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REC: STOLZ J F
NRC

ORG: CRANE P A
PACIFIC GAS & ELEC

DOCDATE: 01/19/78
DATE RCVD: 01/23/78

DOCTYPE: LETTER NOTARIZED: NO
SUBJECT:
FORWARDING RESPONSE TO NRC"S INFORMAL REQUEST FOR ADDL INFO RE ENVIRON QUALIFICATION OF CONTAINMENT FAN COOLER MOTORS.

COPIES RECEIVED
LTR 1 ENCL 40

PLANT NAME: DIABLO CANYON - UNIT 1
DIABLO CANYON - UNIT 2

REVIEWER INITIAL: XJM
DISTRIBUTER INITIAL:

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PACIFIC GAS AND ELECTRIC COMPANY

PG and E

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January 19, 1978

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:

Enclosed are 40 copies of our response to an informal request by the Regulatory Staff for additional information regarding environmental qualification of containment fan cooler motors.

Kindly acknowledge receipt of this 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.

Enclosures
CC w/enc.: Service List

B001/SE
1/40 *

Reply to Informal Request for
Additional Information Related to
Environmental Qualification of Fan Coolers

1. The results of the heat transfer analysis do not address the ability of the motor's heat exchanger to maintain winding hot spot temperature below 105°C for normal operation and 92°C for the 100 hp post event operation. Also the effect of containment heat was not addressed in the heat transfer analysis. Provide the results of the requested heat transfer analysis which addresses the above items and concludes that the full-size motor will function properly when required.

Reply:

The bases of motor rise calculations are complete engineering tests of typical motors which provide not only winding temperatures (rises), but separate heat producing losses and confirm equations which characterize each relative to motor design parameters and service conditions. A number of machines are so tested to permit computer interpolation of each loss curve. This leads to simulation of any combination of motor design features, load conditions and ambients.

Periodically, the computer data bank is updated as additional tests are conducted and simulation techniques are improved. Since the current computer program is considered more precise than that in use in 1969, it was used to comply with the present request for temperature rise analysis; so a new computation is provided.

Print-outs are summarized as follows:

		Ambient (air at motor inlet)	Previously Reported		Revised Analysis	
			Rise	Total	Rise	Total
Normal	300 hp	57C Max	48C	105C	45C	102C
D.B.A.	100 hp	75C Max	47C	122C	36C	111C
Post-D.B.A.	100 hp	58C Ave.	34C	92C	34C	92C

2. The response to question G, concerning the effect of the Main Steam Line Break accident environment [PG&E letter of June 16], addressed a 324°F temperature as the Fan Coolers motors qualified temperature. This 324° temperature was used as part of the fan cooler motors test, however, the motor's heat exchanger, for which this 324° temperature is associated, was not qualified by these tests. The test motor was qualified to operate with hot spot temperatures reaching 122°C during design basis event operation. This 122°C should be considered as part of the Main Steam line break reanalysis.

Reply:

The calculated steamline break containment conditions contained a short term peak temperature of 326°F at approximately 40 psia. The analysis performed was for the saturation conditions, 326°F and the corresponding saturation pressure. The results of the analysis indicated a small increase (~ 2°F) in motor inlet air temperature, and a prior sensitivity study indicated that the motor winding temperature rise would be very insensitive to the small increase in motor air inlet temperature. Thus, the previously calculated total temperature of 111°C would increase only slightly, thereby assuring that the calculated Diablo Canyon steamline break containment conditions would not result in a total insulation temperature (winding rise + ambient air at motor inlet) in excess of 122°C.