



**Fig. 176 Optimized unstiffened equivalent ellipsoidal shell with thick apex,  $t(\text{apex})=0.4$  inch;  $W_{\text{imp}}=0.2$  inch; the optimum design is listed in Table 78.** The results plotted along the horizontal axis correspond to the cyclic application of load set B (PB). All the other results correspond to the application external pressure (PA). The four traces that have peaks at approximately  $w = 0.25$  inch correspond to the shell with a linear buckling modal imperfection of amplitude,  $W_{\text{imp}}=0.2$  inch, and with  $n = 1$  circumferential wave. (See Figs. 148 and 179). The remaining 4 traces are for the shell with a residual dent generated by a pressure concentrated on a single finite element.