

cases the agreement gradually deteriorated for angles below $\pm 100^\circ$ while, in other cases, agreement was remarkably good to $\pm 40^\circ$. Below this, agreement was generally poor except in a region between $\pm 3^\circ$ and $\pm 6^\circ$ where the theoretical and simulated curves crossed.

As pointed out previously, for Atlas pad locations at the Cape essentially all significant population centers (except ships) are located in the sectors from $\pm 100^\circ$ to $\pm 180^\circ$. Thus any B with the corresponding best-fit value of A can be used to compute launch-area risks, irrespective of the assumed breakup $q\alpha$. In unusual cases at the Cape or at other launch locations, population centers may be located outside sectors of good agreement for some B's. If such situations arise, a value of B should be used in the risk calculations that produces the best fit over the largest sector possible, generally $\pm 40^\circ$ to $\pm 180^\circ$. The values of B producing this result are listed in Table 22 as functions of breakup conditions.

Table 22. Best-Fit Conditions for Atlas IIAS

Breakup Conditions	B	A
none	50,000	3.15
20,000	100,000	4.30
10,000	100,000	4.75
5,000	5,000,000	6.30

Although the selected values of A produce poor agreement in the sectors from 0° to $\pm 40^\circ$, this does not mean that good agreement in this region is impossible. Instead, it means that the value of A required to produce good agreement in the $\pm 40^\circ$ sectors will produce poor agreement elsewhere. In special situations where the only population centers of interest are within $\pm 40^\circ$ of the flight line, other values of A can be derived for use in the risk calculations.

From a practical standpoint, the effort required to find a value of A that produces a better fit within $\pm 40^\circ$ or so of the flight line is unnecessary. Within this sector, the Mode-4 failure response, which is almost 11 times more likely to occur than a Mode-5 response, totally dominates the computed risks. As verification, the DAMP program was run for the Atlas IIAS vehicle, and ship-hit contours plotted for three vastly different pairs of A's and B's. The results are shown in Figure 16 through Figure 21, where the total failure probability during the first two minutes of flight was assumed to be 0.04, and the probabilities of Mode-4 and Mode-5 responses were 0.033 and 0.005, respectively. For each A and B, ship-hit contours were computed for Mode 5 alone, and then for all response modes. As expected, some downrange extension occurred in the Mode-5 contours as the value of A was increased, since the higher the value of A, the more concentrated impacts are near the flight line. When all response modes were included in the calculations, contour differences were almost imperceptible, showing the total dominance of Mode 4. If the calculations were remade with a Mode-4