



30,000-foot-level Charting: Infrequent Failures

By Forrest W. Breyfogle III

When count data occur infrequently, the time between events can be monitored over time for stability and then, if the process were stable, provide a prediction statement.

Traditionally, a c-chart methodology would be used to track count data over time to determine if special-cause events occur, which need to be addressed; however, there are issues with this approach as described in [C-chart: Issues and Resolution](#).

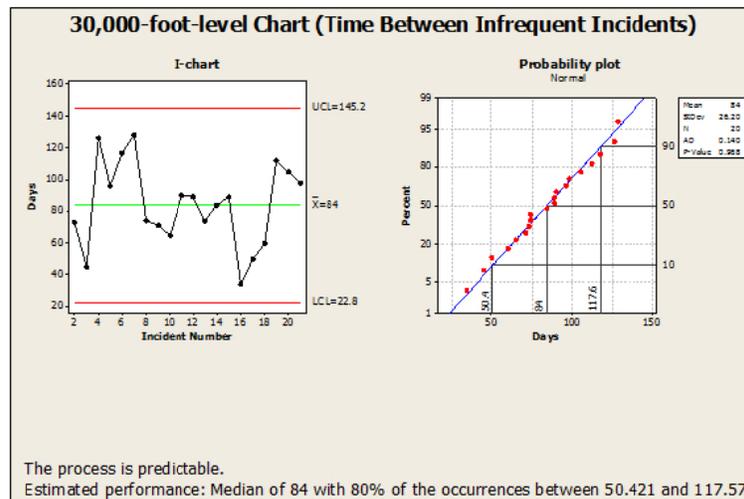
To illustrate an infrequent failures analysis approach, the time between incidents data in Table 1 will be analyzed using a 30,000-foot-level charting methodology¹.

Failure Number	Days since Last Failure	Failure Number	Days since Last Failure	Failure Number	Days since Last Failure
2	73	9	71	16	34
3	45	10	65	17	50
4	126	11	90	18	60
5	96	12	89	19	112
6	117	13	74	20	105
7	128	14	84	21	98
8	74	15	89		

From Table 13.3, *Integrated Enterprise Excellence Volume III - Improvement Project Execution: A Management and Black Belt Guide for Going Beyond Lean Six Sigma and the Balanced Scorecard*, Forrest W. Breyfogle III, Bridgeway Books/Citius Publishing, Austin, TX, 2008.

Table 1: Time Between Each Incident

A 30,000-foot-level chart of these data is shown in Figure 1.



Modification of Figures 13.8 and 13.9: *Integrated Enterprise Excellence Volume III - Improvement Project Execution: A Management and Black Belt Guide for Going Beyond Lean Six Sigma and the Balanced Scorecard*, Forrest W. Breyfogle III, Bridgeway Books/Citius Publishing, Austin, TX, 2008.

Figure 1: 30,000-foot-level Chart of Time between Incidents²

This chart indicates that our process is predictable with an estimated mean time between incidents or mean time between failure (MTBF) rate of 84 days with 80% of the incidents (i.e., 4 out of 5 times) occurring between 50.4 and 117.6 days. This value could be converted to an average annual or monthly incident rate.

Reference the article [C-chart: Issues and Resolution](#) for a more detailed explanation of the methodology summarized in this paper.

Summary

The estimated time between failures or incidents can be expected to be about the same in the future unless something changes. To improve a process' common-cause level of performance when reported at the 30,000-foot-level, the process needs to be enhanced; e.g., through a [Lean Six Sigma](#) improvement project. This approach to improvement project creation would be a 30,000-foot-level metric pulling (using a Lean term) for an improvement project creation.

30,000-foot-level Charting Applications

The described 30,000-foot-level charting technique has many applications, as described in [30,000-foot-level Performance Reporting Applications](#).

References

1. Forrest W. Breyfogle III, *Integrated Enterprise Excellence Volume III - Improvement Project Execution: A Management and Black Belt Guide for Going Beyond Lean Six Sigma and the Balanced Scorecard*, Bridgeway Books/Citius Publishing, 2008
2. Figure created using [Enterprise Performance Reporting System \(EPRS\) Software](#)

About the Author
Forrest Breyfogle, III
Integrated Enterprise Excellence



In a professional career spanning over a quarter century, Forrest Breyfogle has established himself as a leading edge thinker, a prolific author, an innovative consultant, a world-class educator, and a successful business executive. His work is documented in eleven books and over ninety articles on the topic of quality improvement.

A professional engineer, Forrest is also a member of the board of advisors for the University of Texas Center for Performance Excellence. He is the founder and CEO of Smarter Solutions, Inc., an Austin, Texas based consulting firm offering business measurement and improvement consultation and education to a distinguished list of clients worldwide, including BAMA, CIGNA, Dell, HP, IBM, Oracle Packaging, Sherwin Williams, Cameron, TIMET, and TATA. He served his country on active

duty in the US Army for 2 years, and has played an active leadership role in professional and educational organizations. Forrest received the prestigious Crosby Medal from the American Society for Quality (ASQ) in 2004 for his book, *Implementing Six Sigma* (second edition). This award is presented annually by the American Society for Quality to the individual who has authored a distinguished book contributing significantly to the extension of the philosophy and application of the principles, methods, or techniques of quality management. Mr. Breyfogle was named Quality Professional of the Year for 2011 by Quality Magazine and in 2012 was awarded alumni of the year by Missouri University of Science and Technology.

He is a widely recognized authority in the field of management improvement and is a frequent speaker before professional associations and businesses. His earlier work in the field of management science has been widely acclaimed. A previous book, *Implementing Six Sigma*, sold over 40,000 copies and still ranks among the top Amazon books in Applied Mathematics/Engineering Statistics and Industrial Engineering /Quality Control.

He founded Smarter Solutions in 1992 after a 24-year career at IBM. The associates of Smarter Solutions specialize in helping companies throughout the world improve their bottom line and customer satisfaction through the implementation of techniques that are beyond traditional Lean Six Sigma and the balanced scorecard methodologies. His latest and most extensive work has been in the documentation of a new system of enterprise management, the Integrated Enterprise Excellence (IEE) system, in a series of four books. IEE provides a detailed roadmap that builds on and integrates the best practices of earlier disciplines like Six Sigma, Lean, TQM, PDCA, DOE, and TPS combined with innovative analytical tools to produce improvements at the highest level of an enterprise.

In addition to assisting hundreds of major clients in the wise implementation of improvement systems worldwide, Forrest has also developed over 300 hours of classroom instruction used to train executives, managers, and Black Belt practitioners to plan for, implement, and manage IEE systems. He also leads formal seminars and workshops worldwide.

Forrest Breyfogle
forrest@smartersolutions.com
512-918-0280 x401
www.smartersolutions.com