

CLIENT: WEPCo
CLIENT NO: WEP-101
SNC NO: WEP 109,002.28

DESIGN CALCULATIONS

Alternative analysis of the MTC
well stresses during lift

Prepared by

SIERRA NUCLEAR CORPORATION

for


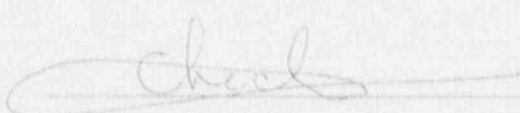
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REVISION CONTROL SHEET

<u>Rev. Date</u>	<u>Reason</u>	<u>Affected Pgs.</u>	<u>Preparer</u>	<u>Checker</u>	<u>Proj. Eng.</u>	<u>Comments/Affected Docs.*</u>
0 12.10.90	NRC question	All	BAC	cjp	BAC	None

SIGNATURES

<u>Responsibility</u>	<u>Signature</u>	<u>Initials</u>	<u>Date</u>
<u>Preparer</u>	<u></u>	<u>BAC</u>	<u>12.10.90</u>
<u>Checker</u>	<u>Charles J. Funnell</u>	<u>cjp</u>	<u>12/10/90</u>
<u>Proj. Engineer</u>	<u></u>	<u>BAC</u>	<u>12.10.90</u>
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* List Affected documents and action taken (or to be taken) or other comments in this section.

1. Introduction

This analysis has been performed per NRC staff request to evaluate bending stresses in the MTC wall.

2. Assumptions and input

MTC weight $P_{MTC} = 193,600$ lbs

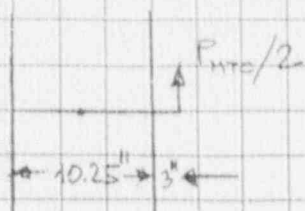
Dynamic increase factor $K = 1.1$

Roark, Edition IV, Table X, #5 was

used. Radius a has been assumed to be 36 in (as in the original analysis, WEP 109.002.) However, the calculations are not sensitive to changes in a .

Trunnion radius $r_0 = 5.4$ in

3. Calculations

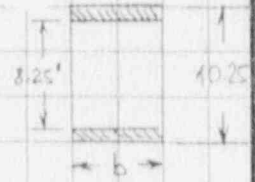


$$M = \left[\frac{P_{MTC}}{2} \right] \cdot 1.1 \cdot \left(3 + \frac{10.25}{2} \right) = 865,150 \text{ lbs}\cdot\text{in}$$

Since the MTC has a composite wall, the equivalent solid wall thickness must be found in order to use Roark. Only inside and outside shells are considered for moment resistance:

$$\frac{1}{6} b (10.25^2 - 8.25^2) = \frac{1}{6} b t^2$$

equivalent section modulus



where $b =$ width (not important)

$$t = \sqrt{10.25^2 - 8.25^2} = 6.0 \text{ in} - \text{thickness}$$

of the well with equivalent resistance to bending moment.

Roark, Table X, #5:

$$K = \frac{0.49 a^2}{(r_0 + 0.7a)^2} = 0.67$$

$$S_b = \frac{3 \cdot 865,150}{4\pi \cdot 6^2 \cdot 5.4} \left[1 + \frac{4.33}{3.33} \ln \frac{2(36 - 5.4)}{0.67 \cdot 36} \right] =$$

$$= 2,350 \text{ psi}$$

Sensitivity: if $a = 29'' \rightarrow K = 0.57 \quad S_r = 2,430 \text{ psi}$

The bending stress has to be added to the membrane stress which is

$$S_m = 6,840 \cdot \frac{1}{1.33} \cdot \frac{1}{2} = 2,570 \text{ psi},$$

where: 6,840 - value for membrane stress
calculated previously (WEP 109.002.)

1.33 - that value was calculated as
 $P_{int}/2 \left(1 + \frac{3}{9.25}\right)$ in order to resist the
bending moment.

2 - only the outer shell has been ana-
lyzed; now the membrane stress is
taken by both shells.

Thus, total stress is (outer shell)

$$S = S_m + S_b = 4,920 \text{ psi}$$

This is less than 6,840 psi previously calcu-
lated. Therefore, PSN's approach was
conservative.

$$K_w = 70/4.92 = 14.2 > 10 \text{ OK}$$

$$K_y = 46/4.92 = 9.3 > 6 \text{ OK}$$

The inner shell stress is

$$S = 2,570 - 2,250 = 320 \text{ psi} \text{ OK}$$

present and the operator lifted the MSB too much. For the short time this condition would exist, the dose rate would be acceptable. However, with the lid present it could be avoided. The situation would be quickly relieved by lowering the MSB into the dropped MTC. Thus, no fuel or safety related equipment would be impacted. This is another reason why this is not a critical lift. Also, under such a drop the MTC could not topple off of the VCC because the 18 ft long MSB held by the crane will still be inside the MTC preventing the tipover.

A lift of approximately 3 ft (see attached Figure) would be required before the MTC would be high enough to tip and get its cg over the edge such that it would fall off. This is clearly much higher than the cask could get with a failing lid. At crane speeds of 2 to 6 ft/min, 30 seconds or more would be required for the lid to hold and then fail. However, the operator is only going to "bump" the MSB weight off of the doors and, hence, the crane should only be on for less than a second. Even if the operator erred severely, the MTC would only be lifted an inch or less. Hence, even if the operator erred severely and the lid and/or bolts failed (two concurrent unlikely events), the MTC would only move a few inches or less, and (as considered in both NUREG 0612 and past Part 72 licensing conditions) a movement of 12 to 18 inches is not considered a drop. Therefore, even if everything that could go wrong went wrong the event would not be considered a heavy load drop and the MTC would not topple. The MTC is prevented from toppling by the potential height of the drop, the large area of the concrete cask and the MSB connected to the crane and still wholly or partially inside the MTC. See the attached figure for a sketch of the situation.

Lastly, even if the NRC staff still considered the potential accidental lift of the MTC by its lid as a critical lift, NUREG 0612 provides for a number of ways to meet its guidelines besides the increased factors of safety. One of these is to show by analysis that the results from off-site doses caused by the drop do not exceed 1/4 of the 10 CFR 100 limits. As shown by the attached figure (from NUREG 0612, pg 2-6), with no credit for auxiliary building filters, one would have to damage well over 5,000 five-year old assemblies to exceed 1/4 of the 10 CFR 100 limits. Hence, if the potential lift by the lid is to be considered a critical lift, PSN will meet NUREG 0612 by the following evaluation criteria (NUREG 0612, pg 5-1):

1. Doses less than 1/4 of 10 CFR 100 limits per attached figure.
2. $k_{\text{eff}} \leq 0.95$ because no moderator present.
3. No possibility of damage to reactor vessel or spent fuel pool.
4. No damage to redundant or dual safe shutdown equipment - damage will be to empty concrete cask and trailer.

In regard to the bolt diameter issue, PSN did use the gross section area for the bolt stress calculation. The actual bolt stress area is 0.696 in² (Marks' Handbook, 9th Edition, Table 8.2.2). Therefore, the bolt stress will be

HANGING MSB
WOULD PREVENT
ANY TIP-OVER
OF MTC EVEN
IT WERE RAISED
TO OVER 3 FT
(i.e. MTC cont
fall crooked
it has to slide
down MSB)

MTC
(rotated to tip position)

MTC cannot
rotate this far
due to MSB
inside.

$l = 34"$

α

94"

VCC

83.5

SCALE 1/4"

$$\alpha = \arctan\left(\frac{83.5/2}{94}\right) = 24^\circ$$

$$l = 83.5 \sin \alpha = 34"$$

NOTE WIDTH OF
VCC COMPARED
TO MTC. VCC
IS VERY STABLE
100 TON WORK
PLATFORM.

NOTE TRAILER
IS ON JACKS
DURING TRANSFER
NOT ON TIRES.
(i.e. MTC Impact
won't cause bounce)

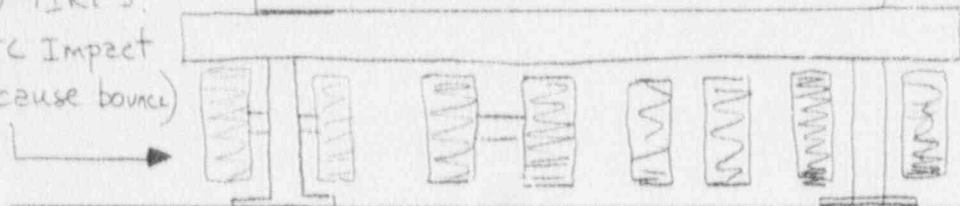


FIGURE 1 (COMMENT 2#3) SCALE DWG OF MTC/VCC

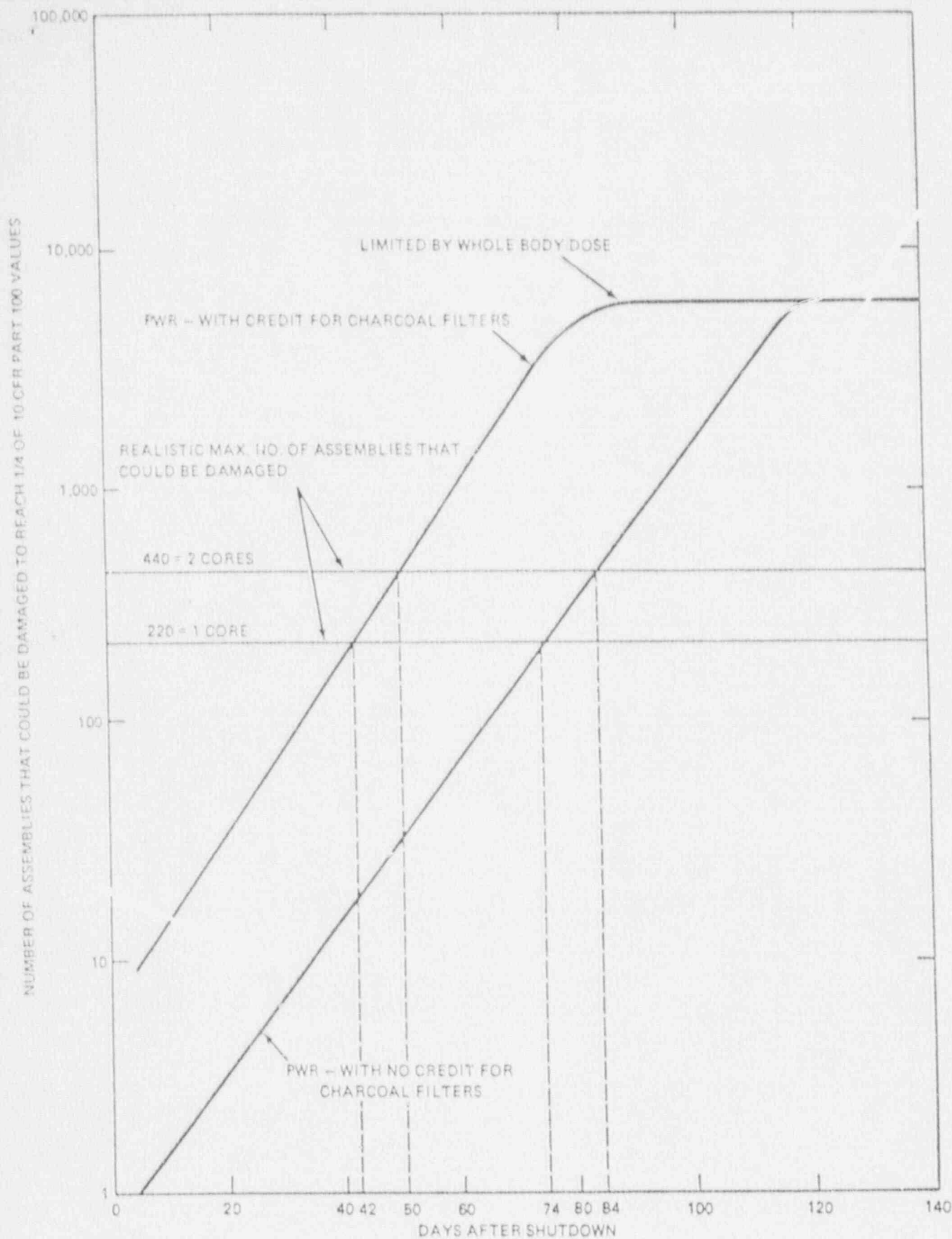


FIGURE 2.1-1 (PWR)
 NUMBER OF FUEL ASSEMBLIES THAT COULD BE DAMAGED TO REACH 1/4 OF 10 CFR PART 100 LIMITS VS TIME AFTER REACTOR SHUTDOWN

$$\sigma = 38.3 (0.7854/0.606) = 49.6 \text{ ksi}$$

This is still less than S_u of 60 ksi for the A-307 bolt.

In summary, the lid and bolts are back-up safety devices, not special lifting devices. Therefore, they are not subject to the ANSI 14.6 increased factors of safety for special lift devices used in critical lifts. The AISC allowable stress of 20 ksi is also applicable to the normal operation loads (hold lid in place during transfer). PSN has selected and used the ultimate capacity of the lid and bolts as the design criteria for their performance in unexpected or accident conditions. This is in keeping with most all structural codes. Furthermore, failure of the lid and bolts would not result in any unallowable on-site or off-site safety consequence.

II. CALCULATIONS

Comment 1

This issue was discussed over the phone in September and we were of the understanding that it had been resolved. The discussion is presented below.

2.5°F is the Lowest Service Temperature (LST) as determined by PSN. PSN also calculated that in order to avoid brittle fracture, the materials Nil Ductility Transition (NDT) Temperature has to be 35°F below the LST, i.e., -32.5°. It is our understanding that the NRC staff agrees with this. Please see attached Figure 3 of Section 5.1.1 (NUREG/CR-1815).

However, Section 5.1.1 does not relate the NDT temperature of the material to the Charpy V-notch data. This is done by Figure 2 and Section 4.2 of NUREG/CR-1815 (attached). Note that this is stated in Section 5.1.1 (bottom of page 15).

Specifically, with Charpy test at -32.5°F resulting in a value of 12.6 lb•ft, one would calculate the K_{ID} of

$$K_{ID} = (5 \cdot 12.6 \cdot 28 \cdot 10^6)^{0.5} = 42,000 \text{ psi } \sqrt{\text{in}}$$

and find from Figure 2 that -32.5°F is the NDT temperature of the material. On the other hand, if one test the material at 2.5°F and the result is 25 lb•ft, the K_{ID} is

$$K_{ID} = (5 \cdot 25 \cdot 28 \cdot 10^6)^{0.5} = 59,000 \text{ psi } \sqrt{\text{in}}$$

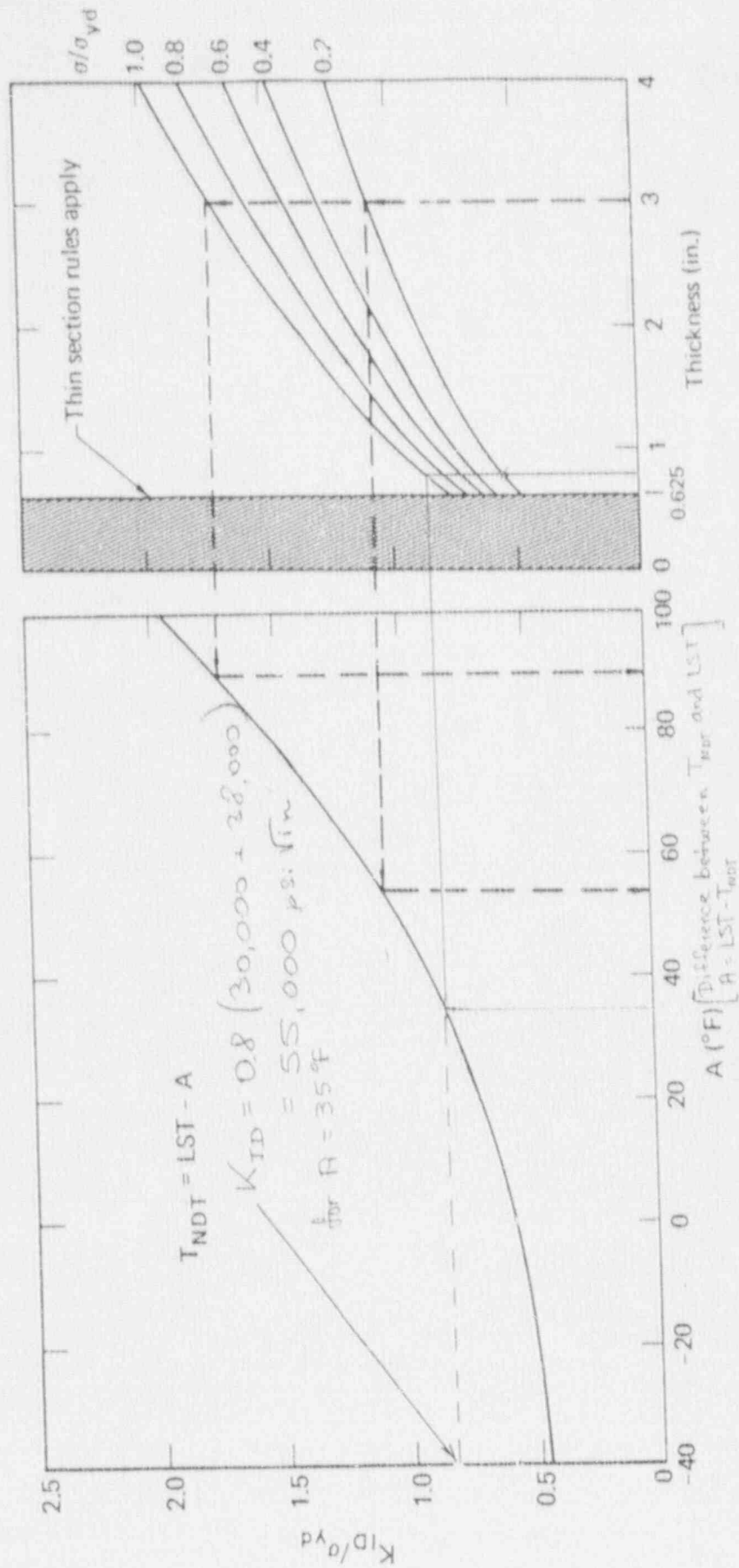
and (from Figure 2) the test temperature of 2.5°F is 35° above the NDT temperature of material (which is then -32.5°F).

