



Fig. 200 Elastic-plastic analysis of the **optimized unstiffened equivalent ellipsoidal shell with the thick apex with $t(\text{apex}) = 0.4$ inch; $W_{\text{imp}} = 0.2$ inch; the optimum design is listed in Table 78.** Collapse of the imperfect shell with four different kinds of imperfections. trace 1= imperfection is a residual dent caused by a single concentrated load (Fig. 171); trace 2 = imperfection is a residual dent caused by a “ $\cos(\theta)$ ” distribution of concentrated imposed normal **loads** along a circumferential line from $\theta = 0$ to 90 degrees (Fig. 186); traces 3 and 4 = imperfections are residual dents caused by a “ $\cos(\theta)$ ” distribution of concentrated imposed normal **displacements** along a circumferential line from $\theta = 0$ to 90 degrees (Fig. 197), and trace 5 = a linear buckling modal imperfection with $n=1$ circumferential wave (Figs. 190 and 191). Notice the similarity between traces 2 and 4. Compare with Fig. 188.