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FACIL:50-275 DIABLO CANYON NUCLEAR POWER PLANT, UNIT 1, PACIFIC GA 05000275
50-323 DIABLO CANYON NUCLEAR POWER PLANT, UNIT 2, PACIFIC GA 05000323
AUTH.NAME AUTHOR AFFILIATION
CRANE,P.A. PACIFIC GAS & ELECTRIC CO.
RECIP.NAME RECIPIENT AFFILIATION
STOLZ,J.F. LIGHT WATER REACTORS BRANCH 1

SUBJECT: FORWARDS ADDL INFO ON CONTAINMENT ELECTRICAL PENETRATIONS IN RESPONSE TO NRC QUESTIONS.

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	06 I & E	2	2	08 OPERA LIC BR	1	1
	09 GEOSCIEN BR	1	1	10 QAB	1	1
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	13 MATL ENG BR	2	2	15 REAC SYS BR	1	1
	16 ANALYSIS BR	1	1	17 CORE PERF BR	1	1
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	20 I & C SYS BR	1	1	21 POWER SYS BR	1	1
	22 AD SITE TECH	4	4	26 ACCDNT ANLYS	1	1
	27 EFFL TRT SYS	1	1	28 RAD ASMT BR	1	1
	29 KIRKWOOD	1	1	AD FOR ENG	1	0
	AD PLANT SYS	1	0	AD REAC SAFETY	1	0
	AD SITE ANLYSIS	1	0	DIRECTOR NRR	1	0
	MPA	1	0	OELD	1	0
EXTERNAL:	03 LPDR	1	1	04 NSIC	1	1
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ATTORNEYS

May 17, 1979

Mr. John F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Re: Docket No. 50-275-OL
Docket No. 50-323-OL
Diablo Canyon Units 1 & 2

Dear Mr. Stolz:

The attached additional information on containment electrical penetrations is submitted in response to questions from the Staff.

Five copies of this letter have been sent directly to Mr. Bart Buckley.

Kindly acknowledge receipt of the above material on the enclosed copy of this letter and return it to me in the enclosed addressed envelope.

Very truly yours,

Philip A. Crane, Jr.

Attachments (40)
CC w/attachment: Mr. Bart Buckley
Elizabeth S. Bowers, Esq.

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CONTAINMENT ELECTRICAL PENETRATIONS

The following additional information is submitted regarding containment electrical penetrations:

Temperatures in High Voltage Penetrations

Thermal tests were conducted on an energized 18 inch High Voltage Power Penetration Assembly similar in construction to the 24 inch penetrations at Diablo Canyon. The test results (Test #EPAQ-035) are summarized below:

Maximum Conductor Temperature Rise (°C) ΔT	14	16	23	31
Current (amps) I	600	675	750	850

The above data is related ($\pm$ 10%) by $I_1^2 : I_2^2 :: \Delta T_1 : \Delta T_2$

Using the above relationship, the expected temperature rise of the conductors carrying 400 amps (the maximum current allowed by overcurrent protection through the high voltage penetrations) would be 6.22° C $\pm$ 10%, the maximum temperature rise at 300 amps would be 3.5° C $\pm$ 10% and at 266 amps (the normally connected load) would be 2.75° C $\pm$ 10%. Since the tests were conducted on an 18 inch diameter penetration the temperature rise expected in the Diablo Canyon 24 inch high voltage penetrations would be ½ less than on the penetration tested because the larger surface area would provide for greater heat transfer. Furthermore GE has determined the maximum allowable heat load for various penetration sizes. The allowables are summarized below:

MAXIMUM ALLOWABLE

EFFECTIVE HEAT LOAD

Nominal Size of Penetration	Containment Temperature 70°C	60°C	50°C	40°C
	Maximum Allowable Watts/Foot			
12"	12	18	25	32
10"	10	15	21	27
8"	8	12	17	21

Extrapolation of the above data suggests that at a Containment Temperature of 70°C, a 24 inch penetration would be allowed to safely generate 24 watts/ft. Calculations show however, that at 400 amps the heat loads would only be 8.4 watts/ft. and at 300 amps 4.7 watts/ft. This data demonstrates sufficient margin for 10 and 12 inch penetrations. The margin for the 24 inch penetration is nearly 3:1.

From the above data it can be concluded that LOCA qualification test results of the penetrations were not adversly effected by not energizing the penetration to the rated loads because actual operating heat loads are very small when compared with acceptable heat loads and actual temperature rise is very small when compared with allowable temperature rise.

