

FAULT TREE ANALYSIS METHOD

The fault tree analysis (FTA) method is used to perform reliability and safety analyses of engineering systems. It was originally developed to analyze the Minuteman Launch Control System in the early 1960s at Bell Laboratories. It can also be used to perform analysis of human error in maintenance. The following examples demonstrate the application of FTA in maintenance with respect to human error.

Assume that an engineering system can fail due to a maintenance error caused by factors such as poor equipment design, inadequate training, poor work environment, use of deficient maintenance manuals, or inadequate work tools. Two major factors for poor equipment design are oversight or no formal consideration of the occurrence of maintenance error. The “no formal consideration to the occurrence of maintenance error” factor can be caused by either no requirement in design specifications or insufficient allocated funds.

Two important factors for poor work environment are inadequate lighting and inaccessibility. Similarly, two main causes for the use of deficient maintenance manuals are unavailability of compatible maintenance manuals or poorly written maintenance procedures.

Develop a fault tree for the top event “Engineering system failed due to maintenance error.” Figure 8.6 shows a fault tree for the example.