

**HARNESSING THE POWER OF FAILURE:  
USING STORYTELLING AND  
SYSTEMS ENGINEERING TO ENHANCE  
ORGANIZATIONAL LEARNING**

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# **HARNESSING THE POWER OF FAILURE: USING STORYTELLING AND SYSTEMS ENGINEERING TO ENHANCE ORGANIZATIONAL LEARNING**

BY

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INVESTOR IN PEOPLE

John Steven Newman

~

For my Mary, Scott, and Matt

Stephen M. Wander

~

To my beloved wife Sandy, "Until we meet again."

And for my children, ShariLynn, TariLee, CJay

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The System Failure Case Study (SFCS) concept evolved from the notion of “hind casting,” or learning from failure events - a method Dr. Newman encountered in class at George Washington University in the Fall of 1999 (Risk and Crisis Management). In early 2000, the first prototype system failure case studies were developed based on a series of Titan IV launch mishaps. While addressing other issues, including support to the Columbia Accident Investigation (2003), the authors together evolved the SFCS to incorporate an increasingly sharp systems engineering “lens.” In the post-Columbia accident era, with an increased emphasis on knowledge management and lessons learned activities, the SFCS format underwent further evolution and development. The National Aeronautical and Space Administration (NASA), Review and Assessment Division (RAD) began developing and widely disseminating SFCSs in the 2005 time frame, employing NASA’s first operational knowledge management system. We wish to salute our colleagues in the RAD and the Office of Safety and Mission Assurance (OSMA) who supported SFCS implementation, in particular, Mr. John Castellano, and Mr. Bryan O’Connor, NASA Chief Safety Officer. We would also like to recognize Bryan for his ‘thought leadership’ relevant to safety, mission assurance, and organizational accountability in high reliability organizations (HRO). In developing our roadmap to harnessing the power of failure we draw on HRO philosophy evolved from leaders in the aerospace community but also derived from the joint NASA/Navy Benchmarking Exchange (NNBE) (2000–2003). In particular, we acknowledge our Navy counterparts, Messers Al Ford, Jimmy Lawrence, and Storm Kauffman for their valuable insights related to safety and risk management within the Navy nuclear propulsion and SUBSAFE programs. Most recently, we have had the opportunity to gain deep insights into the Navy Strategic Systems Program high reliability assurance culture and focus on multilevel leadership and human element weakness. We thank Vice Admiral Terry Benedict and Mr. Steve Zavadil for their valued time and effort in meeting with us. Very special thanks is extended to Mr. Don Vecellio, a long-time and valued colleague, for his

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## About the Authors

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# Prologue

*A quick navigational tip* – The authors have attempted and intended that each part of this text stand on its own with respect to focus, structure, and informational content. Accordingly, it is not necessary nor required to read or review all the case studies presented in Part II before proceeding to other parts – ‘analysis,’ ‘organizational examples,’ ‘system engineering tools and techniques,’ or ‘teaching models and methods.’ It is, indeed, up to the needs and desires of the reader. So, feel free to pick and choose the cases of greatest interest – then move on through the rest of the book cycling-back at any point to explore additional cases.