Therefore, in both cases the results are the same: the NDT is -32.5°F. PSN specified 12.6 lb•ft at -30°; however, we would achieve the same purpose if we required 25 lb•ft at 2.5°. At the same time, the NRC suggested requirement of 25 lb•ft at -30° would require NDT of -30° - 35° = -65° which is not necessary.

If the NRC staff wishes, PSN can change the Charpy requirement to 25 lb•ft at 2°F.

Comment 2

PSN has responded to this comment by the FAX of September 14, 1996. Once again, based on the previous NRC licensing actions, we do not believe that the pressurization accident should be considered during the transfer operations due to the short-lasting temporary nature of the transfer. This load combination should not have been included in Table 2.2-4 of the TR. Nevertheless, as discussed in the referenced FAX, the increase of pressure by 14% has no impact on the MSB adequacy because the stresses are two times



NOTE: From above for our $LST = 2.5^\circ\text{F}$ we get $NDT = -32.5^\circ\text{F}$

FIG. 3. Design chart for Category I fracture critical components.

used for fabricating the structure. Welding procedures should be cited as part of the design and fabrication specifications.

All welds for Categories I and II should be inspected and repaired as necessary in accordance with the requirements of Sec. III, Class I and II respectively, of the ASME Pressure Vessel Code.

4.2 TESTING METHODS

The AAR guidelines procedures for fracture-safe design of steel structures are based on the Design Reference K_{ID} Curve (see Fig. 2), which is a lower bound curve relating fracture toughness to temperature relative to NDT. Our use of this curve will be limited to structural steels having minimum specified static yield strength no greater than 100 ksi. Using this curve, toughness requirements expressed in fracture mechanics terms can be converted to the reference temperature (or temperature relative to NDT) at which the steel has at least this required level of toughness. Conversely, if the NDT

temperature of a steel is known, the curve gives the minimum toughness of that steel as a function of temperature. Fracture toughness and NDT are therefore directly related by the curve, and the toughness-temperature relationship can be established by measuring or specifying the NDT. This indirect method is used because there are currently no standard methods for measuring dynamic fracture toughness K_{ID} . The AAR Guidelines³ and Manual⁸ also provide a procedure to develop a K_{ID} curve for a specific steel using Charpy V-notch data. The following relationship⁹ must be used if a K_{ID} curve is constructed from Charpy data:

$$K_{ID}^2 = 5(C_V)E$$

where

K_{ID} = dynamic fracture toughness in $ksi\sqrt{in}$
 E = modulus of the steel in psi
 C_V = Charpy V-notch measurement in ft-lb.

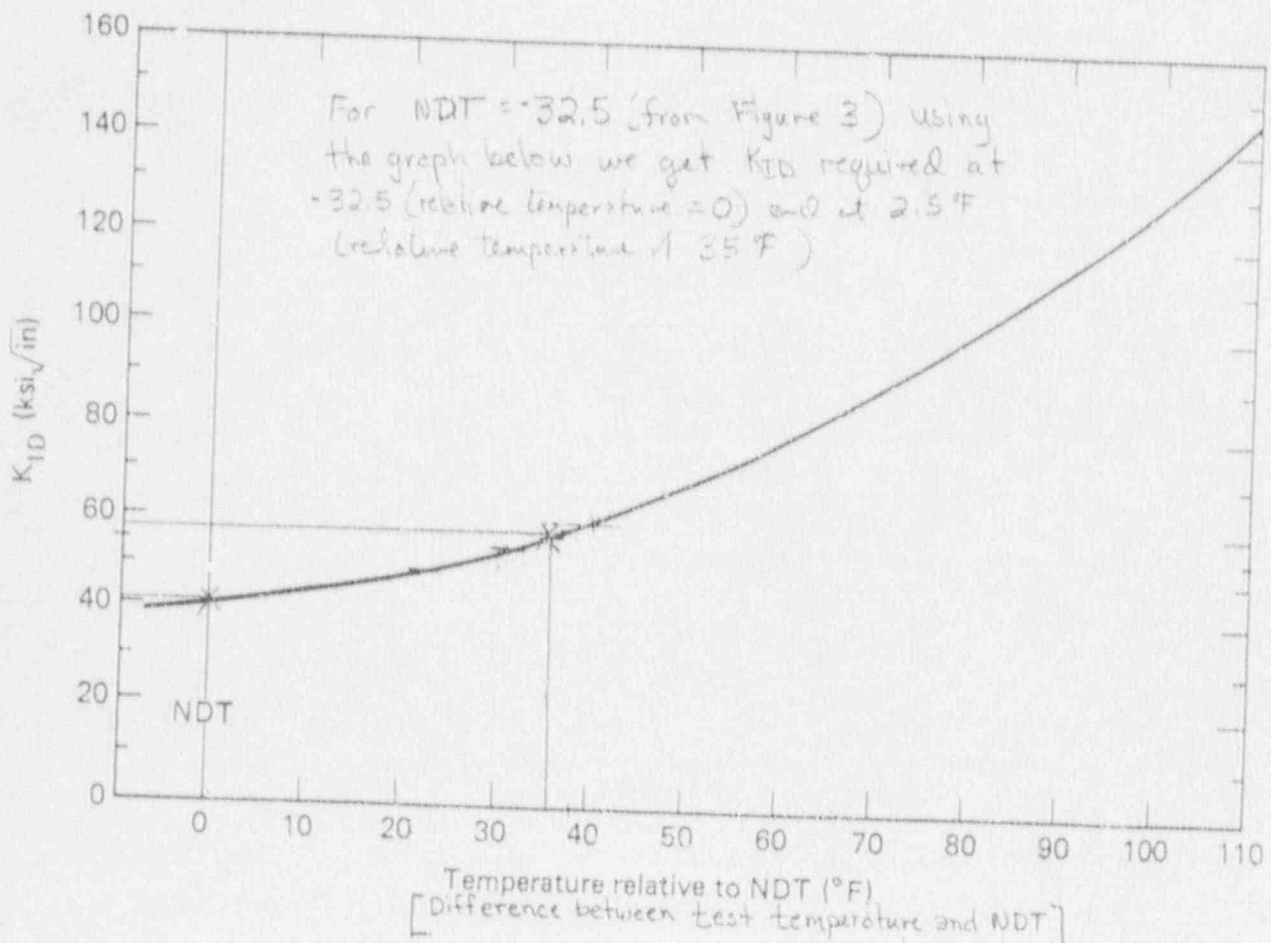


FIG. 2. Design-reference curve relating K_{ID} and the temperature relative to NDT (from Ref. 3).

below allowables. PSN will change Table 11.2-3 as directed: to remove this load combination or to include the maximum hypothetical accident pressure.

Comment 3

A ΔT of 310°F between nodes 81 and 83 is maintained due to the conductivity of the heated region of 2.4 BTU/hr/ft. The conductivity of the steel bottom is 26 BTU/hr/ft which is higher by the order of magnitude. Thus, the ΔT in the bottom plate will be lower accordingly.

Nevertheless, PSN has estimated the thermal stresses in the MSB bottom assuming the ΔT between the center and the edge to be 310°F. The analysis has been done using Edition IV of Roark, Chapter 15, Article 88, case 12. The obtained maximum stress intensity of 20.5 ksi is well within the allowable of 63.5 ksi even after adding all other loads. Please see Table 3.4-5 of the TR for the bottom plate margin.

Comment 4

Enclosed please find the requested printout. We have also included the membrane stresses so that the NRC staff could make sure that this is the output from the same run. Please note that essentially no bending is present in the sleeve walls. This is because each sleeve bends over its length without significant distortion of the section, thus, bending stresses are insignificant and membrane stresses are dominant.

Comment 5

PSN contacted American Drill Bushing Company. The hoist rings high alloy, Q&T 4140 steel has S_u of 180 ksi and S_y of 160 ksi. Thus, the ultimate strength is controlling. The safety factor for yield will be

$$K_y = 5 (160/180) = 4.4 > 3$$

Furthermore, in accordance with Figure 1 of the NUREG/CR-1815 (attached) the conservative NDT temperature for this steel is below -80°F.

Comment 6

The MTC is always operated inside the Auxiliary Building where the temperature is at least 50°F. The specification of this temperature will be added to Section 12.0 of the Topical Report. This is well above the temperature at which the brittle fracture could be a concern. The NDT temperature range for the ASTM 588 steel is -70°F to -10°F.

PRINT , PRIN NODAL STRESSES PER NODE

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
1	23.036260	0.00000000E+00	-18.393518	41.429778	35.954
2	22.325522	0.00000000E+00	-17.175123	39.500645	34.307
3	20.621983	0.00000000E+00	-13.226616	33.848409	29.549
4	19.245927	0.00000000E+00	-13.408023	32.653950	28.429
5	17.488201	0.00000000E+00	-8.8037036	26.291905	23.189
6	14.410355	0.00000000E+00	-2.2939841	16.704340	15.685
7	12.245986	0.00000000E+00	-2.6689768	14.914962	13.780
8	9.4458213	0.83676965	-0.68821710	10.134038	9.4647
9	10.263680	1.9690194	0.00000000E+00	10.263680	9.4357
10	18.309522	0.00000000E+00	-11.722169	30.031692	26.218
11	18.053108	0.00000000E+00	-11.806946	29.860054	26.049
12	10.676930	0.90158159E-01	0.00000000E+00	10.676930	10.632
13	10.774978	0.13490401	0.00000000E+00	10.774978	10.708

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LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
14	12.311572	6.4582925	0.00000000E+00	12.311572	10.666
15	16.976885	0.00000000E+00	-7.5927526	24.569637	21.789
16	14.939918	0.00000000E+00	-7.9263646	22.866282	20.126
17	12.855001	0.00000000E+00	-2.2670941	15.122095	14.132
18	10.662614	3.7862180	0.00000000E+00	10.662614	9.3787
19	10.812242	3.4477589	0.00000000E+00	10.812242	9.005
20	17.499333	7.6721227	0.00000000E+00	17.499333	15.621
21	29.389142	4.8749223	0.00000000E+00	29.389142	27.475
22	13.345514	0.00000000E+00	-8.1130756	21.458589	18.766
23	12.992079	0.00000000E+00	-2.2437826	15.235861	14.253
24	15.292013	4.8467238	0.00000000E+00	15.292013	13.536
25	17.556925	6.8244949	-0.46135973E-01	17.603061	16.782
26	33.901838	0.00000000E+00	-0.44820526	34.350044	34.128

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LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
27	5.2439097	0.00000000E+00	-20.329349	25.573259	23.456
28	5.0297209	0.00000000E+00	-19.110294	24.140015	22.116
29	4.3426708	0.00000000E+00	-15.024251	19.366921	17.662
30	3.8007037	0.00000000E+00	-15.148576	18.949280	17.406
31	3.7222759	0.00000000E+00	-10.777760	14.500036	13.073
32	3.2441574	0.00000000E+00	-3.8718391	7.1159965	6.1993
33	2.6851691	0.00000000E+00	-3.9930763	6.6782455	5.8378
34	4.8206675	0.00000000E+00	-3.9835624	8.8042300	7.7442

35	8.2071143	1.0565362	-2.0038260	10.210940	9.3061
36	3.1585641	0.00000000E+00	-13.358675	16.517239	15.236
37	2.8879147	0.00000000E+00	-13.451975	16.339889	15.154
38	1.2132850	0.00000000E+00	-0.43049747	1.6437825	1.5111
39	1.3480587	0.00000000E+00	-0.36003150	1.7080902	1.5946

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LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
40	8.5970507	1.9756523	-3.9263947	12.523445	10.920
41	2.5582815	0.00000000E+00	-9.2810900	11.839371	10.842
42	1.8224912	0.00000000E+00	-9.5519609	11.374452	10.621
43	3.1392589	0.00000000E+00	-3.9952174	7.1344762	6.2160
44	6.1148160	0.34202907	-0.14090503	6.2557211	6.0451
45	6.0215089	0.00000000E+00	-1.5169466	7.5384555	6.9240
46	14.802965	0.56929184	-1.1112427	15.914208	15.189
47	16.990912	3.0746568	-0.59983789	17.590750	16.303
48	1.5509559	0.00000000E+00	-9.6487513	11.199707	10.521
49	3.2168332	0.00000000E+00	-3.9377681	7.1546013	6.2309
50	8.2453254	2.4853955	0.00000000E+00	8.2453254	7.4531
51	15.922650	3.6416367	0.00000000E+00	15.922650	14.451
52	21.376323	6.4322322	0.00000000E+00	21.376323	19.787

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LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
53	9.4706195	3.3455735	0.00000000E+00	9.4706195	8.3187
54	6.7468014	1.9824490	0.00000000E+00	6.7468014	6.0062
55	2.5089051	0.00000000E+00	-4.0815542	6.5904592	5.7661
56	0.63595844	-0.76920673	-6.4440704	7.0800288	6.5009
57	0.30530241	-2.0694195	-26.025427	26.330730	25.261
58	0.33256218	-1.9090423	-24.669221	25.001784	23.988
59	0.38321587	-1.6304468	-19.823112	20.206328	19.299
60	0.29113289	-1.4886743	-19.802281	20.093414	19.288
61	0.67041899	-0.54872970	-15.072316	15.742735	15.178
62	1.4274761	-0.79337569	-6.5891549	8.0166310	7.2120
63	1.0347945	-0.80357815	-5.6479715	6.6827660	6.0228
64	4.6030518	0.00000000E+00	-4.6621347	9.2651864	8.1177
65	6.9872916	1.0860871	-1.4121931	8.3994847	7.5631

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LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
66	0.10984783	-1.6808249	-17.533664	17.643512	16.864
67	0.00000000E+00	-1.9159844	-17.645023	17.645023	16.827
68	0.26295021	-0.51141961E-01	-4.0405963	4.3035465	4.1636
69	0.27013443	-0.45646623E-01	-3.9733299	4.2514643	4.1075
70	10.392736	0.00000000E+00	-9.4128086	19.805545	17.358

71	0.00000000E+00	-1.7036633	-12.873843	12.873843	12.175
72	0.00000000E+00	-2.0825043	-13.111791	13.111791	12.244
73	1.4939148	0.00000000E+00	-6.8527933	8.3467082	7.7251
74	8.2462489	0.00000000E+00	-4.0328645	12.279113	10.910
75	7.8353024	0.00000000E+00	-6.8338885	14.669191	12.724
76	16.719046	0.27491482	-3.0152480	19.734294	18.374
77	12.804723	2.2103725	-0.21678709	13.021510	12.017
78	0.00000000E+00	-1.9142734	-13.118223	13.118223	12.294

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
79	1.6579095	0.00000000E+00	-6.6798455	8.3377550	7.6640
80	9.5544044	0.00000000E+00	-4.4896266	14.044031	12.630
81	15.352709	0.00000000E+00	-9.7331595	25.085868	21.943
82	14.763732	6.0260309	-6.0740347	20.837767	18.143
83	9.1764465	0.75350095	0.00000000E+00	9.1764465	8.8284
84	6.4607437	0.00000000E+00	-2.7615656	9.2223093	8.2696
85	0.46601186	-0.88184844	-7.4292667	7.8952785	7.3480
86	0.47338628	-1.5330102	-9.5418736	10.015260	9.2781
87	0.00000000E+00	-2.4989877	-33.213935	33.213935	32.080
88	0.99484987E-02	-2.2251578	-31.460760	31.470708	30.457
89	0.21632204	-1.5985191	-25.368862	25.585184	24.754
90	0.24238928	-1.4328836	-25.071817	25.314206	24.537
91	0.77329462	-0.80676204	-18.159604	18.932899	18.201

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
92	2.1417946	0.00000000E+00	-6.5924840	8.7342786	7.9086
93	1.5527286	0.00000000E+00	-4.9347572	6.4874858	5.8849
94	5.7466447	0.77821549E-01	-2.3572637	8.1039084	7.3061
95	18.591880	1.5757600	-0.71485008	19.306730	18.375
96	0.13871658	-1.4533060	-22.450967	22.589684	21.862
97	0.00000000E+00	-1.7651313	-22.585234	22.585234	21.794
98	1.2287524	0.00000000E+00	-0.91993781	2.1486902	1.9112
99	1.2880351	0.00000000E+00	-0.84102135	2.1290565	1.9037
100	21.216172	2.9741574	-3.6540816	24.870254	22.344
101	0.00000000E+00	-1.5895299	-16.221141	16.221141	15.541
102	0.00000000E+00	-2.1531485	-16.196391	16.196391	15.277
103	1.5733057	0.00000000E+00	-6.8163520	8.3896577	7.7663
104	11.087037	0.00000000E+00	-1.4424442	12.529481	11.879

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
105	10.708841	0.00000000E+00	-3.1572368	13.866078	12.626
106	22.691207	0.83693288	-1.4103907	24.101598	23.093

107	26.542477	4.3160484	-0.16351984	26.705997	25.146
108	0.00000000E+00	-1.9667492	-15.899054	15.899054	15.044
109	1.7446176	0.00000000E+00	-6.6734117	8.4180294	7.7370
110	13.110039	2.1070878	-0.24794373E-01	13.134833	12.350
111	21.126763	2.6414075	0.00000000E+00	21.126763	20.022
112	25.955093	6.7277912	-0.63378720	26.588880	25.104
113	12.969683	7.5939784	0.00000000E+00	12.969683	11.286
114	5.6924604	2.3064498	0.00000000E+00	5.6924604	5.0030
115	0.72971957	0.00000000E+00	-5.3200660	6.0497856	5.7221
116	0.16943398E-01	-1.0043287	-6.6059019	6.6228453	6.2801
117	0.17630480E-01	-1.1239131	-38.846054	38.863684	38.316

