cc: Gary Ghlert

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GE Nuclear Energy

ABWR 52-001

Date 10/6/92

To Chet Poslusny Fax No. —

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Subject Ablation of Inner Steel Plate and Fill Concrete

Message

17:119

D050 1/1

Ablation of Inner Steel Plate and Fill Concrete

Reference: Bechtel Structural Design Report, Tables S5-11 and S5-12

Per table S5-12 the pedestal current design margin for faulted conditions is 33% in the shell plates and 25% in the stiffner plates. In addition, the SSE forces and moments at this section (see table S5-11) are roughly 25% of the loads on the pedestal base. This gives without SSE a 50% margin for the pedestal. When the ablation of the pedestal happens, no SSE is assumed, therefore, providing at least 50% margin. With the ablation, the temperature induced moments will reduce as the effective thickness of the stiffners decrease. All strains from temperature induced loadings will be self limiting. The only need for stiffner plate is to prevent the outer shell from buckling. For all of these calculations, the concrete fill has been neglected.

TABLE 55-11

FORCES AND MOMENTS IN THE REACTOR PEDESTAL
AT SECTIONS 7 AND 9

SECTION	ELEMENT	LOCATION	LOADING	Fx (k/ft)	Fy (k/ft)	Fxy (k/ft)	Mx (k-ft/ft)	My (k-ft/ft)	Mxy (k-ft/ft)	Fz_1 (k/ft)	Fz_2 k/ft
7	301	180°	D + L + $Pt^{(52/52)}$	-11.0	-162.4	-0.9	-5.4	-27.9	0.0	-0.1	8.3
			D + L + $Pt^{(45/20)}$	0.8	-217.0	-1.2	-8.7	-44.4	0.1	-0.1	14.6
			D + L + 1.5 (Pa + CO) (10 min)	-33.1	-194.9	-1.2	-24.3	-122.1	0.0	-0.1	4.3
			D + L + 1.5 (Pa + CO)+1.25 SRV (6 hrs)	-51.7	-177.1	-1.0	-15.0	-74.8	0.0	-0.1	17.4
			D + L + Pa + CO (10 min)	-27.7	-179.4	-1.0	-12.0	-60.2	0.0	-0.1	-1.1
			D + L + Pa + CO + SRV (6 hrs)	-42.4	-167.4	-0.8	-6.6	-33.1	0.0	-0.1	-16.4
			SSE	120.3	402.8	26.4	162.7	685.5	14.3	4.0	75.8
			Ta (10 min)	-441.8	-51.6	-17.1	6.0	356.3	-18.0	-0.5	145.0
			Ta (6 hrs)	-963.4	-77.2	-28.4	1347.0	769.0	-19.2	-1.2	295.0

TABLE S5-12 (1 OF 2)

STEEL STRESSES IN THE REACTOR PEDESTAL
AT SECTIONS 7 & 9

Section: 7

Location: REACTOR PEDESTAL NEAR FOUNDATION MAT

LOAD COMB	ELEMENT		SHELL PLATES		STIFFENER PLATE		REMARKS
	NUMBER	AZIMUTH (degrees)	CALCULATED STRESS (ksi)	ALLOWABLE STRESS (ksi)	CALCULATED STRESS (ksi)	ALLOWABLE STRESS (ksi)	
15	301	180	15.86	41.4	11.93	25.3	
15a, 15b	301	180	27.55	41.4	19.14	25.3	

< TRANSACTION REPORT >

10-06-1992(TUE) 11:45

[RECEIVE]

NO.	DATE	TIME	DESTINATION STATION	PG.	DURATION	MODE	RESULT
8061	10-06	11:43	408 9251687	4	0°01'13"	NORM.E	OK
				4	0°01'13"		