# 7. Potential Future Investigations

Because of contract limitations on funds and the deadline for publishing the report, certain interesting facets of the Mode-5 modeling process could not be fully investigated. Several such issues are listed below in considered order of importance:

(1) Effects on shaping constants A and B of using more precise breakup ($q\alpha$) conditions during malfunction-turn simulations.

(2) Effects on shaping constants A and B (and thus overall risks) if different values of $T_B$ are used in computing theoretical and simulated impacts (e.g., $T_B$ corresponding to burnout of zero, first, and second stages).

(3) Effects on shaping constants A and B if drag is accounted for in computing free-fall impact points after a malfunction turn. (Shaping constants could be determined for maximum, minimum, and intermediate ballistic coefficients, then interpolated for other values. This more accurate approach would ultimately require extensive modifications to DAMP.)

(4) Effects on shaping constants A and B if sectors smaller than 5° are used to compare theoretical and simulated impact data (e.g., 1° or 2°).

(5) Effects on relative failure probabilities for solid-propellant vehicles if unclassified solid-propellant vehicles or declassified test results are used in the historical data samples (e.g., Pershing, Polaris, Poseidon, Trident).

Other tasks that should be performed at some point in the future include:

(a) Update absolute failure probabilities for Atlas, Delta, Titan, and perhaps other vehicles.

(b) Develop suitable shaping constants A and B for new vehicles. (In this regard, see Section 6.6)