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
118	0.18153375	-1.0196442	-36.689679	36.871212	36.292
119	0.73021446	-0.48869785	-29.592053	30.322267	29.740
120	0.80616634	-0.40501294	-29.080397	29.886563	29.302
121	1.2097871	-0.22093612	-20.010052	21.219839	20.555
122	3.2551376	0.00000000E+00	-5.5875444	8.8426819	7.8524
123	2.8731595	0.00000000E+00	-4.2726908	7.1458502	6.2893
124	9.6684013	0.37541264E-01	-0.41637642	10.084778	9.8700
125	25.975795	0.19488230	-0.33775532	26.313550	26.052
126	0.82400318	-0.29743354	-26.266367	27.090370	26.552
127	0.56068935	-0.56444449	-26.421185	26.981874	26.437
128	2.0713731	0.65046636	0.00000000E+00	2.0713731	1.8963
129	2.1519621	0.73382054	0.00000000E+00	2.1519621	1.9540
130	35.204220	4.2333744	0.00000000E+00	35.204220	33.306

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
131	0.57764917	-0.54136857	-18.737317	19.314966	18.780
132	0.18145509	-0.97144645	-18.458171	18.639626	18.101
133	2.2119345	0.00000000E+00	-5.8632689	8.0752034	7.2678
134	13.669447	0.78181505	-0.18707235	13.856519	13.408
135	13.751369	0.00000000E+00	-1.3637763	15.115145	14.487
136	32.570785	1.7444111	0.00000000E+00	32.570785	31.740
137	44.623599	2.3999634	-1.9199001	46.543499	44.558
138	0.11250252	-0.82651350	-17.893674	18.006176	17.565
139	2.4977345	0.00000000E+00	-5.7092105	8.2069450	7.3303
140	15.720141	3.8476912	0.00000000E+00	15.720141	14.199
141	30.087890	0.43638242	-0.40174084	30.489631	30.081
142	37.512654	0.00000000E+00	-4.1333561	41.646010	39.758
143	0.00000000E+00	-1.6243778	-42.083949	42.083949	41.298

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
144	0.00000000E+00	-1.3933113	-39.678518	39.678518	39.004
145	0.30274640	-0.57615717	-32.045660	32.348406	31.922
146	0.25785980	-0.38073406	-31.521920	31.779780	31.466
147	0.54085945	-0.26622495	-21.300328	21.841188	21.454
148	2.7379992	0.00000000E+00	-5.5446169	8.2826161	7.4900
149	3.1392217	0.00000000E+00	-4.7945026	7.9337243	7.0084
150	10.576161	0.15670707	-0.70642121	11.282583	10.880
151	29.594717	0.13028594	-0.33602413	29.930741	29.701
152	0.32147397	-0.26262849	-28.521653	28.843127	28.556
153	0.68251707E-01	-0.58799889	-28.689422	28.757673	28.437
154	2.2784519	0.72391478	-0.70724688E-01	2.5491766	2.0824
155	2.3732394	0.76250475	-0.59704147E-01	2.4329436	2.1569
156	38.476651	5.4659333	0.00000000E+00	38.476651	36.063

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1
SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
157	0.58222054E-01	-0.60359858	-20.392628	20.450850	20.133
158	0.00000000E+00	-1.4724559	-19.946337	19.946337	19.264
159	1.3529714	0.00000000E+00	-5.6910641	7.0440355	6.5308
160	13.918209	1.3279985	-0.66918923E-01	13.985128	13.374
161	14.620606	0.25343386E-01	-1.0076546	15.628261	15.152
162	35.715505	2.3191702	0.00000000E+00	35.715505	34.627
163	51.890988	2.8101817	-1.7752854	53.666274	51.564
164	0.00000000E+00	-1.4010556	-19.203662	19.203662	18.549
165	1.7046643	0.00000000E+00	-5.5320397	7.2367040	6.6093
166	16.545653	4.8114628	0.00000000E+00	16.545653	14.766
167	32.949247	0.92469387	-1.0216598	33.970907	33.047
168	44.594532	0.00000000E+00	-5.2827348	49.877266	47.535
169	0.00000000E+00	-1.8739850	-43.413197	43.413197	42.507

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1
SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
170	0.00000000E+00	-1.8252529	-40.901702	40.901702	40.020
171	0.47365649E-02	-0.96989978	-33.029041	33.033778	32.565
172	0.00000000E+00	-1.1066647	-32.563821	32.563821	32.027
173	0.00000000E+00	-1.3437895	-22.007077	22.007077	21.368
174	1.4385264	-0.54979286	-6.2314035	7.6699299	6.9502
175	1.7611366	-0.19140436	-5.5416131	7.3027497	6.5941
176	6.6305428	0.00000000E+00	-2.0285194	8.6590622	7.9852
177	24.137603	2.7931391	-1.1670388	25.304641	23.971
178	0.00000000E+00	-0.86276606	-29.427228	29.427228	29.006
179	0.00000000E+00	-1.4549797	-29.602907	29.602907	28.903
180	1.1298310	0.15154161	-0.31400322	1.4438342	1.3116
181	1.2827493	0.17819089	-0.28542195	1.5681713	1.4217
182	26.796769	3.9066670	-5.4452494	32.242019	28.780

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1

TIME= 0.00000E+00 LOAD CASE= 1
SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
183	0.00000000E+00	-1.6502561	-21.120924	21.120924	20.347
184	0.00000000E+00	-2.8552542	-20.605537	20.605537	19.352
185	0.00000000E+00	-0.72813337	-5.9725902	5.9725902	5.6522
186	12.335179	0.46745667	-0.32517720	12.660656	12.286
187	12.731801	0.00000000E+00	-2.5663023	15.298103	14.210
188	29.096780	1.2113369	-1.5685261	30.665306	29.427
189	36.182376	5.4813013	-0.49337960	36.675756	34.478
190	0.00000000E+00	-3.0541287	-19.783459	19.783459	18.448
191	0.47933116E-01	-0.47947307	-5.9340323	5.9819654	5.7401
192	14.915074	5.5287278	0.00000000E+00	14.915074	13.236
193	27.449189	5.6875442	0.00000000E+00	27.449189	25.135
194	36.033056	10.148483	-0.12541704	36.158473	34.018
195	18.932062	9.4888431	0.00000000E+00	18.932062	16.395

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1
SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
196	11.629754	3.4174435	0.00000000E+00	11.629754	10.357
197	3.2099341	0.00000000E+00	-7.4076408	10.617575	9.4317
198	0.69030561	-1.3611776	-9.8841419	10.574447	9.7674
199	0.00000000E+00	-3.9951609	-43.750872	43.750872	41.896
200	0.00000000E+00	-4.0311734	-41.220167	41.220167	39.359
201	0.00000000E+00	-3.2957944	-33.276827	33.276827	31.764
202	0.00000000E+00	-3.6389088	-32.821640	32.821640	31.166
203	0.00000000E+00	-4.2885535	-22.255481	22.255481	20.452
204	0.00000000E+00	-3.8920513	-6.7808510	6.7808510	5.8955
205	0.00000000E+00	-3.6169296	-5.9825806	5.9825806	5.2188
206	4.4361024	0.00000000E+00	-3.7136478	8.1497502	7.2027
207	11.470247	2.1004788	-1.0884180	12.558665	11.357
208	0.00000000E+00	-3.3704729	-29.645931	29.645931	28.112

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1
SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
209	0.00000000E+00	-3.9618342	-29.824325	29.824325	28.054
210	0.25083662	-0.42850632	-6.3495526	6.6003892	6.2928
211	0.24853189	-0.40276646	-6.2339602	6.4824921	6.1865
212	19.215387	0.00000000E+00	-13.774790	32.990177	28.711
213	0.00000000E+00	-4.2985688	-21.227074	21.227074	19.437
214	0.00000000E+00	-5.7463499	-20.730971	20.730971	18.571
215	0.00000000E+00	-3.9265621	-6.2375371	6.2375371	5.5131
216	11.294677	0.00000000E+00	-5.3429722	16.637650	14.882
217	11.295576	0.00000000E+00	-10.237593	21.533169	18.656
218	26.339637	0.00000000E+00	-3.7541219	30.093759	28.500
219	21.705513	3.0022201	0.00000000E+00	21.705513	20.387
220	0.00000000E+00	-6.0507993	-19.881899	19.881899	17.652
221	0.00000000E+00	-3.3667143	-5.7151229	5.7151229	5.0233

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
222	13.406255	0.17728717	-5.8746477	19.280903	17.491
223	24.084202	0.00000000E+00	-15.568575	39.652777	34.604
224	23.290680	9.3192114	-9.6815741	32.972254	28.667
225	17.468941	0.63728345	0.00000000E+00	17.468941	17.159
226	12.240731	0.00000000E+00	-4.5045114	16.745243	15.085
227	1.0631251	-1.2382916	-11.758662	12.821787	11.859
228	0.85229700	-2.3401742	-15.030099	15.882396	14.690
229	0.00000000E+00	-2.3143889	-43.535341	43.535341	42.425
230	0.00000000E+00	-2.2425669	-41.047965	41.047965	39.974
231	0.00000000E+00	-1.3270153	-33.235208	33.235208	32.600
232	0.00000000E+00	-1.4410510	-32.752966	32.752966	32.059
233	0.00000000E+00	-1.6353197	-22.219189	22.219189	21.449
234	1.3916634	-0.67002621	-6.4681968	7.8598602	7.0962

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
235	1.6557357	-0.23881221	-5.7593734	7.4151091	6.7113
236	6.3883878	0.00000000E+00	-2.1762837	8.5646715	7.8431
237	23.315822	2.7558888	-1.1634803	24.979302	23.664
238	0.00000000E+00	-1.2164635	-29.643903	29.643903	29.055
239	0.00000000E+00	-1.8106843	-29.820358	29.820358	28.957
240	1.0063762	0.66072796E-01	-0.47808695	1.4844631	1.3632
241	1.1628126	0.68900519E-01	-0.42824428	1.5910569	1.4670
242	26.326206	3.4889421	-5.8676149	32.193821	28.778
243	0.00000000E+00	-2.0293816	-21.261279	21.261279	20.323
244	0.00000000E+00	-3.4899146	-20.865142	20.865142	19.384
245	0.00000000E+00	-1.5589892	-6.4463257	6.4463257	5.8309
246	11.872630	0.68275852E-01	-0.39834841	12.271028	12.049
247	12.446666	0.00000000E+00	-2.8486309	15.295297	14.109

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
248	29.390185	1.0071759	-1.5919050	30.982090	29.831
249	36.248659	5.4844043	-0.50341305	36.752072	34.555
250	0.00000000E+00	-2.9033531	-18.362923	18.362923	17.102
251	0.30562260	-0.46403740	-4.8460565	5.1516791	4.8266
252	16.238380	5.5742286	0.00000000E+00	16.238380	14.433
253	28.192826	5.5408112	0.00000000E+00	28.192826	25.914
254	36.295177	10.238544	-0.16771240	36.462889	34.309
255	19.142476	9.9298296	0.00000000E+00	19.142476	16.581
256	11.468365	3.4190569	0.00000000E+00	11.468365	10.201
257	3.1711580	0.00000000E+00	-7.4098592	10.581017	9.4054
258	0.62591767	-1.4003144	-10.088503	10.714420	9.9227

259	0.00000000E+00	-2.2146717	-41.971016	41.971016	40.911
260	0.00000000E+00	-1.9362966	-39.655302	39.655302	38.727

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
261	0.28936350	-0.82158589	-32.232177	32.521541	31.987
262	0.15486411	-0.44508632	-31.713780	31.71644	31.575
263	0.44823612	-0.34922075	-21.732388	22.0624	21.800
264	2.8492875	0.00000000E+00	-6.0495866	8.8988741	8.0634
265	3.3441261	0.00000000E+00	-5.2337776	8.5779038	7.5753
266	10.207960	0.10636020E-01	-0.77049833	10.978458	10.618
267	29.276170	0.30933363	-0.31862474	29.594794	29.287
268	0.38110821	-0.18173499	-28.687548	29.068656	28.793
269	0.13442685	-0.51856189	-28.855623	28.990049	28.670
270	2.3568570	0.59683776	-0.15729254	2.5141495	2.2395
271	2.4620051	0.62131580	-0.14561697	2.6076220	2.3256
272	37.562441	5.1784714	0.00000000E+00	37.562441	35.266
273	0.22255722	-0.45164534	-20.678847	20.901404	20.573

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
274	0.00000000E+00	-2.3019239	-20.437493	20.437493	19.454
275	0.36587729	-6.69989449	-6.4611723	6.8270496	6.3826
276	13.219056	0.37465645	-0.51247520E-02	13.224181	13.039
277	14.259770	0.12958869	-0.78078275	15.040553	14.612
278	36.069118	2.5840026	0.00000000E+00	36.069118	34.822
279	52.090234	2.9005199	-1.6275369	53.717771	51.646
280	1.4563199	0.00000000E+00	-16.501105	17.957425	17.284
281	4.6014050	0.00000000E+00	-3.8456487	8.4470537	7.3942
282	18.401182	6.4484525	0.00000000E+00	18.401182	16.42
283	33.688280	1.1700914	-1.0014442	34.689724	33.662
284	45.179886	0.00000000E+00	-5.2485981	50.428484	48.093
285	0.00000000E+00	-3.9141015	-37.743995	37.743995	35.960
286	0.00000000E+00	-3.4483911	-35.872042	35.872042	34.297

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
287	0.73026704E-01	-2.0375234	-29.266842	29.339868	28.370
288	0.38435689E-01	-1.5472185	-28.817127	28.815563	28.120
289	0.73841002	-1.0070872	-20.801344	21.539754	20.737
290	2.7130602	0.00000000E+00	-6.7419135	9.4549736	8.5405
291	2.5762636	0.00000000E+00	-5.2760778	7.8523414	6.9785
292	9.5207694	0.00000000E+00	-2.0111526	11.531922	10.725
293	24.464516	0.63427133E-01	-0.50550648	24.970022	24.691
294	0.64875820E-01	-1.4135754	-25.866356	25.931231	25.243

295	0.00000000E+00	-1.8788593	-26.021779	26.021779	25.158
*296 *	1.8081393	0.76768924E-01	-0.12341626	1.9315555	1.8415
297	1.8780414	0.11089939	-0.54689824E-01	1.9327312	1.8591
298	33.610120	3.6779548	0.00000000E+00	33.610120	31.956
299	0.00000000E+00	-1.6031481	-18.667088	18.667088	17.957

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
300	0.00000000E+00	-2.3933542	-18.532614	18.532614	17.499
301	1.7055293	-0.20899288	-7.0470306	8.7525599	8.0106
302	13.772397	0.00000000E+00	-0.85085275	14.623250	14.221
303	13.949930	0.00000000E+00	-2.6822100	16.632140	15.481
304	32.294489	0.77512301	-0.21238500	32.506874	32.025
305	43.308890	2.0782382	-1.9566630	45.265553	43.400
306	0.00000000E+00	-1.4897809	-16.609104	16.609104	15.935
307	2.6190540	0.00000000E+00	-5.5233348	8.1423888	7.2468
308	16.803102	2.6213984	0.00000000E+00	16.803102	15.674
309	30.263979	0.18203281	-0.66472808	30.928707	30.516
310	36.840807	0.00000000E+00	-4.0552186	40.896026	39.034
311	0.00000000E+00	-4.8210340	-29.585550	29.585550	27.547
312	0.00000000E+00	-4.0237235	-28.564867	28.564867	26.865

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
313	0.00000000E+00	-2.7133869	-23.590562	23.590562	22.447
314	0.41822406	-2.4142232	-23.526257	23.944481	22.696
315	1.9020970	-0.97593155	-19.347161	21.249258	20.010
316	3.1318440	0.00000000E+00	-8.5150824	11.646926	10.479
317	2.5292680	0.00000000E+00	-6.4649558	8.9942237	8.0548
318	5.8615554	0.00000000E+00	-4.9842769	11.645832	10.437
319	17.015870	1.2618808	-1.4188141	18.434684	17.468
320	0.11817583	-2.4508767	-20.719714	20.837890	19.735
321	0.14980350E-01	-2.7856974	-20.856470	20.871450	19.693
322	1.1986039	0.00000000E+00	-1.5113925	2.7099964	2.3870
323	1.2540565	0.00000000E+00	-1.4362114	2.6902679	2.3676
324	19.346371	2.8235304	-3.5715952	22.917966	20.535
325	0.22530908	-2.0978479	-15.696952	15.922261	14.975

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
326	0.24176556	-2.0906474	-15.963787	16.205552	15.255
327	3.2870168	0.00000000E+00	-8.7018516	11.988868	10.820
328	11.842974	0.00000000E+00	-2.7343096	14.577284	13.439
329	11.454701	0.00000000E+00	-4.4028052	15.857507	14.242
330	22.470327	0.63399668	-2.2854335	24.755760	23.474

331	24.483802	4.1513974	-0.20818413	24.691986	23.221
332	0.57356135	-1.5366443	-15.988920	16.562481	15.634
333	3.6754106	0.00000000E+00	-8.2637561	11.939167	10.644
334	14.136817	0.99491606	-1.1153164	15.252133	14.373
335	20.824190	1.4525459	-0.75855062	21.582741	20.606
336	24.197414	5.6566039	-1.2681025	25.465516	24.100
337	11.252285	6.2968148	0.00000000E+00	11.252285	9.7678
338	4.2307071	1.3016425	0.00000000E+00	4.2307071	3.8119

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.000000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
339	0.00000000E+00	-0.41922144	-4.9046813	4.9046813	4.7100
340	0.00000000E+00	-1.6382163	-6.6613586	6.6613586	6.0822
341	0.00000000E+00	-4.2743210	-17.555943	17.555943	15.985
342	0.62973039	-3.4415717	-17.964019	18.593749	17.009
343	0.73682326	-2.9335320	-15.354314	16.091137	14.675
344	1.2093844	-2.3838713	-15.903116	17.112500	15.746
345	3.9578119	-0.19803758	-16.400216	20.358028	18.778
346	3.6896644	-0.58032591	-9.6350414	13.324706	11.887
347	2.7249743	-0.58230903	-7.8024133	10.527388	9.4048
348	6.7082891	0.00000000E+00	-8.4848922	15.193181	13.237
349	6.7613351	0.29765462	-3.9100553	10.671390	9.4379
350	0.49999362	-3.0400640	-13.683526	14.183519	12.875
351	0.43635305	-3.2743934	-13.824569	14.260923	12.912

