response. Referring to Eq. (3), the right-hand member must be multiplied by the probability p_5 of a Mode-5 response to obtain absolute probabilities. Except for T_B itself (and to a slight degree, shaping constants A and B), the quantities in the equation do not depend on T_B. Thus if T_B and p_5 are both changed so that $p_5/(T_B - T_P)$ remains constant, the computed risks are unchanged.

If destruct action (i.e., impact limit lines) is included in the DAMP calculations, the supplemental risks* resulting from that action must be accounted for. In this case, the termination time has a minor influence on results, since it affects the number of impacts that would occur beyond the impact limit lines without destruct that are forced inside when destruct action is taken. If destruct action is omitted, the value of T_B is immaterial (i.e., supplemental Mode-5 risks are non-existent) provided that the impact range along the reference trajectory at time T_B exceeds the range to all targets of interest. (Except in this paragraph, supplemental Mode-5 risks are not addressed in this present report.)

d. Vacuum calculations: Atmospheric effects were accounted for in determining when vehicle breakup would occur and, to some extent, during each thrusting turn by using accelerations from the nominal trajectory. To reduce computer time and cost of this study, vacuum calculations were made during free fall after vehicle breakup or burnout. Although this increased impact dispersions somewhat, vacuum results should not be drastically different from those obtainable using a maximum-beta piece. In theory at least, different mode-5 shaping constants exist for each debris class. In view of the uncertainties in vehicle breakup conditions and characteristics, and in the overall process of simulating Mode-5 malfunctions, attempts to derive unique shaping constants for each debris class did not seem justified.

6.1.4 Malfunction-Turn Results for Atlas IIAS

For Atlas IIAS, the distribution of impacts for simulated random-attitude turns, slow turns, and a weighted combination (75% random-attitude and 25% slow turn) are shown in Figure 5. Since the impact distribution (i.e., the percentages of impacts in 5° sectors) for the weighted composite was not significantly different from that for random-attitude failures, slow-turn computations were not made for Delta, Titan, and LLV1.

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* See Ref. [1], Section 10.