

Appendix D. Launch and Performance Histories

D.1 Basic Data

In support of the empirical approach to use post-test results to estimate future vehicle failure rates, the performance histories for Atlas, Delta, Titan, and Thor missiles/vehicles were studied. Results are summarized in Appendix D as follows:

Appendix D.2: Atlas Launch and Performance History

Appendix D.3: Delta Launch and Performance History

Appendix D.4: Titan Launch and Performance History

Appendix D.5: Thor Launch and Performance History

The histories include all Atlas, Delta, and Titan launches from the Eastern and Western Ranges prior to 1 September 1996. For Thor, only Eastern Range launches are included, since this summary was completed before it was decided not to use Thor results in predicting failure probabilities for Delta. The Atlas, Titan, and Thor summaries include both weapons systems tests and space flights, while the Delta summary includes only space flights.

For each vehicle, each section of the appendix is divided into two parts:

- (1) A tabular summary listing all launches in chronological order by sequence number, a mission identifier, launch date, vehicle configuration, launch range, the failure-response mode to which any failure has been assigned, the flight phase in which the failure or anomalous behavior occurred, and a configuration flag (0 or 1) indicating whether the vehicle is sufficiently representative of current vehicles to be included in the data sample used to predict vehicle reliability.
- (2) A brief narrative – necessarily brief in most cases due to lack of information – describing the general nature of the failure or the behavior of the vehicle after failure, or the effects of the failure on flight parameters.

D.1.1 Data Sources

The vehicle performance summaries and histories were collected primarily from the following sources:

- (1) "Eastern Range Launches, 1950 - 1994, Chronological Summary", 45th Space Wing History Office.^[7]
- (2) Extension to (1) updating the launch summary through 30 December 1995.^[8]
- (3) "Vandenberg AFB Launch Summary", Headquarters 30th Space Wing, Office of History, Launch Chronology, 1958 - 1995.^[9]