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.000000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
352	0.48992609	-0.62309174E-01	-5.3458228	5.8357488	5.5838
353	0.49964791	-0.49033636E-01	-5.3013626	5.8010105	5.5511
354	6.1959466	-0.64380230E-02	-9.8453254	16.041272	14.716
355	1.1443480	-1.9568669	-12.381985	13.526333	12.281
356	1.4713440	-1.3963691	-13.314606	14.785950	13.617
357	5.1072636	0.00000000E+00	-10.237930	15.345194	13.581
358	8.3269900	0.00000000E+00	-6.2341452	14.561135	12.744
359	7.7580500	0.00000000E+00	-8.2316291	15.989679	13.937
360	14.926037	0.41722275	-4.8404736	19.766511	17.946
361	9.7817866	2.1260868	-0.53378194	10.315569	9.2975
362	1.9951899	-0.63873515	-13.907247	15.902436	14.816
363	5.2157370	0.00000000E+00	-10.082479	15.298216	13.522
364	10.675240	0.00000000E+00	-7.2572813	17.932521	15.757

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.000000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
365	13.104108	0.00000000E+00	-9.3913120	22.495420	19.816
366	12.898294	5.5301688	-5.2311557	18.129449	15.907

367	6.2433151	0.48975502	-0.60013414	6.8434493	6.3741
368	4.1801884	0.00000000E+00	-2.8207149	7.0009033	6.2088
369	0.13216916	-1.0551801	-6.9336631	7.0658323	6.6271
370	0.27090396	-1.7693760	-8.7045117	8.9754157	8.2303
371	12.976530	0.00000000E+00	-5.9925584	18.969088	17.179
372	13.028195	0.00000000E+00	-6.3212700	19.349466	17.454
373	11.374086	0.00000000E+00	-5.3466214	16.720708	15.114
374	10.691955	0.00000000E+00	-6.0176043	16.709559	14.932
375	11.836553	0.00000000E+00	-6.8605721	18.697125	16.600
376	8.0969372	0.00000000E+00	-4.1373201	12.234257	10.868
377	5.8714511	0.00000000E+00	-3.6144686	9.4859197	8.3479

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
378	6.7318748	0.00000000E+00	-5.8202416	12.552116	10.984
379	5.8270581	0.00000000E+00	-4.3448103	10.171868	8.9982
380	9.1250728	0.00000000E+00	-5.1431286	14.268201	12.787
381	8.8638411	0.00000000E+00	-5.2161570	14.079998	12.605
382	3.1357971	0.00000000E+00	-1.6551469	4.7909440	4.2364
383	3.2419445	0.00000000E+00	-1.5895126	4.8314571	4.2871
384	1.7010934	0.00000000E+00	-4.7468357	6.4479290	6.0720
385	8.8565692	0.00000000E+00	-4.5695961	13.426165	12.040
386	8.2265362	0.00000000E+00	-5.4008673	13.627403	12.059
387	8.9339703	0.00000000E+00	-4.4536916	13.387662	11.909
388	6.5723285	0.00000000E+00	-2.2850053	8.8573337	8.0069
389	6.0890706	0.00000000E+00	-3.2177241	9.3067948	8.2349
390	9.6968154	0.00000000E+00	-2.4696935	12.166509	11.160

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
391	7.0291572	2.5698987	-0.91890452	7.9480617	7.0730
392	8.0164665	0.00000000E+00	-6.0250533	14.041520	12.306
393	9.0151335	0.00000000E+00	-4.4240147	13.439148	11.960
394	11.531771	0.00000000E+00	-2.6516196	14.183391	13.076
395	10.786851	0.42097482E-01	-2.0278637	12.814715	11.981
396	12.783967	3.1860825	-0.61680778	13.400774	12.166
397	9.9870038	0.10175434	0.00000000E+00	9.9870038	9.9365
398	5.4888531	2.0898759	0.00000000E+00	5.4888531	4.8018
399	1.8865072	0.00000000E+00	-3.8630694	5.7495766	5.0772
400	0.33730397	-0.99745295	-6.5473294	6.8846334	6.3778
401	35.446447	0.00000000E+00	-1.5736112	37.020058	36.258
402	33.468021	0.00000000E+00	-1.6584155	35.126437	34.330
403	30.750848	0.00000000E+00	-1.0708897	31.821738	31.300

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
404	27.402139	0.00000000E+00	-1.7013062	29.103446	28.295
405	21.272620	0.00000000E+00	-1.9216875	23.194307	22.326
406	18.033839	0.00000000E+00	-0.89691123	18.930750	18.506
407	13.967075	0.00000000E+00	-1.1319905	15.099066	14.603
408	7.4186145	0.00000000E+00	-1.9645119	9.3831264	8.6697
409	7.6345361	0.00000000E+00	-1.9799897	9.6145257	8.8074
410	27.343352	0.00000000E+00	-1.2175462	28.560898	27.975
411	27.041938	0.00000000E+00	-1.2409144	28.282852	27.686
412	15.065931	0.91314892E-01	-0.17098415	15.196915	15.087
413	15.123556	0.11136499	-0.11819326	15.241749	15.128
414	8.1138069	0.24935536	-0.73710933	8.8509162	8.4012
415	24.704129	0.00000000E+00	-0.63967654	25.343806	25.030
416	20.992742	0.00000000E+00	-1.4777648	22.470507	21.785

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT TOP

NODE	SIG1	SIG2	SIG3	SI	SI
417	15.750119	0.00000000E+00	-1.0311413	16.781260	16.314
418	12.697904	0.00000000E+00	-1.1116571	13.809561	13.290
419	10.500108	0.00000000E+00	-2.1434004	12.643508	11.766
420	8.5830989	0.00000000E+00	-0.42349194	9.0065908	8.8065
421	5.5623384	2.3165781	0.00000000E+00	5.5623384	4.8397
422	17.829017	0.00000000E+00	-2.1460702	19.975087	18.993
423	15.972067	0.00000000E+00	-1.0628609	17.034928	16.553
424	16.324052	0.00000000E+00	-1.2230422	17.547094	16.968
425	10.378862	0.00000000E+00	-2.2972847	12.676146	11.892
426	9.0637168	0.00000000E+00	-2.2268727	11.290589	10.358

MAXIMUMS

NODE	279	254	199	279	279
VALUE	52.090234	10.238544	-43.750872	53.717771	51.64

NODAL STRESSES ARE SHELL BOTTOM

PRINT PRIN NODAL STRESSES PER NODE

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
1	23.036260	0.00000000E+00	-18.393518	41.429778	35.954
2	22.325522	0.00000000E+00	-17.175123	39.500645	34.307
3	20.062045	0.00000000E+00	-13.334890	33.396935	29.127
4	18.678571	0.00000000E+00	-13.519871	32.198442	28.004
5	17.490269	0.00000000E+00	-8.8001718	26.290441	23.189
6	13.023332	0.00000000E+00	-2.5900939	15.673426	14.510
7	10.900086	0.00000000E+00	-2.9560573	13.856143	12.640
8	9.4465640	0.83826036	-0.68620310	10.132767	9.4636
9	10.972498	3.9015300	0.00000000E+00	10.972498	9.8241
10	18.307297	0.00000000E+00	-11.717641	30.024938	26.212
11	18.088154	0.00000000E+00	-11.797169	29.885323	26.074
12	10.986662	0.15512987	0.00000000E+00	10.986662	10.909

13 10.892441 0.10655711 0.00000000E+00 10.892441 10.839

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1
SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
14	11.347495	0.65759427	-1.9470464	13.294541	12.235
15	18.142091	0.00000000E+00	-7.3759941	25.478085	22.716
16	16.814366	0.00000000E+00	-7.4964637	24.310830	21.566
17	12.535962	0.00000000E+00	-2.2808089	14.816771	13.825
18	10.703160	3.7787100	0.00000000E+00	10.703160	9.4057
19	14.257169	4.6654436	0.00000000E+00	14.257169	12.601
20	15.700587	6.3630513	0.00000000E+00	15.700587	14.442
21	28.181772	0.73098620	-0.47941815	28.661190	28.076
22	15.977066	0.00000000E+00	-7.5113141	23.488380	20.777
23	12.866192	0.00000000E+00	-2.1350264	15.001218	14.061
24	11.777785	3.8291610	0.00000000E+00	11.777785	10.405
25	18.085562	6.5639124	0.00000000E+00	18.085562	17.110
26	35.028548	3.5336463	0.00000000E+00	35.028548	33.402

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1
SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
27	5.2439097	0.00000000E+00	-20.329349	25.573259	23.456
28	5.0297209	0.00000000E+00	-19.110294	24.140015	22.116
29	3.8195226	0.00000000E+00	-15.106177	18.925699	17.408
30	3.2715459	0.00000000E+00	-15.231764	18.503310	17.154
31	3.7236828	0.00000000E+00	-10.776513	14.500196	13.073
32	2.1554753	-0.19885923	-4.1419655	6.2974408	5.5945
33	1.6388433	-0.19396873	-4.2437059	5.8825492	5.2477
34	4.6219670	0.00000000E+00	-3.9834390	8.8054060	7.7450
35	6.7484041	0.71353681	-3.8295815	10.577986	9.7422
36	3.1858288	0.00000000E+00	-13.215758	16.401586	15.113
37	2.9558671	0.00000000E+00	-13.296406	16.252274	15.044
38	1.5055722	0.61732480E-01	-0.16910614	1.6746784	1.5939
39	1.3709296	0.27472289E-01	-0.20544299	1.5763726	1.4997

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1
SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
40	11.772464	2.2431676	-0.92868349	12.701148	11.593
41	3.7146609	0.00000000E+00	-8.7801314	12.494792	11.169
42	3.6636920	0.00000000E+00	-8.9030714	12.566763	11.233
43	2.9300935	0.00000000E+00	-4.2110841	7.1411775	6.2452
44	6.0812598	1.1319718	-0.78199315	6.8632530	6.1848
45	7.5947702	1.8191346	-0.82998725E-01	7.6777689	7.1091
46	14.871717	0.19361279	-1.6173232	16.489040	15.728
47	15.777790	0.78614994	-3.5571329	19.334923	17.881
48	4.1118671	0.00000000E+00	-8.8524890	12.964356	11.495

49	3.2724673	0.00000000E+00	-4.0175499	7.2900172	6.3540
50	5.4135227	0.54306095	-0.99587216	7.4093949	6.7910
51	15.736043	3.9052904	0.00000000E+00	15.736043	14.194
52	18.761316	4.4287334	-4.4826221	13.243938	20.658

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
53	5.3160725	0.00000000E+00	-1.6940654	7.0101379	6.3353
54	8.5920591	2.7574607	0.00000000E+00	8.5920591	7.6055
55	5.8150880	2.3822076	0.00000000E+00	5.8150880	5.0664
56	9.5243143	2.0455289	0.00000000E+00	9.5243143	8.6849
57	0.30530241	-2.0694195	-26.025427	26.330730	25.261
58	0.31256218	-1.9090423	-24.669221	25.001784	23.988
59	0.20520629	-2.0121291	-19.972471	20.177677	19.206
60	0.19260202	-1.9556719	-19.953540	20.146142	19.203
61	0.66970668	-0.54731137	-15.071475	15.741182	15.177
62	1.4274040	-1.7766013	-7.4640143	8.8914183	7.9970
63	1.0347585	-1.7702774	-6.5096044	7.5443628	6.7968
64	4.6041031	0.00000000E+00	-4.6615250	9.2656281	8.1185
65	4.9898038	0.00000000E+00	-7.5777603	12.567564	11.547

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
66	0.96223263E-01	-1.6845728	-17.500374	17.596597	16.822
67	0.00000000E+00	-1.8872433	-17.596520	17.596520	16.790
68	0.42218867	-0.58568030E-01	-3.7420503	4.1642470	3.9509
69	0.40826825	-0.63633509E-01	-3.8110184	4.2192866	4.0091
70	15.701473	0.80556790	0.00000000E+00	15.701473	15.324
71	0.49861958	-1.0521617	-12.433741	12.932361	12.233
72	0.61027594	-0.67741595	-12.285814	12.896090	12.325
73	1.3030188	0.00000000E+00	-7.1618212	8.4648400	7.9175
74	8.1242515	0.00000000E+00	-3.9499613	12.074213	10.689
75	9.1295345	0.00000000E+00	-3.0335447	12.163079	10.997
76	15.810516	0.00000000E+00	-4.9341011	20.744617	18.889
77	10.057903	0.00000000E+00	-6.8852681	16.943171	14.869
78	1.0770830	0.00000000E+00	-11.882466	12.959550	12.492

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
79	1.5708731	0.00000000E+00	-6.9198526	8.4907257	7.8464
80	7.8264900	0.00000000E+00	-9.1097769	16.936267	14.779
81	15.886686	0.00000000E+00	-8.9938620	24.880548	21.858
82	9.1204816	0.00000000E+00	-12.737540	21.858021	19.548
83	4.8739720	0.00000000E+00	-8.5428081	13.416780	11.822
84	5.6462058	0.00000000E+00	-2.6501760	8.2963818	7.3585

85	7.4260077	4.4292410	0.00000000E+00	7.4260077	6.5108
86	8.1884259	4.0426402	0.00000000E+00	8.1884259	7.0973
87	0.00000000E+00	-2.4989877	-33.213935	33.213935	2.0000
88	0.99484987E-02	-2.2251578	-31.460760	31.470708	30.457
89	0.38092313E-01	-2.0742295	-25.576076	25.614169	24.565
90	0.16752494	-2.0200185	-25.281758	25.449283	24.456
91	0.77202285	-0.80604964	-18.160040	18.932063	18.201

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
92	1.4002532	-0.91277333	-7.2351977	8.6354509	7.7965
93	0.82446773	-0.90111643	-5.5651888	6.3896565	5.7731
94	5.7458680	0.77916840E-01	-2.3584794	8.1043474	7.3065
95	16.843832	0.68760357	-3.3086717	20.152504	11.130
96	0.11299426	-1.4698548	-22.477041	22.590035	21.869
97	0.12351694E-01	-1.7593105	-22.593247	22.605598	21.810
98	1.2328815	0.00000000E+00	-0.64367643	1.8765579	1.7040
99	1.1733995	0.00000000E+00	-0.72239368	1.8957932	1.7069
100	21.424166	1.1485444	-0.21294654E-01	21.445461	20.896
101	0.61896890	-0.88844162	-15.796727	16.415625	15.717
102	0.83856133	-0.56353174	-15.306104	16.144666	15.515
103	1.4820401	-0.97119532E-01	-7.0318971	8.5139372	7.8721
104	11.011576	0.71824406	-2.0430891	13.054665	11.953

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
105	12.196296	1.5167768	-0.27531820	12.471614	11.695
106	22.289886	0.24041181	-2.5950852	24.984972	23.735
107	24.579035	1.1329545	3.8179061	28.396941	26.646
108	1.6825870	0.00000000E+00	-14.518327	16.200914	15.466
109	1.8237183	0.00000000E+00	-6.6991791	8.5228974	7.8255
110	11.065525	0.00000000E+00	-3.0013861	14.066911	12.945
111	20.930379	3.0650388	0.00000000E+00	20.930379	19.651
112	22.763089	4.7214730	-5.5773746	28.340464	25.469
113	8.5158749	0.00000000E+00	-1.7826845	10.298559	9.5330
114	8.0265089	2.4716546	0.00000000E+00	8.0265089	7.2689
115	9.3137911	2.0252803	0.00000000E+00	9.3137911	8.5022
116	10.637365	2.1375454	0.00000000E+00	10.637365	9.7550
117	0.17630480E-01	-1.1239131	-38.846054	38.863684	38.316

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
118	0.18153375	-1.0196442	-36.689679	36.871212	36.292
119	0.36889194	-0.85526887	-29.848847	30.217739	29.627
120	0.44114347	-0.77762798	-29.339626	29.780769	29.196

121	1.2085068	-0.22076973	-20.011413	21.219920	20.556
122	1.4714237	-0.18280427	-6.2679351	7.7393587	7.1055
123	1.1132368	-0.17383730	-4.9441626	6.0573994	5.5559
124	9.6685889	0.37146871E-01	-0.41646264	10.085052	9.6705
125	26.386390	1.1427657	-0.15363296	26.540022	26.962
126	0.78773761	-0.32576973	-26.354394	27.142132	26.607
127	0.56012607	-0.55530304	-26.486388	27.046514	26.507
128	2.1257739	0.79915861	0.00000000E+00	2.1257739	1.9675
129	2.0470264	0.71396293	0.00000000E+00	2.0470264	1.9095
130	32.921585	0.00000000E+00	-3.5863878	36.507973	34.854

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
131	1.4962963	0.00000000E+00	-18.344682	19.840978	19.161
132	2.0975572	-0.36344427E-01	-17.549310	19.646867	18.714
133	1.9112132	0.00000000E+00	-6.0775983	7.9888115	7.2721
134	13.555178	1.5023093	-0.86939754	14.424575	13.415
135	15.303069	3.5968859	0.00000000E+00	15.303069	13.872
136	32.103251	0.27518155	-0.28419766	32.387448	32.112
137	44.641584	1.8091052	-1.8614057	46.502990	44.806
138	3.6664743	0.00000000E+00	-16.424071	20.090545	18.550
139	2.4720666	0.00000000E+00	-5.8151453	8.2872119	7.4068
140	13.555221	0.00000000E+00	-2.5385732	16.093794	14.997
141	30.348412	0.73074352	-0.79196015E-01	30.427608	30.037
142	39.997057	3.5812470	0.00000000E+00	39.997057	38.335
143	0.00000000E+00	-1.6243778	-42.083949	42.083949	41.298

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
144	0.00000000E+00	-1.3933113	-39.678518	39.678518	39.004
145	0.00000000E+00	-1.0477975	-32.320987	32.320987	31.813
146	0.10652009	-1.0143667	-31.800167	31.906687	31.365
147	0.53987163	-0.26622930	-21.301609	21.841480	21.455
148	0.75635437	-0.16359584	-6.2726153	7.0289697	6.6453
149	1.1817209	-0.15475368	-5.5133362	6.6950571	6.1776
150	10.573978	0.15628265	-0.70639023	11.280369	10.878
151	29.889603	1.4431267	-0.11040682	30.000010	29.290
152	0.28388071	-0.29567814	-28.627246	28.911127	28.626
153	0.84203943E-01	-0.59494774	-28.770859	28.855063	28.523
154	2.3969483	0.81559491	-0.88481034E-01	2.4854293	2.2181
155	2.2947173	0.78396529	-0.99018515E-01	2.3937359	2.1453
156	34.834311	0.00000000E+00	-4.2870821	39.131393	37.178