Epoxy in Containment Electrical Penetrations

The following is submitted to clarify the responses of October 11, 1978 and March 7, 1979, on containment electrical penetrations.

Type XR5126 epoxy is used in both the high and low voltage penetrations used at Diablo Canyon, Unit 1. The type XR5126 epoxy is the epoxy in the penetrations tested and is chemically identical to both the high and low voltage penetrations used at Diablo Canyon, Unit 1.

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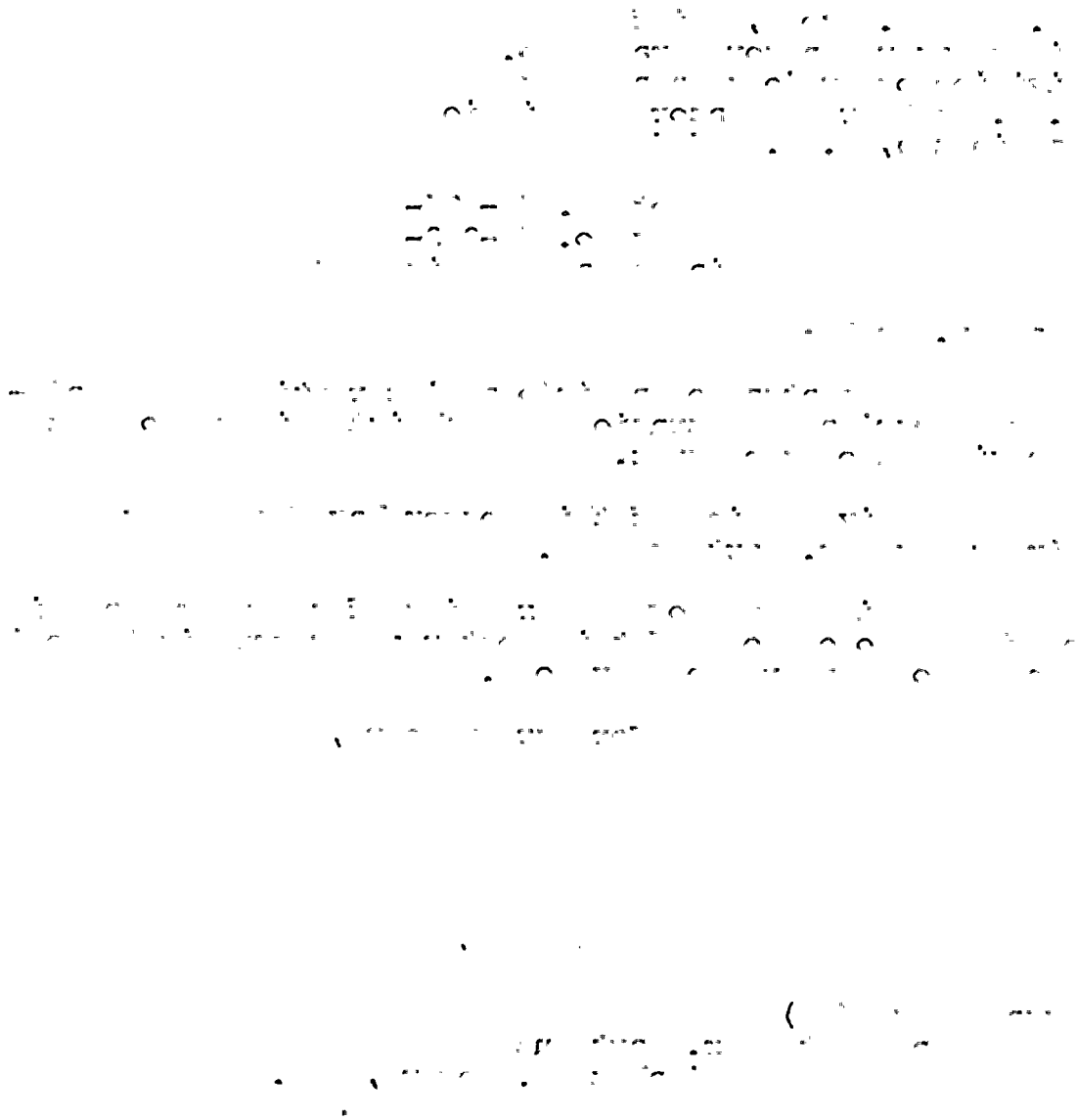

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