the enclosure. Your response to this request is greatly appreciated since your recent steam generator replacement project has provided a valuable opportunity for insights and information which would not normally be available.

The requested information contained in this letter affects fewer than ten respondents; OMB clearance is not required under P.L. 96-511.

Sincerely,

Original signed by:

Armando Masciantonio, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
See next page

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DATE	9/11/92	9/14/92	9/14/92

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*Memo
for
DFC*

Mr. Gerald B. Slade
Consumers Power Company

Palisades Plant

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Request for Additional Information
Palisades 20th Year Tendon Surveillance Report
Docket No. 50-255
Structural and Geosciences Branch

1. In the last paragraph of section 2 Item II, Sheathing Filler, you stated that grease leaks observed at 30 anchor locations beyond the selected surveillance tendons were repaired and the results are summarized in Table XIA. We note from the table that the tendon grease cans which needed repair are those of the vertical tendons which were detensioned on one side of the SG transfer opening. There are similar detensioned tendons on the other side of the steam generator(SG) transfer opening, which did not have the same problem. Explain why there is such a difference. Besides the grease leakage at the anchor locations indicate if there are signs of grease leakage at locations away from the anchors: Discuss the potential detrimental effect of grease leakage into concrete.
2. According to the information provided to the staff at the time of SG replacement, there were fifteen (15) vertical tendons and thirty-seven(37) hoop tendons passing through the transfer opening which were detensioned and removed. Such an opportunity is rare and more detailed and useful information than that from the periodic surveillance can be obtained and used for evaluating the tendon integrity and assessing the adequacy of the current tendon surveillance program. Provide, if you can, any information on your experience on these tendons.
3. The tendon surveillance performed recently is the sixth (20th year). On the basis of the data collected from the six surveillances and from the SG replacement operation, a trend in the prestressing forces for each group of tendons can be established and any abnormality in the long term behavior of each group of tendons can be detected. Provide this information.
4. Data sheets 11.0 in PSC Procedure SQ.11 tabulate the observed forces and elongation measurements for tendons D2-23, V 218 and 29 AE. Since the tendon behavior at tensioning is elastic, the force required for unit elongation for each tendon should be basically linear. We realize that the preliminary tensioning force (PTF) is used in part to straighten the slack rather to stretch the tendon. On the basis of this understanding, the staff made an analysis of the information from the data sheets and the results of the analysis are shown in attached Table 1. Of the three tendons detensioned and retensioned, the results for hoop tendon 29AE are most inconsistent. On the basis of the above observation, your responses to the following questions are requested:
 - a) Provide reasons for the inconsistency in the results for hoop tendon 29AE as indicated in Table 1. Your corrective action as contained in NC/CA 417-002 does not answer this staff's concern.
 - b) In DS 11.0 item (9.9.6.2) elongation variations for tendons D2-23, V218 and 29AE are given as -3.1%, -10.3%, and -1.7% respectively. Indicate the significance of these variations, in view of the fact that friction plays an important role and cannot be accurately evaluated, especially for the curved tendons.

- c) Without taking friction into consideration, provide the force required per unit elongation for each of the three tendons. Indicate the length of each tendon.
5. Indicate how the lift-off force for each of tendons surveillanced is determined, noting that only the force at the instant when the tendon is lifted from the seating is to be counted as the lift-off force. The procedure described in item 9. 7. in PSC Procedure SQ 9.0 appears to be inadequate.

TABLE 1
FORCE PER UNIT TENDON ELONGATION

Stage	Force (kip)	Elongation (in.) FIELD END	Force/Elong. (kip/in)	Force (kip)	Elong. (in.) SHOP END	Force/Elong. (kip/in)
Tendon No. D2-23						
Step 1	350	3.0		350	4.0	
PTF	-148	-1.9		-148	-3.6	
Dif	202	1.1	183.64	202	0.4	505.00
Step 2	600	4.5		600	5.5	
Step 1	-350	-3.0		-350	-4.0	
Dif	250	1.5	166.67	250	1.5	166.67
LOF	649	4.8		625	5.7	
Step 1	-350	-3.0		-350	-4.0	
Dif	299	1.8	166.11	275	1.7	161.76
LOF	649	4.8		625	5.7	
Step 2	-600	-4.5		-600	-5.5	
Dif	49	0.3	163.33	25	0.2	125.00
OSF	839	6.2		839	7.3	
LOF	-649	-4.8		-625	-5.7	
Dif	190	1.4	135.71	214	1.6	133.75
Tendon No. 29 AE						
Step 1	350	4.3		350	4.75	
PTF	-148	-3.0		-148	-3.50	
Dif	202	1.3	155.38	202	1.25	161.60
Step 2	600	6.4		600	6.40	
Step 1	-350	-4.3		-350	-3.50	
Dif	250	2.1	119.05	250	2.90	86.21
LOF	564	6.2		685	6.90	
Step 1	-350	-4.3		-350	-4.75	
Dif	214	1.9	112.63	335	2.15	155.81
LOF	564	6.2		685	6.90	
Step 2	-600	-6.4		-600	-6.40	
Dif	-36	-0.2	180.00	85	0.50	170.00
OSF	802	7.3		802	7.60	
LOF	-564	-6.2		-685	-6.90	
Dif	238	1.1	216.36	117	0.70	167.14

Table 1 (continued)

Stage	Force (kip)	Elongation (in)	Force/Elongation (kip/in)
Tandon No. V-218 (Shop End)			
Step 1	350	7.5	
PTF	-148	-4.3	
Dif	202	3.2	63.13
Step 2	600	11.4	
Step 1	-350	-7.5	
Dif	250	3.9	64.10
LOF	631	11.95	
Step 1	-350	-7.50	
Dif	281	4.45	63.15
LOF	631	11.95	
Step 2	-600	-11.40	
Dif	31	0.55	56.36
OSF	839	15.40	
LOF	-631	-11.95	
Dif	208	3.45	60.29