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
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157	1.0128026	0.00000000E+00	-20.000978	21.013781	20.533
158	1.6457505	-0.56086665E-01	-19.025399	20.671150	19.903
159	1.0703301	-0.80355898E-01	-5.8401697	6.9104998	6.4474
160	13.837650	1.8338535	-0.56922547	14.406876	13.420
161	16.328803	4.3949781	0.00000000E+00	16.328803	14.657
162	34.841284	0.52230926	-0.63103785	35.472322	34.918
163	51.133414	1.7680504	-2.3686455	53.502060	51.584
164	3.3264520	0.00000000E+00	-17.700720	21.027172	19.583
165	1.6561240	0.00000000E+00	-5.6014745	7.2575986	6.6376
166	14.284568	0.00000000E+00	-2.0109348	16.295503	15.409
167	33.291794	1.0914782	-0.55341949	33.845213	33.065
168	47.337230	2.9317471	0.00000000E+00	47.337230	45.942
169	0.00000000E+00	-1.8739850	-43.413197	43.413197	42.507

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
170	0.00000000E+00	-1.8252529	-40.901702	40.901702	40.020
171	0.00000000E+00	-1.7670441	-33.285780	33.285780	32.438
172	0.00000000E+00	-1.9189628	-32.823509	32.823509	31.909
173	0.00000000E+00	-1.3444324	-22.007960	22.007960	21.368
174	0.00000000E+00	-1.3395166	-6.9312339	6.9312339	6.3804
175	0.34372554	-0.96044213	-6.2290642	6.5727898	6.0348
176	6.6297801	0.00000000E+00	-2.0301300	8.6599100	7.9855
177	21.955898	1.1517022	-4.5683173	26.524216	24.970
178	0.00000000E+00	-0.91389920	-29.470639	29.470639	29.025
179	0.00000000E+00	-1.4249957	-29.620533	29.620533	28.934
180	1.2989476	0.33282679	-0.26931154	1.5682592	1.3796
181	1.1348262	0.31292727	-0.29343939	1.4282656	1.2531
182	27.375369	2.0821200	-0.21407746	27.589447	26.578

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
183	0.12078525	-0.10828324	-20.644404	20.765189	20.651
184	0.63133562	-0.30456770	-19.637964	20.269299	19.821
185	0.00000000E+00	-1.1313378	-6.0585183	6.0585183	5.5913
186	12.375141	1.5585759	-1.3872287	13.762369	12.557
187	14.693317	3.2277627	0.00000000E+00	14.693317	13.425
188	28.648075	0.61693096E-01	-2.7642827	31.412358	30.213
189	33.247910	1.4090386	-5.5980488	38.845959	36.353
190	1.7875977	0.00000000E+00	-18.280637	20.068235	19.237
191	0.75320366E-01	-0.43540026	-5.8590373	5.9343576	5.6990
192	12.588667	0.79687862	-1.8878518	14.476519	13.374
193	27.071301	6.1574755	0.00000000E+00	27.071301	24.626
194	31.535608	7.1113228	-7.6944864	39.230094	34.990
195	13.896990	0.00000000E+00	-1.9479144	15.844905	14.966

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1

SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
196	14.475915	4.1535611	0.00000000E+00	14.475915	12.955
197	11.729377	3.8195825	0.00000000E+00	11.729377	10.396
198	15.669423	3.3116154	0.00000000E+00	15.669423	14.312
199	0.00000000E+00	-3.9951609	-43.750872	43.750872	41.896
200	0.00000000E+00	-4.0311734	-41.220167	41.220167	39.359
201	0.00000000E+00	-4.1101603	-33.520012	33.520012	31.665
202	0.00000000E+00	-4.4633163	-33.067788	33.067788	31.078
203	0.00000000E+00	-4.2889307	-22.255931	22.255931	20.453
204	0.00000000E+00	-5.5437503	-8.0369937	8.0369937	7.1997
205	0.00000000E+00	-5.2488735	-7.2122741	7.2122741	6.5016
206	4.4370306	0.00000000E+00	-3.7125052	8.1495358	7.2027
207	9.3848993	0.00000000E+00	-10.149148	19.534047	17.590
208	0.00000000E+00	-3.4075754	-29.346620	29.646620	28.098

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
209	0.00000000E+00	-3.9187041	-29.799118	29.799118	28.045
210	0.39997083	-0.33111702	-5.9208032	6.3207741	5.9891
211	0.40512949	-0.35767181	-6.0384346	6.4435641	6.0984
212	27.401647	1.0002045	0.00000000E+00	27.401647	26.916
213	0.00000000E+00	-2.5794134	-20.693502	20.693502	19.531
214	0.00000000E+00	-2.3781962	-19.729446	19.729446	18.664
215	0.00000000E+00	-4.4046628	-6.5237029	6.5237029	5.8341
216	11.236374	0.00000000E+00	-5.3735848	16.609959	14.701
217	13.086996	0.00000000E+00	-4.0798253	17.166821	15.540
218	24.919562	0.00000000E+00	-7.2698213	32.189383	29.294
219	17.520524	0.00000000E+00	-10.708174	28.228698	24.758
220	0.00000000E+00	-0.86350942	-18.357737	18.357737	17.941
221	0.00000000E+00	-3.5570739	-6.0366653	6.0366653	5.3144

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
222	11.079598	0.00000000E+00	-13.515989	24.595587	21.466
223	24.974164	0.00000000E+00	-14.450395	39.424559	34.560
224	14.495050	0.00000000E+00	-20.184258	34.679308	30.950
225	10.870802	0.00000000E+00	-13.459629	24.330432	21.110
226	10.456151	0.00000000E+00	-4.8379776	15.294128	13.569
227	11.861483	7.2848724	0.00000000E+00	11.861483	10.379
228	12.812748	6.4009082	0.00000000E+00	12.812748	11.099
229	0.00000000E+00	-2.3143889	-43.535341	43.535341	42.425
230	0.00000000E+00	-2.2425669	-41.047965	41.047965	39.974
231	0.00000000E+00	-2.1240629	-33.493240	33.493240	32.483
232	0.00000000E+00	-2.2485581	-33.013900	33.013900	31.951
233	0.00000000E+00	-1.6360202	-22.220146	22.220146	21.450
234	0.00000000E+00	-1.5352101	-7.1818096	7.1818096	6.5606

***** POST1 NODAL STRESS LISTING *****

STEP= 10 POSITION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
235	0.28553217	-1.0830288	-6.4601281	6.7456603	6.1854
236	6.3878330	0.00000000E+00	-2.1777994	8.5656324	7.8436
237	21.491054	0.89089186	-4.7581164	26.249171	24.838
238	0.00000000E+00	-1.2671779	-29.684814	29.684814	29.072
239	0.00000000E+00	-1.7798217	-29.835049	29.835049	28.986
240	1.1750866	0.21003245	-0.41511392	1.5902005	1.4126
241	1.0098406	0.19178052	-0.44072274	1.4505633	1.2935
242	27.273610	2.1284675	-0.19295440	27.466565	26.448
243	0.00000000E+00	-0.37376563	-20.776791	20.776791	20.592
244	0.19066121	-0.49866999	-19.897585	20.188246	19.754
245	0.00000000E+00	-1.9652321	-6.5537791	6.5537791	5.8358
246	11.903470	1.4993642	-1.8041486	13.707618	12.391
247	14.434970	3.0051161	0.00000000E+00	14.434970	13.253

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
248	28.944441	0.39189840E-01	-2.9495036	31.893945	30.625
249	33.256029	1.3099781	-5.7782780	39.034107	36.545
250	1.9475214	0.00000000E+00	-16.869740	18.817261	17.935
251	0.36983330	-0.44916879	-4.8072573	5.1770906	4.8354
252	13.917603	0.68896042	-1.8158466	15.733450	14.684
253	27.804779	6.0170855	0.00000000E+00	27.804779	25.383
254	31.801184	7.1122288	-7.7589331	39.560117	35.288
255	14.125194	0.00000000E+00	-1.9877100	16.112904	15.216
256	14.474526	4.2477686	0.00000000E+00	14.474526	12.938
257	11.636438	3.8029835	0.00000000E+00	11.636438	10.312
258	15.916346	3.2667858	0.00000000E+00	15.916346	14.568
259	0.00000000E+00	-2.2146717	-41.971016	41.971016	40.911
260	0.00000000E+00	-1.9362966	-19.655302	39.655302	38.727

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
261	0.00000000E+00	-1.2711089	-32.499368	32.499368	31.887
262	0.22439182E-01	-1.0622029	-31.983945	32.00638	31.483
263	0.44726592	-0.34932554	-21.733767	22.181033	21.801
264	0.78909493	-0.13346014	-6.7960194	7.5851143	7.2003
265	1.3077197	-0.12419741	-5.9711058	7.2788255	6.7261
266	10.205715	0.10214325E-01	-0.77047746	10.976193	10.616
267	29.367760	1.1612603	-0.14769085	29.515451	28.906
268	0.34038352	-0.21753873	-28.808268	29.148652	28.875
269	0.14766091	-0.52837745	-28.952713	29.100374	28.769
270	2.4994779	0.66156318	-0.17270751	2.6721854	2.3885
271	2.3913955	0.63945840	-0.18382206	2.5752175	2.3072
272	34.030102	0.00000000E+00	-3.9739239	38.004026	36.193

273 1.2446648 0.00000000E+00 -20.331949 21.576614 20.989

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1
SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
274	0.72629673	0.00000000E+00	-19.520658	20.246955	19.901
275	0.28047158	-0.95199042	-6.6373159	6.9177875	6.4267
276	13.153474	1.9765952	-1.5929483	14.746422	13.337
277	16.050509	4.7678286	0.00000000E+00	16.050509	14.297
278	35.161944	0.84351051	-0.59297959	35.754924	35.067
279	51.205795	1.7085733	-2.3164658	53.522261	51.652
280	6.2077330	0.00000000E+00	-14.964453	21.172186	18.858
281	4.5436516	0.00000000E+00	-3.9079190	8.4515706	7.3767
282	16.124727	0.24503048	-0.62083284	16.745560	16.341
283	34.110808	1.3461989	-0.50122312	34.612032	33.741
284	48.057659	3.0567624	0.00000000E+00	48.057659	46.605
285	0.00000000E+00	-3.9141015	-37.743995	37.743995	35.960
286	0.00000000E+00	-3.4483911	-35.872042	35.872042	34.297

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1
SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
287	0.00000000E+00	-2.6532267	-29.520014	29.520014	28.310
288	0.37989223E-01	-2.2451173	-29.072299	29.110288	28.067
289	0.73710621	-1.0069093	-20.802603	21.539709	20.738
290	1.3188711	-0.54879607	-7.4423605	8.7612316	8.0438
291	1.1990849	-0.53227219	-5.9677844	7.1668693	6.4926
292	9.5210180	0.00000000E+00	-2.0118314	11.532849	10.725
293	24.794656	0.92425999	-0.59716763	25.391824	24.693
294	0.61582074E-01	-1.4820698	-25.963924	26.025506	25.307
295	0.00000000E+00	-1.8777859	-26.096309	26.096309	25.233
296	1.7370264	0.21705911	-0.54416665E-01	1.7914431	1.7084
297	1.6648982	0.20025552	-0.13824385	1.8031420	1.6842
298	31.563715	0.00000000E+00	-3.4767689	35.040484	33.439
299	0.55819638	-0.80420281	-18.289098	18.847294	18.205

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= 0.00000E+00 LOAD CASE= 1
SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
300	0.89384829	-0.54248889	-17.605192	18.499041	17.848
301	1.6069842	-0.34759190	-7.3101311	8.9171153	8.1468
302	13.622601	1.0705263	-1.8693006	15.491902	14.260
303	15.518474	2.1589882	0.00000000E+00	15.518474	14.602
304	31.958023	0.00000000E+00	-1.0656117	33.023635	32.515
305	43.428200	1.7293480	-2.0171190	45.445319	43.711
306	2.7346178	0.00000000E+00	-15.044852	17.779470	16.510
307	2.6404485	0.00000000E+00	-5.6539054	8.2943539	7.3794
308	14.597607	0.00000000E+00	-3.6758511	18.273458	16.763

309	30.367479	0.43453133	-0.29915210	30.666631	30.310
* 310 *	39.130467	3.5529973	0.00000000E+00	39.130467	37.485
311	0.00000000E+00	-4.8210340	-29.585550	29.585550	27.547
312	0.00000000E+00	-4.0237235	-28.564867	28.564867	26.865

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
313	0.00000000E+00	-3.3098040	-23.776841	23.776841	22.395
314	0.41746242	-3.0177834	-23.715740	24.133202	22.654
315	1.9009991	-0.97491938	-19.346765	21.247764	20.009
316	2.4768402	-0.87826404	-9.1549252	11.631765	10.434
317	1.8872284	-0.86728238	-7.0916301	8.9788585	8.0086
318	6.8609879	0.00000000E+00	-4.9855007	11.845489	10.437
319	15.076190	0.46936431	-4.0294834	19.105674	18.172
320	0.11952219	-2.4972134	-20.732983	20.872505	19.729
321	0.26812761E-01	-2.7856688	-20.855949	20.882762	19.697
322	1.2153660	0.00000000E+00	-1.2261199	2.414859	2.1480
323	1.1594294	0.00000000E+00	-1.3008171	2.4602465	2.1639
324	19.622404	1.2225324	0.00000000E+00	19.622404	19.050
325	0.74595626	-1.4708657	-15.246613	15.992570	15.016

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
326	1.2592194	-0.96231602	-14.987138	16.246357	15.308
327	3.1610048	-0.10311699E-01	-8.9799284	12.140933	11.011
328	11.710747	0.42324350	-3.0026672	14.713415	13.453
329	12.953093	0.80712506	-1.0619226	14.015015	13.233
330	22.008344	0.14655361	-3.6855096	25.693853	24.119
331	22.585693	1.0870182	-3.8296664	26.415359	24.740
332	2.2796012	0.00000000E+00	-14.443714	16.723315	15.805
333	3.7550390	0.00000000E+00	-8.3641001	12.119139	10.805
334	12.033268	0.00000000E+00	-4.9116508	16.944919	15.204
335	20.717549	1.6735042	-0.47392922	21.191478	20.722
336	21.252658	3.4387205	-5.5325828	26.785241	24.444
337	5.8891817	0.00000000E+00	-1.4127765	7.3019582	6.7081
338	6.0764704	1.3275188	0.00000000E+00	6.0764704	5.6530

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
339	8.9339611	1.1174455	0.00000000E+00	8.9339611	8.4342
340	9.5554915	1.5551633	0.00000000E+00	9.5554955	8.8807
341	0.00000000E+00	-4.2743210	-17.555943	17.555943	15.985
342	0.62973039	-3.4415717	-17.964019	18.593749	17.009
343	0.73682326	-3.4294712	-15.511074	16.247898	14.688
344	1.2087641	-2.8842794	-16.062840	17.271604	15.771

345	3.9582574	-0.19716482	-16.398558	20.356815	18.776
346	3.6784151	-1.2584138	-10.658958	14.337373	12.676
347	2.7193744	-1.2525729	-8.8130220	11.532396	10.187
348	6.7091720	0.00000000E+00	-8.4831580	15.192337	13.236
349	4.8747586	-0.95398052	-9.6271938	14.502152	12.813
350	0.49373722	-3.0451070	-13.658001	14.171539	12.842
351	0.43809134	-3.2492022	-13.776057	14.214148	12.870

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
352	0.56931541	0.00000000E+00	-5.0753224	5.6446389	5.3920
353	0.55008312	-0.31456456E-02	-5.1204011	5.6704842	5.4254
354	11.507735	0.37514446	-0.19356425	11.701299	11.434
355	1.5600657	-1.4869102	-11.772854	13.332920	12.105
356	2.3800942	-0.81763751	-12.208528	14.588622	13.372
357	4.9647930	0.00000000E+00	-10.498275	15.463068	13.723
358	8.1672515	0.00000000E+00	-6.0564259	14.223677	12.424
359	9.2643849	0.00000000E+00	-4.8374063	14.101791	12.500
360	14.064141	0.00000000E+00	-6.3834534	20.447594	18.506
361	7.2020184	0.00000000E+00	-6.7960336	13.998052	12.377
362	3.5438977	0.00000000E+00	-12.276673	15.820571	14.559
363	5.1782262	0.00000000E+00	-10.256921	15.435147	13.859
364	8.7446517	0.00000000E+00	-11.006888	19.751540	17.245

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
365	13.401891	0.00000000E+00	-8.7034320	22.105323	19.525
366	6.4811557	0.00000000E+00	-11.697391	18.178546	16.725
367	2.2979414	-0.40984479	-8.6555784	10.953520	9.9685
368	3.7402350	0.00000000E+00	-2.3317255	6.0719605	5.3570
369	6.6376016	3.8390541	0.00000000E+00	6.6376016	5.8857
370	7.9580007	3.4050526	0.00000000E+00	7.9580007	6.9351
371	12.976530	0.00000000E+00	-5.9925584	18.969088	17.179
372	13.028196	0.00000000E+00	-6.3212700	19.349466	17.454
373	10.887567	0.00000000E+00	-5.2506635	16.138230	14.599
374	10.198692	0.00000000E+00	-5.9241681	16.122861	14.414
375	11.838217	0.00000000E+00	-6.8583564	18.696573	16.600
376	7.0398627	0.00000000E+00	-4.3516857	11.391548	10.106
377	4.8457174	0.00000000E+00	-3.8120582	8.6577756	7.6016

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
378	6.7339378	0.00000000E+00	-5.8189673	12.552905	10.985
379	3.9165518	-0.79216414	-5.8724523	9.7890042	8.5297
380	9.2874857	0.00000000E+00	-4.6467373	13.934223	12.580

381	9.0737118	0.00000000E+00	-4.7015085	13.775220	12.428
382	3.6077357	0.00000000E+00	-0.97043410	4.5781698	4.2120
383	3.5042703	0.00000000E+00	-1.0387502	4.5430204	4.1560
384	4.8013837	1.3820888	-1.6491363	6.4505200	5.6434
385	10.142670	0.00000000E+00	-3.6190988	13.761769	12.593
386	9.9477953	0.00000000E+00	-4.5850892	14.532885	13.057
387	8.5084511	0.00000000E+00	-4.9512725	13.459724	11.877
388	6.6349776	0.28328973	-2.4450054	9.0799830	8.1351
389	8.6679008	0.34275125	-1.4968876	10.164788	9.4022
390	9.0306350	0.00000000E+00	-3.1622337	12.192869	10.974

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
391	4.9799610	0.16244079	-3.4463126	8.4262736	7.5438
392	10.218180	0.00000000E+00	-5.3395141	15.557694	13.809
393	8.8272373	0.00000000E+00	-4.7615943	13.588832	12.026
394	8.8741415	0.00000000E+00	-4.5955286	13.469670	11.890
395	11.118277	0.80721941E-01	-1.6151343	12.733411	12.022
396	9.3459005	1.7179337	-4.8285403	14.174441	13.200
397	3.5388727	0.00000000E+00	-3.1862374	6.7251101	5.8267
398	7.6349705	3.3691374	0.00000000E+00	7.6349705	6.7645
399	5.7701030	2.3876881	0.00000000E+00	5.7701030	5.0300
400	9.4407208	2.2288631	0.00000000E+00	9.4407208	8.5476
401	35.446447	0.00000000E+00	-1.5736112	37.020058	36.258
402	33.468021	0.00000000E+00	-1.6584155	35.126437	34.330
403	30.139450	0.00000000E+00	-1.1816084	31.321059	30.748

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
404	26.783044	0.00000000E+00	-1.8136227	28.596667	27.737
405	21.273415	0.00000000E+00	-1.9218082	23.195223	22.327
406	16.663306	0.00000000E+00	-1.2004141	17.863721	17.295
407	12.620468	0.00000000E+00	-1.4273946	14.047863	13.412
408	7.4184511	0.00000000E+00	-1.9633306	9.3817817	8.6686
409	7.0854550	0.32390964	-1.0563751	8.1418302	7.5835
410	27.379463	0.00000000E+00	-1.1914770	28.570940	27.997
411	27.119023	0.00000000E+00	-1.2082047	28.327228	27.746
412	15.365753	0.12845620	-0.11044155	15.476194	15.358
413	15.309815	0.10828594	-0.12479937	15.434614	15.319
414	4.3235435	0.22876407	-1.8053893	6.1289328	5.6218
415	25.985542	0.00000000E+00	-0.28728600	26.272828	26.130
416	22.976677	0.00000000E+00	-0.91748904	23.894166	23.455

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT BOTTOM

NODE	SIG1	SIG2	SIG3	SI	SI
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417	15.357870	0.00000000E+00	-0.97188432	16.329755	15.892
418	12.745052	0.00000000E+00	-1.1135603	13.858612	13.368
419	13.572641	0.55142528E-02	-0.81777405	14.390415	14.017
420	5.6590672	0.00000000E+00	-0.62042241	7.2794896	7.0302
421	5.1290427	0.00000000E+00	-1.5608793	6.6899219	6.1637
422	20.599901	0.00000000E+00	-1.3831371	21.983038	21.325
423	15.673356	0.00000000E+00	-0.89391215	16.567268	16.162
424	12.864512	0.00000000E+00	-2.6203940	15.484906	14.355
425	11.183987	0.00000000E+00	-2.6863109	13.870298	12.885
426	11.006471	1.4590847	0.00000000E+00	11.006471	10.354

MAXIMUMS

NODE	279	227	199	279	279
VALUE	51.205795	7.2848724	-43.750872	53.522261	51.65

NODAL STRESSES ARE SHELL MIDDLE

PRINT PRIN NODAL STRESSES PER NODE

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
1	23.036260	0.00000000E+00	-18.393518	41.429778	35.954
2	22.325522	0.00000000E+00	-17.175123	39.500645	34.307
3	20.341918	0.00000000E+00	-13.280708	33.622626	29.337
4	18.962199	0.00000000E+00	-13.463896	32.426095	28.216
5	17.489235	0.00000000E+00	-8.8019377	26.291173	23.189
6	13.715762	0.00000000E+00	-2.4409574	16.156720	15.091
7	11.572155	0.00000000E+00	-2.8116366	14.383792	13.205
8	9.4461927	0.83751501	-0.68721007	13.133403	9.4641
9	9.9817928	3.5715710	0.00000000E+00	9.9817928	8.9786
10	18.308289	0.00000000E+00	-11.719785	30.028074	26.215
11	18.070517	0.00000000E+00	-11.801944	29.872461	26.061
12	10.829990	0.12444977	0.00000000E+00	10.829990	10.768
13	10.829990	0.12444977	0.00000000E+00	10.829990	10.768

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
14	11.209322	3.2046320	0.00000000E+00	11.209322	10.191
15	17.559483	0.00000000E+00	-7.4643684	25.023851	22.251
16	15.876277	0.00000000E+00	-7.7105489	23.586826	20.838
17	12.694662	0.00000000E+00	-2.2731325	14.967795	13.977
18	10.680404	3.7849466	0.00000000E+00	10.680404	9.3881
19	12.511558	4.0797485	0.00000000E+00	12.511558	11.073
20	16.565850	7.0516968	0.00000000E+00	16.565850	14.976
21	28.641176	2.7075262	0.00000000E+00	28.641176	27.404
22	14.659787	0.00000000E+00	-7.8106921	22.470479	19.759
23	12.927598	0.00000000E+00	-2.1878675	15.115466	14.155
24	13.518417	4.3544246	0.00000000E+00	13.518417	11.951
25	17.818380	6.6742647	-0.26521943E-03	17.818645	16.938
26	34.457415	1.5504983	0.00000000E+00	34.457415	33.708

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
27	5.2439097	0.00000000E+00	-20.329349	25.573259	23.456
28	5.0297209	0.00000000E+00	-19.110294	24.140015	22.116
29	4.0810508	0.00000000E+00	-15.065168	19.146218	17.533
30	3.5360736	0.00000000E+00	-15.190119	18.726192	17.278
31	3.7279793	0.00000000E+00	-10.777137	14.500116	13.073
32	2.5966773	0.00000000E+00	-4.0031929	6.5998702	5.8247
33	2.0616228	0.00000000E+00	-4.1149920	6.1766148	5.4759
34	4.8213172	0.00000000E+00	-3.9835007	8.8048179	7.7446
35	7.1373116	0.22195922	-1.9131789	9.0504905	8.3193
36	3.1721444	0.00000000E+00	-13.287164	16.459309	15.175
37	2.9218409	0.00000000E+00	-13.374141	16.295982	15.099
38	1.3581576	0.30442714E-02	-0.27070882	1.6288664	1.5427
39	1.3581576	0.30442714E-02	-0.27070882	1.6288664	1.5427

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
40	10.116077	0.54950209	-0.79895026	10.915027	10.317
41	3.1359525	0.00000000E+00	-9.0300919	12.166044	10.995
42	2.7404383	0.00000000E+00	-9.2248628	11.965301	10.893
43	3.0338882	0.00000000E+00	-4.1023627	7.1362509	6.2281
44	6.0907845	0.62361680	-0.34081202	6.4315965	6.0252
45	6.7865018	0.59570105	-0.46446870	7.2509705	6.8072
46	14.835362	0.38202618	-1.3628773	16.198239	15.449
47	16.330552	1.1533485	-1.2476313	17.578183	16.590
48	2.8268224	0.00000000E+00	-9.2460311	12.072854	10.953
49	3.2443012	0.00000000E+00	-3.9773110	7.2216111	6.2914
50	7.2697316	1.3603165	-0.28433198	7.5540636	6.9340
51	15.829162	3.7736479	0.00000000E+00	15.829162	14.321
52	19.369422	3.8885692	0.00000000E+00	19.369422	17.750

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
53	6.8694428	1.3496572	0.00000000E+00	6.8694428	6.3039
54	7.6593582	2.3800269	0.00000000E+00	7.6593582	6.7923
55	3.4121064	0.14754591	-0.24732900	3.6594354	3.4809
56	3.2762843	0.00000000E+00	-0.78002206	4.0563064	3.7343
57	0.3050241	-2.0694195	-26.025427	26.330730	25.261
58	0.33256218	-1.9090423	-24.669221	25.001784	23.988
59	0.24606445	-1.7731847	-19.897748	20.143813	19.249
60	0.19299227	-1.6733439	-19.877864	20.070857	19.242
61	0.67006281	-0.54802056	-15.071895	15.741958	15.177
62	1.4274400	-1.3562609	-6.9553122	8.3827521	7.5327

63	1.0347765	-1.3562609	-6.0094548	7.0442312	6.3405
64	4.6035773	0.0000000E+00	-4.6618297	9.2654070	8.1181
65	5.8809209	0.0000000E+00	-3.8443064	9.7252273	8.6554

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
66	0.10301519	-1.6827081	-17.516989	17.620004	16.843
67	0.00000000E+00	-1.9016439	-17.620742	17.620742	16.809
68	0.34214220	-0.55519337E-01	-3.8902357	4.2323779	4.0547
69	0.34214220	-0.55519337E-01	-3.8902357	4.2323779	4.0547
70	12.915877	0.00000000E+00	-4.1723923	17.088269	15.494
71	0.22377697	-1.3563237	-12.652848	12.876625	12.192
72	0.11098164	-1.1931223	-12.691484	12.802465	12.236
73	1.3982123	0.00000000E+00	-7.0070527	8.4052650	7.8195
74	8.1818077	0.00000000E+00	-3.9879705	12.169778	10.749
75	8.4745053	0.00000000E+00	-4.9258034	13.400309	11.754
76	16.263651	0.00000000E+00	-3.8360876	20.099739	18.606
77	11.367586	0.00000000E+00	-2.3821144	13.749701	12.794
78	0.29407175	-0.72600390	-12.487007	12.781079	12.306

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
79	1.6141798	0.00000000E-00	-6.7996376	8.4138174	7.7535
80	8.6735558	0.00000000E+00	-6.7828104	15.456366	13.567
81	15.617805	0.00000000E+00	-9.3616188	24.979424	21.893
82	11.223886	0.00000000E+00	-5.6745502	16.898436	15.097
83	6.8737170	0.00000000E+00	-3.7431613	10.616878	9.3534
84	6.0487718	0.00000000E+00	-2.7011678	8.7499395	7.7979
85	2.7324361	0.43112026	-1.1584837	3.8909198	3.4064
86	2.0762006	0.30543733	-1.5668537	3.6430544	3.2041
87	0.00000000E+00	-2.4989877	-33.213935	33.213935	32.080
88	0.99481587E-02	-2.2251578	-31.460760	31.470708	30.457
89	0.55848974E-01	-1.7650465	-25.472439	25.528288	24.706
90	0.16783337	-1.6893604	-25.176754	25.344588	24.493
91	0.77265872	-0.80640585	-18.159822	18.932481	18.201

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
92	1.4753672	-0.17790889	-6.8966618	8.3720290	7.7081
93	0.89973070	-0.17790889	-5.2337548	6.1334855	5.6893
94	5.7462563	0.77869206E-01	-2.3578715	8.1041278	7.3063
95	17.661293	0.74754769	-1.5710639	19.232357	18.305
96	0.12581174	-1.4615947	-22.463946	22.589758	21.865
97	0.28196430E-02	-1.7589203	-22.589185	22.592004	21.802
98	1.2294354	0.00000000E+00	-0.78042563	2.0098611	1.8011

99	1.2294354	0.00000000E+00	-0.78042563	2.0098611	1.8011
100	21.297616	1.6368568	-1.3906412	22.688257	21.341
101	0.30554051	-1.2356493	-16.008326	16.313867	15.617
102	0.21969960	-1.1636544	-15.746352	15.966052	15.344
103	1.5132355	-0.35002023E-01	-6.9232449	8.4364804	7.8166
104	11.045431	0.00000000E+00	-1.3797691	12.425200	11.843

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
105	11.446409	0.00000000E+00	-0.95172991	12.398139	11.996
106	22.489720	0.48480140	-1.9980402	24.487760	23.399
107	25.554783	2.0979302	-1.3581687	26.912952	25.473
108	0.52991838	-0.68069664	-15.199994	15.729912	15.161
109	1.7839580	0.00000000E+00	-6.6860855	8.4700435	7.7804
110	12.061111	0.71254580	1.1454216	13.206533	12.415
111	21.028157	2.8536377	0.00000000E+00	21.028157	19.835
112	23.624375	3.3537674	0.00000000E+00	23.624375	22.142
113	10.142385	3.5060410	0.00000000E+00	10.142385	8.9219
114	6.8438236	2.4047133	0.00000000E+00	6.8438236	6.1082
115	3.2599811	0.28958761	-0.17520623	3.4351671	3.2588
116	2.4971391	0.28482425	-0.19115191	2.6882911	2.5207
117	0.17630480E-01	-1.1239131	-38.846054	38.863684	38.316

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
118	0.18153375	-1.0196442	-36.689679	36.871212	36.292
119	0.54954936	-0.67200132	-29.720428	30.269978	29.680
120	0.62365054	-0.59134041	-29.209987	29.833638	29.245
121	1.2091469	-0.22085293	-20.010733	21.219880	20.556
122	2.2687688	0.00000000E+00	-5.9246300	8.1933988	7.3549
123	1.9033525	0.00000000E+00	-4.6054996	6.5088521	5.8027
124	9.6684951	0.37344071E-01	-0.41641952	10.084915	9.8703
125	26.180041	0.50501630	-0.80834949E-01	26.260876	25.978
126	0.80582359	-0.31161867	-26.310317	27.116140	26.579
127	0.56036141	-0.55988838	-26.453726	27.014087	26.472
128	2.0849311	0.73845485	0.00000000E+00	2.0849311	1.9192
129	2.0849311	0.73845485	0.00000000E+00	2.0849311	1.9192
130	34.059993	0.46004193	-0.13363950	34.193633	33.904

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
131	0.93249492	-0.16652448	-18.540681	19.473176	18.960
132	0.84094119	-0.20724368	-18.001827	18.842769	18.351
133	2.0601441	0.00000000E+00	-5.9690039	8.0291481	7.2652
134	13.609026	0.65814056	-0.41026661E-01	13.650052	13.326

135	14.521612	1.1221619	0.00000000E+00	14.521612	14.001
136	32.335803	0.86891211	0.00000000E+00	32.335803	31.914
137	44.629125	0.30210838	-0.84760303E-01	44.713885	44.522
138	1.4728189	0.00000000E+00	-17.155460	18.628279	17.956
139	2.4833541	0.00000000E+00	-5.7606314	8.2439855	7.3650
140	14.623680	0.66856025	0.00000000E+00	14.623680	14.309
141	30.215432	0.52741312	-0.18159932	30.397031	30.053
142	38.752950	0.43382995E-01	-0.31753257	39.070483	38.892
143	0.00000000E+00	-1.6243778	-42.083949	42.083949	41.298

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
144	0.00000000E+00	-1.3933113	-39.678518	39.678518	39.004
145	0.91687027E-01	-0.75231184	-32.183303	32.274990	31.864
146	0.10656292	-0.62194666	-31.661020	31.767583	31.511
147	0.54036554	-0.26622713	-21.300968	21.841334	21.455
148	1.6647121	0.00000000E+00	-5.9079494	7.5726615	6.9474
149	2.0825478	0.00000000E+00	-5.1533728	7.2359206	6.4766
150	10.575070	0.15649486	-0.70640568	11.281475	10.879
151	29.734705	0.68096854	-0.11002302	29.844728	29.461
152	0.30263551	-0.27917316	-28.574388	28.877023	28.591
153	0.76208467E-01	-0.59151194	-28.730082	28.806291	28.480
154	2.3294063	0.77662533	-0.78179620E-01	2.4075860	2.1383
155	2.3294063	0.77662533	-0.78179620E-01	2.4075860	2.1383
156	36.647877	0.81879933	-0.22679984	36.874647	36.364

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
157	0.43835456	-0.20484393	-20.196601	20.634955	20.322
158	0.33572853	-0.27778171	-19.485226	19.820955	19.524
159	1.1983958	-0.29091372E-01	-5.7634485	6.9618442	6.4831
160	13.876057	1.2647267	0.00000000E+00	13.876057	13.301
161	15.464359	1.7166788	0.00000000E+00	15.464359	14.697
162	35.275831	1.2865458	-0.17876099	35.454592	34.753
163	51.504017	0.63100444	-0.40566985	51.909687	51.399
164	0.96175231	0.00000000E+00	-18.451245	19.412997	18.957
165	1.6772239	0.00000000E+00	-5.5635868	7.2408107	6.6172
166	15.401275	1.4140995	0.00000000E+00	15.401275	14.765
167	33.118318	1.0092441	-0.78649554	33.904814	33.051
168	45.963276	0.50843477E-01	-1.2237326	47.187009	46.585
169	0.00000000E+00	-1.8739850	-43.413197	43.413197	42.507

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
170	0.00000000E+00	-1.8252529	-40.901702	40.901702	40.020

171	0.00000000E+00	-1.3661250	-33.157389	33.157389	32.498
172	0.00000000E+00	-1.5128378	-32.693641	32.693641	31.964
173	0.00000000E+00	-1.3441110	-22.007518	22.007518	21.368
174	0.32367422	-0.54968324	-6.5807012	6.9043754	6.5192
175	0.66739944	-0.19139476	-5.8848355	6.5522349	6.1739
176	6.6301614	0.00000000E+00	-2.0293247	8.6594861	7.9854
177	23.003891	1.0090517	-1.8614492	24.865340	23.673
178	0.00000000E+00	-0.88839517	-29.448871	29.448871	29.015
179	0.00000000E+00	-1.4400468	-29.611661	29.611661	28.919
180	1.2019932	0.24774554	-0.28482255	1.4868157	1.3225
181	1.2019932	0.24774554	-0.28482255	1.4868157	1.3225
182	27.043816	1.9023497	-1.6953663	28.739182	27.126

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
183	0.00000000E+00	-0.81900078	-20.882540	20.882540	20.486
184	0.00000000E+00	-1.2645568	-20.121437	20.121437	19.520
185	0.00000000E+00	-0.93219183	-6.0130980	6.0130980	5.6150
186	12.355156	0.61673475	-0.45976805	12.814924	12.315
187	13.705565	0.61673475	-0.27901044	13.984575	13.566
188	28.871232	0.45736199	-1.9860557	30.857288	29.801
189	34.686336	2.4939062	-2.0656433	36.751979	34.832
190	0.00000000E+00	-0.63369706	-19.031616	19.031616	18.723
191	0.60226524E-01	-0.45870157	-5.8938697	5.9540962	5.7153
192	13.728868	2.4233093	-0.18142968	13.910298	12.962
193	27.260089	5.9226661	0.00000000E+00	27.260089	24.879
194	32.713939	5.7903441	0.00000000E+00	32.713939	30.237
195	15.876724	4.3082664	0.00000000E+00	15.876724	14.220

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
196	13.041653	3.7966841	0.00000000E+00	13.041653	11.639
197	5.7273514	0.42120699E-02	-0.55937118E-01	5.7832886	5.7538
198	4.8708107	0.00000000E+00	-0.65779841	5.5286091	5.2313
199	0.00000000E+00	-3.9951609	-43.750872	43.750872	41.896
200	0.00000000E+00	-4.0311734	-41.220167	41.220167	39.359
201	0.00000000E+00	-3.7050006	-33.398396	33.398396	31.710
202	0.00000000E+00	-4.0511387	-32.944688	32.944688	31.117
203	0.00000000E+00	-4.2887421	-22.255706	22.255706	20.452
204	0.00000000E+00	-4.9292506	-7.1975726	7.1975726	6.4510
205	0.00000000E+00	-4.6383340	-6.3919949	6.3919949	5.7666
206	4.4365665	0.00000000E+00	-3.7130765	8.1496430	7.2027
207	10.425417	0.00000000E+00	-4.5663873	14.991804	13.421
208	0.00000000E+00	-3.3890921	-29.646208	29.646208	28.105

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
209	0.00000000E+00	-3.9403339	-29.811657	29.811657	28.049
210	0.32473238	-0.38155743	-6.1327608	6.4574932	6.1364
211	0.32473238	-0.38155743	-6.1327608	6.4574932	6.1364
212	23.095428	0.00000000E+00	-6.1742036	29.269632	26.729
213	0.00000000E+00	-3.4390749	-20.960204	20.960204	19.469
214	0.00000000E+00	-4.0629196	-20.229562	20.229562	18.536
215	0.00000000E+00	-4.1774364	-6.3687960	6.3687960	5.6662
216	11.264925	0.00000000E+00	-5.3576780	16.622603	14.711
217	12.186543	0.00000000E+00	-7.1539658	19.340508	16.938
218	25.628592	0.00000000E+00	-5.5109638	31.139556	28.856
219	19.521734	0.00000000E+00	-3.7616926	23.283427	21.677
220	0.00000000E+00	-3.4585862	-19.118386	19.118386	17.645
221	0.00000000E+00	-3.4927375	-5.8450506	5.8450506	5.1538

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
222	12.242251	0.00000000E+00	-9.6059989	21.848250	19.240
223	24.526035	0.00000000E+00	-15.006237	39.532372	34.571
224	17.810704	0.00000000E+00	-9.1911491	27.001853	24.087
225	14.023508	0.00000000E+00	-6.2648088	20.288316	17.993
226	11.343878	0.00000000E+00	-4.6666812	16.010559	14.313
227	4.7943442	0.72941171	-1.9174927	6.7118369	5.8575
228	3.5405787	0.49343210	-2.6861708	6.2267495	5.4290
229	0.00000000E+00	-2.3143889	-43.535341	43.535341	42.425
230	0.00000000E+00	-2.2425669	-41.047965	41.047965	39.974
231	0.00000000E+00	-1.7255601	-33.364203	33.364203	32.538
232	0.00000000E+00	-1.8448283	-32.883409	32.883409	32.001
233	0.00000000E+00	-1.6356699	-22.219667	22.219667	21.449
234	0.26234471	-0.66990323	-6.8242312	7.0865759	6.6802

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
235	0.54786479	-0.23880360	-6.1090986	6.6569634	6.3057
236	6.3881104	0.00000000E+00	-2.1770415	8.5651519	7.8434
237	22.596658	0.87233104	-1.9529592	24.549617	23.396
238	0.00000000E+00	-1.2418950	-29.664284	29.664284	29.063
239	0.00000000E+00	-1.7953236	-29.827633	29.827633	28.972
240	1.0799411	0.13245373	-0.43021124	1.5101524	1.3669
241	1.0799411	0.13245373	-0.43021124	1.5101524	1.3669
242	26.759912	1.7019769	-1.8835610	28.643473	27.038
243	0.00000000E+00	-1.2016968	-21.018912	21.018912	20.445
244	0.00000000E+00	-1.8992689	-20.381056	20.381056	19.502
245	0.00000000E+00	-1.7648641	-6.4972990	6.4972990	5.8266
246	11.887998	0.55179852	-0.86914986	12.757148	12.112
247	13.433348	0.55179852	-0.46608631	13.899435	13.422

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
248	29.166100	0.36882202	-2.1151303	31.281230	30.209
249	34.722352	2.4244741	-2.1381369	36.860489	24.950
250	0.86749316E-01	-0.56502678	-17.615970	17.702719	17.390
251	0.33579446	-0.45740173	-4.8239248	5.1597192	4.8265
252	15.058785	2.4276296	-0.18475166	15.243537	14.235
253	27.998638	5.7791136	0.00000000E+00	27.998638	25.647
254	32.993149	5.7670952	0.00000000E+00	32.993149	30.521
255	16.095673	4.5092217	0.00000000E+00	16.095673	14.381
256	12.958922	3.8459360	0.00000000E+00	12.958922	11.549
257	5.6725282	0.11478018E-01	-0.83646134E-01	5.7561743	5.7099
258	4.9114788	0.00000000E+00	-0.75136268	5.6628415	5.327
259	0.00000000E+00	-2.2146717	-41.971016	41.971016	40.911
260	0.00000000E+00	-1.9362966	-39.655302	39.655302	38.727

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
261	0.83686241E-01	-0.98536907	-32.365756	32.449442	31.934
262	0.22485766E-01	-0.68749836	-31.848843	31.871329	31.525
263	0.44775102	-0.34927315	-21.733077	22.180828	21.800
264	1.7519590	0.00000000E+00	-6.4223009	8.1742599	7.5140
265	2.2634202	0.00000000E+00	-5.6020377	7.8654579	7.0365
266	10.206838	0.10425173E-01	-0.77048785	10.977325	10.617
267	29.314174	0.65724988	-0.14731993	29.461494	29.070
268	0.36070720	-0.19964779	-28.747858	29.108560	28.834
269	0.14102582	+0.52349825	-28.904121	29.045147	28.720
270	2.4205858	0.63539299	-0.16361086	2.5841966	2.3023
271	2.4205858	0.63539299	-0.16361086	2.5841966	2.3023
272	35.788332	0.83272989	-0.22251700	36.010849	35.495
273	0.57886633	-0.71303557E-01	-20.505173	21.084039	20.771

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
274	0.15418119	-0.94286346	-19.978207	20.132388	19.615
275	0.32229621	-0.82741596	-6.5468924	6.8691896	6.3979
276	13.184368	1.0657586	-0.68727217	13.871640	13.090
277	15.142020	2.0714372	0.00000000E+00	15.142020	14.233
278	35.612757	1.6084616	-0.13842069	35.751178	34.924
279	51.638952	0.70265511	-0.36104736	51.999999	51.476
280	3.8309794	0.00000000E+00	-15.731732	19.562711	17.964
281	4.5695928	0.00000000E+00	-0.8738484	8.4434411	7.3799
282	17.246423	3.0528565	0.00000000E+00	17.246423	15.987
283	33.897295	1.2593397	-0.75027887	34.647574	33.697
284	46.615823	0.92561360E-01	-1.1855298	47.801353	47.194
285	0.00000000E+00	-3.9141015	-37.743995	37.743995	35.960
286	0.00000000E+00	-3.4483911	-35.872042	35.872042	34.297

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
287	0.00000000E+00	-2.3088829	-29.393407	29.393407	28.336
288	0.38212449E-01	-1.8961917	-28.944689	28.982902	28.090
289	0.73775811	-1.0069982	-20.801973	21.539731	20.738
290	1.7371722	0.00000000E+00	-7.0877415	8.8249137	8.1482
291	1.6173701	0.00000000E+00	-5.6177631	7.2351333	6.5966
292	9.5208937	0.00000000E+00	-2.0114920	11.532386	10.725
293	24.628930	0.35755132	-0.41438902	25.043319	24.668
294	0.63197613E-01	-1.4478621	-25.915061	25.978266	25.275
295	0.00000000E+00	-1.8783923	-26.058975	26.058975	25.190
296	1.7678395	0.14678660	-0.84045712E-01	1.8518852	1.7607
297	1.7678395	0.14678660	-0.84045712E-01	1.8518852	1.7607
298	32.584402	0.44666887	-0.34355985	32.927961	32.542
299	0.23244682	-1.1575735	-18.477543	18.709990	18.070

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
300	0.17266421	-1.1969486	-18.065616	18.238280	17.615
301	1.6552290	-0.27829319	-7.1775523	8.8327814	8.0747
302	13.694045	0.24199827	-1.0633579	14.757403	14.165
303	14.727624	0.24199827	-0.49703147	15.224656	14.882
304	32.125519	0.15375201	-0.40445202	32.529971	32.260
309	43.365667	0.97171462E-01	-0.17739095	43.543058	43.406
306	0.70312912	-0.88887674E-01	-15.818801	16.521930	16.148
307	2.6293243	0.00000000E+00	-5.5881932	8.2175176	7.3114
308	15.686869	0.20469228	-0.71843329	16.405302	15.969
309	30.313371	0.26351152	-0.43491204	30.748283	30.407
310	37.984442	0.00000000E+00	-0.24991532	38.234357	38.110
311	0.00000000E+00	-0.8210340	-29.585550	29.585550	27.547
312	0.00000000E+00	-4.0237235	-28.564867	28.564867	26.865

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
313	0.00000000E+00	-3.0116436	-23.683653	23.683653	22.417
314	0.41784323	-2.7160558	-23.620946	24.038789	22.672
315	1.9015481	-0.97542549	-19.346963	21.248511	20.009
316	2.5699786	-0.22493643	-8.8148359	11.384814	10.330
317	1.9804254	-0.22493643	-6.7591749	8.7396003	7.9097
318	6.8612716	0.00000000E+00	-4.9848888	11.846160	10.437
319	15.959678	0.61106217	-2.3832363	18.342914	17.332
320	0.11882986	-2.4740715	-20.726303	20.845133	19.732
321	0.20877529E-01	-2.7857104	-20.856163	20.877041	19.695
322	1.2060025	0.00000000E+00	-1.3677738	2.5737763	2.2630

323	1.2060025	0.00000000E+00	-1.3677738	2.5737763	2.2630
324	19.458302	1.6369519	-1.3736325	20.831934	19.508
325	0.48467459	-1.7846732	-15.470508	15.955183	14.985

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
326	0.74708954	-1.5314084	-15.467133	16.214222	15.235
327	3.2183594	0.00000000E+00	-8.8403945	12.058754	10.914
328	11.772804	0.00000000E+00	-2.6528098	14.425614	13.387
329	12.197190	0.00000000E+00	-2.3220947	14.519285	13.602
330	22.238618	0.39044586	-2.9849253	25.223544	23.783
331	23.529031	1.9770902	-1.3710912	24.900122	23.542
332	1.3491642	-0.70605018	-15.201172	16.550336	15.635
333	3.7151442	0.00000000E+00	-8.3138475	12.028992	10.724
334	13.060831	0.29942188	-2.7912354	15.852066	14.603
335	20.770404	1.5630477	-0.61579673	21.386200	20.426
336	22.013862	2.1449393	-0.28644592	22.300308	21.191
337	7.5827107	3.4300418	0.00000000E+00	7.5827107	6.5767
338	5.1020807	1.3660887	0.00000000E+00	5.1020807	4.6590

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
339	2.5029524	0.18050185	-0.31970429	2.822654'	2.6210
340	1.5087148	0.12226539	-0.22547829	1.7341F 1	1.5903
341	0.00000000E+00	-4.2743210	-17.555943	17.55F	15.985
342	0.62973039	-3.4415717	-17.964019	18.5' 4p	17.009
343	0.73682326	-3.1820732	-15.432123	16 346	14.677
344	1.2090742	-2.6346851	-15.982368	1' ,1442	15.753
345	3.9580346	-0.19760121	-16.399387	2. 357422	18.777
346	3.6784957	-0.94140343	-10.119422	13.797918	12.241
347	2.7194293	-0.94140343	-8.2810102	11.000439	9.7571
348	6.7087338	0.00000000E+00	-8.4840250	15.192759	13.237
349	5.2325355	-0.24416292	-6.2670133	11.499549	10.114
350	0.49676441	-3.0426033	-13.670745	14.167509	12.858
351	0.43722214	-3.2618070	-13.800304	14.237526	12.891

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
352	0.52433979	-0.26131351E-01	-5.2103144	5.7346542	5.4869
353	0.52433979	-0.26131351E-01	-5.2103144	5.7346542	5.4869
354	8.6923159	0.00000000E+00	-4.6755666	13.367883	12.151
355	1.3508032	-1.7231511	-12.074754	13.425557	12.183
356	1.8246116	-1.0159874	-12.751475	14.576087	13.461
357	5.0358845	0.00000000E+00	-10.367959	15.403843	13.654
358	8.2421284	0.00000000E+00	-6.1402932	14.382422	12.546

359	8.4992165	0.00000000E+00	-6.5225168	15.021733	13.126
360	14.492928	0.17513881	-5.5763295	20.069257	18.203
361	8.3974461	0.74050817E-01	-2.5814588	10.978905	10.089
362	2.5153514	-0.82928036E-01	-13.074207	15.589558	14.628
363	5.1969093	0.00000000E+00	-10.169628	15.366537	13.590
364	9.6881514	0.00000000E+00	-9.1102904	18.798442	16.400

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
365	13.252235	0.00000000E+00	-9.0466073	22.298842	19.667
366	8.5804471	0.00000000E+00	-4.5899111	13.170358	11.839
367	3.8064592	0.00000000E+00	-4.1237321	7.9301913	7.0232
368	3.9557538	0.00000000E+00	-2.5717623	6.5275161	5.7730
369	1.9915362	0.27881290	-0.96035827	2.9518945	2.5777
370	1.3923165	0.16351532	-0.97579703	2.3681135	2.0773
371	12.976330	0.00000000E+00	-5.9925584	18.969088	17.179
372	13.028196	0.00000000E+00	-6.3212700	19.349466	17.484
373	11.130626	0.00000000E+00	-5.2984413	16.429067	14.856
374	10.445108	0.00000000E+00	-5.9706709	16.415779	14.673
375	11.837385	0.00000000E+00	-6.8594642	18.696849	16.600
376	7.5494896	0.00000000E+00	-4.2255926	11.775082	10.438
377	5.3405226	0.00000000E+00	-3.6952018	9.0357244	7.9292

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
378	6.7329063	0.00000000E+00	-5.8196045	12.552511	10.985
379	4.1440373	0.00000000E+00	-4.7769457	8.9209831	7.8093
380	9.2061060	0.00000000E+00	-4.8947597	14.100866	12.682
381	8.9686008	0.00000000E+00	-4.9586571	13.927258	12.514
382	3.3701913	0.00000000E+00	-1.3112153	4.6814066	4.2094
383	3.3701913	0.00000000E+00	-1.3112153	4.6814066	4.2094
384	2.8371656	0.00000000E+00	-2.0928687	4.9300343	4.3089
385	9.4986821	0.00000000E+00	-4.0934099	13.592092	12.305
386	9.0807775	0.00000000E+00	-4.9865900	14.067367	12.536
387	8.7211059	0.00000000E+00	-4.7023773	13.423483	11.890
388	6.5880366	0.46761992E-01	-2.2545060	8.8425426	7.9823
389	7.3404191	0.45761992E-01	-2.1946256	9.5350447	8.6659
390	9.3600878	0.00000000E+00	-2.8123261	12.172414	11.055

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
391	5.6935471	0.71933702	-1.2247639	6.9183110	6.2842
392	9.1057923	0.00000000E+00	-5.6707528	14.776545	13.026
393	8.9208847	0.00000000E+00	-4.5925039	13.513389	11.992
394	10.169245	0.00000000E+00	-3.5898626	13.759108	12.378

395	10.952517	0.61422969E-01	-1.8214650	12.773982	12.000
396	9.6466412	1.3500137	-0.20238728	9.8490285	9.2125
397	6.3653596	0.00000000E+00	-1.1446629	7.5100225	7.0081
398	6.4798778	2.8115406	0.00000000E+00	6.4798778	5.7017
399	2.8263208	0.34973986	-0.85446243E-01	2.9117670	2.7288
400	2.5919609	0.00000000E+00	-0.36090815	2.9528691	2.7913
401	35.446447	0.00000000E+00	-1.5736112	37.020058	36.258
402	33.468021	0.00000000E+00	-1.6584155	35.126437	34.330
403	30.444971	0.00000000E+00	-1.1260704	31.571041	31.023

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
404	27.092402	0.00000000E+00	-1.7572750	28.849677	28.016
405	21.273018	0.00000000E+00	-1.9217479	23.194765	22.327
406	17.346352	0.00000000E+00	-1.0464425	18.392795	17.896
407	13.291768	0.00000000E+00	-1.2776890	14.569457	14.003
408	7.4185328	0.00000000E+00	-1.9639212	9.3824540	8.6692
409	7.2509234	0.00000000E+00	-1.2471554	8.4980789	8.0000
410	27.361207	0.00000000E+00	-1.2043114	28.565519	27.985
411	27.080299	0.00000000E+00	-1.2243779	28.304677	27.716
412	15.214564	0.11085955	-0.12040883	15.334972	15.220
413	15.214564	0.11085955	-0.12040883	15.334972	15.220
414	5.8785376	0.00000000E+00	-0.69205196	6.5705895	6.2757
415	25.344788	0.00000000E+00	-0.46343348	25.808222	25.579
416	21.981565	0.00000000E+00	-1.1944819	23.176046	22.612

***** POST1 NODAL STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= 0.00000E+00 LOAD CASE= 1
 SHELL STRESSES ARE AT MIDDLE

NODE	SIG1	SIG2	SIG3	SI	SI
417	15.552842	0.00000000E+00	-1.0003599	16.553201	16.101
418	12.719169	0.00000000E+00	-1.1102998	13.829669	13.320
419	12.016037	0.00000000E+00	-1.4574923	13.473529	12.839
420	7.6059090	0.00000000E+00	-0.50678316	8.1136922	7.8855
421	4.9498845	0.77365548	0.00000000E+00	4.9498845	4.6176
422	19.208634	0.00000000E+00	-1.7587787	20.367413	20.145
423	15.820742	0.00000000E+00	-0.97641732	16.797159	16.355
424	14.574615	0.00000000E+00	-1.9020514	16.476667	15.612
425	10.779332	0.00000000E+00	-2.4897059	13.269038	12.383
426	9.9759154	0.00000000E+00	-0.32471577	10.300631	10.142

MAXIMUMS

NODE	279	20	199	279	279
VALUE	51.638952	7.0516968	-43.750872	51.999999	51.47

Comment 7

The toughness requirements for the MSB steel are based on the analysis for 20-year-old fuel and the ambient temperature of -20°F. Therefore, -20°F will be specified as a minimum temperature for MSB handling. This specification will be added to Section 12 of the TR.

Comments 8 & 9

PSN has previously submitted responses to comments 8 (FAX of October 12, 1990) and 9 (letter of October 31, 1990). As stated in Response #2 of Attachment 2 to the October 31, 1990 letter, PSN believes that the deceleration load of 22 gs has been calculated using an overly-conservative stiffness for the foundation [per EPRI methodology (EPRI NP-4830)]. This results in an overly conservative target hardness number to be used in the ensuing calculations. The drop load is a strong function of this target hardness number. Based on the design of the ISPSI foundations for Wisconsin Electric Power, Consumers Power, Toledo Edison, a survey of other near term potential sites, and PSN's generic pad, PSN concludes that using a conservative but bounding foundation target hardness would significantly decrease the design drop load on both the VCC and the MSB. Furthermore, in all plants we have analyzed the roadways and auxiliary buildings that the cask might be carried back into after 20 years of storage are not nearly as stiff as the pad. Hence, the storage pad represents the limiting operating condition in terms of hardness. Therefore, in order to resolve the NRC staff concerns outlined in comments 8 and 9, we suggest including in the TR the technical specification for hardness of the surfaces where the VSC is stored or carried over. These are easy to evaluate and can be performed quickly by any utility as part of site specific license applications or 50.59 safety reviews (along with the site heavy loads and radiological reviews).

The following presents a discussion of this issue. The calculation package "Alternative Analysis of the VCC-24 5 ft Drop" submitted with the October 31, 1990 letter is used as Reference 1.

The controlling parameter for the horizontal drop/tipover is a moment capacity of the concrete cask section. This capacity has been previously calculated as 1,325 kips•in (please see calculation package WEP-109.002.15, Rev. 2). From Ref. 1, page 4 the maximum dynamic moment shall be

$$M_{\max} = 1,325/1.06 = 1,250 \text{ kips}\cdot\text{in},$$

where 1.06 is the resistance/force ratio determined from dynamic loading curves (page 5 of Ref. 1).

Therefore, the maximum deceleration level that the cask can accommodate (to meet ANSI 57.9) is

$$a_{\max} = 1,250 (22g/2,123) = 13 \text{ gs},$$

where 2,123 kips•in is the moment produced by a 22g load (as calculated on page 14 of WEP-109.002.15, Rev. 2) and since the relationship is linear the resulting 13 gs deceleration is obtained.

For the deceleration of 13 gs, the shear force in the concrete section will be

$$V = 11.7 \text{ kips} (13/22) = 6.9 \text{ kips},$$

where 11.7 kips is a shear force produced by 22gs (WEP-109.002.15, Rev. 2, p. 14).

Hence, the required capacity is

$$V = 6.9 \cdot 1.5 = 10.4 \text{ kips} < 39 \text{ kips},$$

where 1.5 is the required resistance/force ratio for shear as determined in Ref. 1, p. 5, and 39 kips is the concrete section capacity as calculated in WEP-109.002.15, p. 15.

Therefore, the concrete cask can withstand a maximum horizontal deceleration load of 13 gs and meet the Load Combination #6 of ANSI 57.9. Other loads do not add to the moment or shear from the drop because of their axisymmetric nature (as discussed in our FAX of October 2, 1990).

For the MSB, the deceleration level decrease from 22 gs to 13 gs (44 gs to 26 gs statically) will cause a proportional reduction of the stresses. Therefore, the maximum bending stress in the shell (drop combined with other loads, as applicable) will be

$$P_L + P_t = 71.8 \cdot (13/22) + 1.2 = 43.6 \text{ ksi}$$

With a corrosion rate of 0.003 in/year (as calculated by PSN earlier and discussed again below), the stresses after 50 years of storage will be

$$P_L + P_t = 43.6 [0.75 / (0.75 - 50 \cdot 0.003)]^2 = 68.2 \text{ ksi}$$

which is less than the allowable of 73.5 ksi.

The corrosion rate of 0.003 in/year estimated by PSN previously is higher than the NRC staff's value of 0.002 in/year for moderate marine environments. There is no steam present in the VCC annulus since the concrete inside surface is steel lined and the maximum exiting air temperature is only 193°F. The water in the concrete can evaporate only from the outside surface. The severe marine environment rate is also not applicable to the VCC because the cask does not get splashed by the seawater. Thus, the moderate marine environment is adequately conservative for the MSB, and the value of 0.003 in/year is justified.

Thus, both the VCC and MSB will meet the applicable codes with a deceleration level of 13g. The load is fully determined by the hardness of the impacted surface. Using EPRI

Report NP-4830, page 2-39 (for the 5 ft. drop) we obtain that in order to restrict the load to below 13 gs, the target hardness number of the foundation should not be more than 8,000.

Therefore, PSN suggests to include a technical specification for the storage pad and transfer roads in the Topical Report. The specification would state that the surface hardness number calculated in accordance with EPRI NP-4830 methodology shall not exceed 8,000. Please note that the hardness number for a real foundation (selected to bound Consumer Power's and Wisconsin Electric's storage pads) has been calculated as only 3,560. This calculation is presented in Ref. 1. Thus, there is adequate margin to cover other pad designs.

Comment 10

- (1) The calculations for Figure 11.2-6 was done for the most reactive unburned, reactor fuel, CE 15 x 15.

The results shown in Figure 11.2-6 include all uncertainties discussed in Section 6.0 of the TR.

Assembly Location
Water Density
Fuel Homogenization
KENO-IV Bias
2 Sigma

The calculation estimated the 5.0% point using the KENO calculated point at 4.2 and the Δk /ppm calculated from all the KENO calculations.

- (2) It is our understanding that the discussion on the potential for boiling sent to the NRC on November 7, 1990 was acceptable. If this is not the case, please let us know at your earliest convenience.

Comment 11

In response to the differences between the MORSE and SKYSHINE calculated neutron dose rates we would like to point out that variations of 36 to 77 times are typical for neutron skyshine. Results are very dependent on calculational technique, source strength (was the peak or average surface dose rate used), geometry, detector location, meteorological conditions, etc. Such variations have been documented by the ANS committee on neutron skyshine. However, further work was not done because no one in the industry (NRC, EPRI and utilities) has determined from operating data that any excessive doses are coming from neutron skyshine. One can only assume that if such is the case then the lower calculated neutron dose rates must be closer to actuality than the

higher rates. PSN designed the VSC so that neutron doses are low enough such that even if such large variations were realized the doses would be within regulations.

We would also like to point out that the VSC has a lower neutron dose rate than any other metal dry storage cask and comparable to other concrete casks. The Table below shows this.

SURFACE NEUTRON DOSE RATE (mrem/hr)

	VSC	MC-10	GNSI* CASTOR 5	NUHOMS
SIDE	0.15	19.2	16	0.1 (top)
TOP	14.4	10	36	6.6 (front)
Area Weighted Average	2.2	17.2	21.6	2.9

* The CASTORs results are from measurement (EPRI NP-4887). The others are calculated.

The uncertainty in neutron dose rates is why PSN designed the concrete cask to yield such a low neutron dose rate.

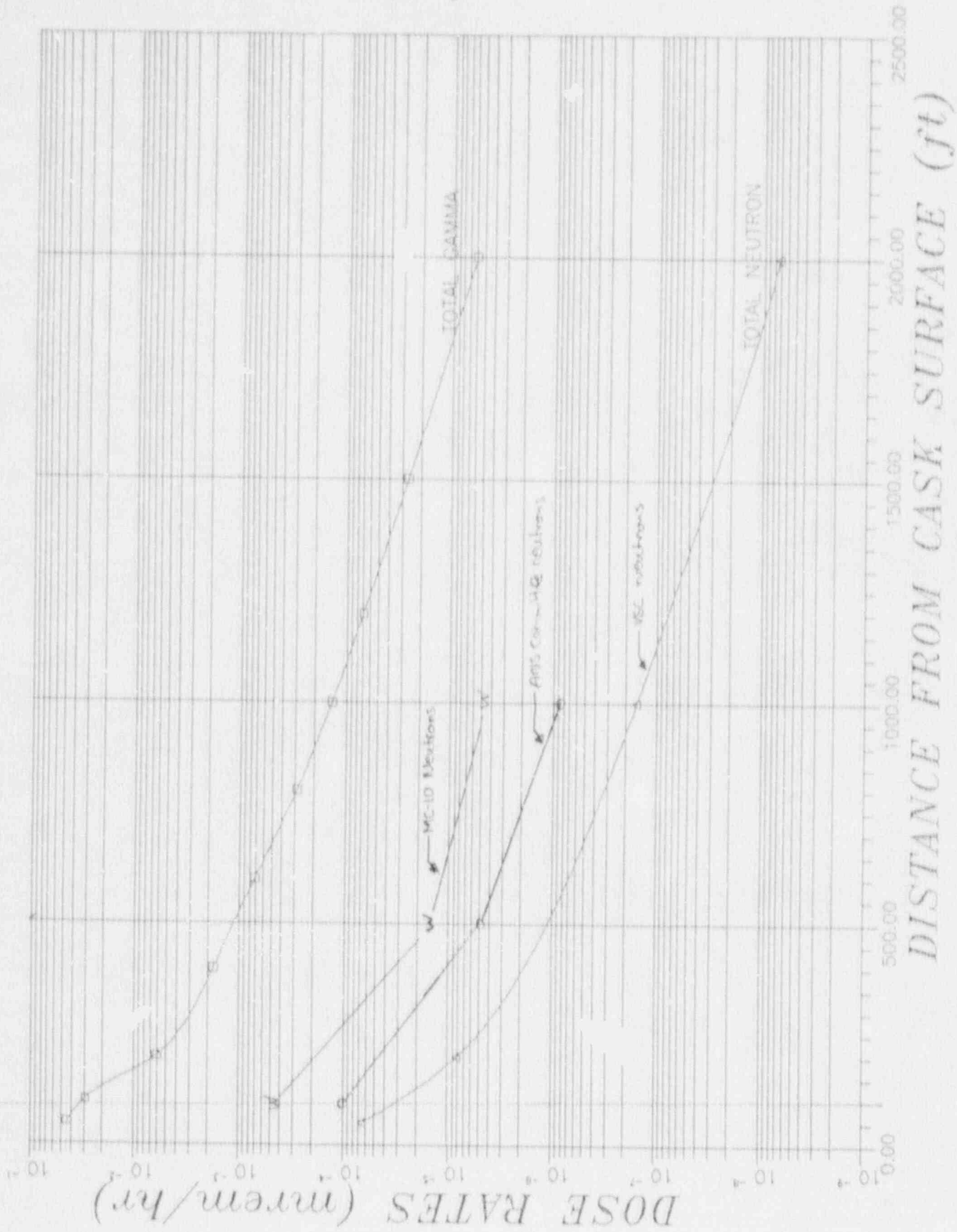
As a summary, Figure 1 shows a comparison between PSN's calculation, the ANS committee calculation and another dry storage technology topical (MC-10). The table above provides a comparison of the surface dose rates. The curves shown in Figure 1 are corrected by the product of surface dose rate times the area to account for source differences. While the VSC doses are lower than the other calculations they are within one order of magnitude variation from the results found by the ANS committee.

Furthermore, there are two very specific reasons why the VSC doses would be lower.

For the MC-10 metal cask:

- (1) The concrete VSC will have a much softer neutron leakage spectrum than the metal MC-10 cask. This could easily cause variations in skyshine of an order of magnitude or more.
- (2) Most all the VSC neutrons go through the top not the side. Thus, they are directed at 90° to the detector. This also can cause an order of magnitude or more difference.

FIGURE 1
 COMPARISON OF NEUTRON DOSES
 FROM AHS COMPOSITE, MC-10 and USC



For the ANS committee calculation:

- (1) Same as (2) above. Specifically, the ANS cask had a side dose of 10 mrem/hr. Two orders of magnitude higher than the VSC.

Of the above reasons why the VSC doses are lower than the doses from other cask, #2 is the most convincing. Our data shows decreases by two to three orders of magnitude if the source is directed at right angles to the detector. Metal cask, NUHOMs and the ANS Committee Cask all have substantial side sources.

Also, in regard to the question of the gamma dose rate: Figure 2 is presented to show that our calculation compares excellently with other calculations.

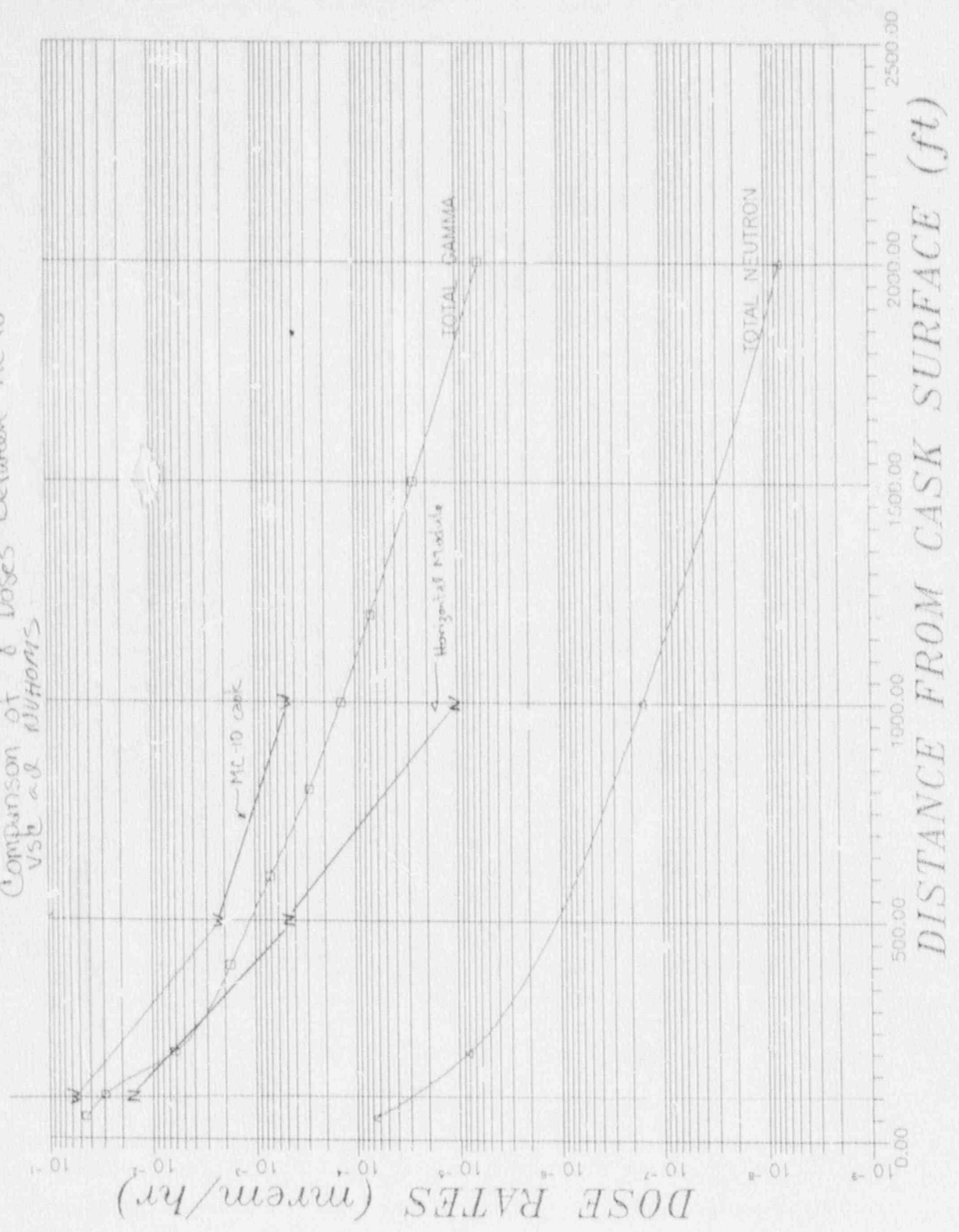
Sources were similar for all casks as shown below.

SURFACE DOSES (mrem/hr)

	Horizontal Module	MC-10	VSC	GNSI
Side (front)	10	43	11	24
Top (roof)	14	11	19.5	36

In closing, we have validated our SKYSHINE analysis against other calculations for both neutron and gamma radiation as evidenced by the enclosed graphs. As our surface doses are lower than other, already licensed casks, we believe this to be sufficient.

Figure 2
Comparison of γ Doses Between MC-10
vs. a. & NUHOMIS



III. DRAWINGS

Comment 1

The drawing has already been changed to correspond with Figure 3.4-1.

Comment 2

The note will be added to the referenced drawing.