

**BOOK REVIEW**  
***Enterprise Risk and Opportunity Management:***  
***Concepts and Step-by-Step Examples for Pioneering Scientific and Technical Organizations***  
**By Allan S. Benjamin, PhD**  
**John Wiley & Sons, Inc., 2017**  
**324 pages**

Allan Benjamin has written a masterful book on applying ERM systematically at agencies such as NASA “whose principal objective is to develop and implement risky technologies for scientific and technical gain.” Dr. Benjamin calls these organizations “Technical, Research, Integration, and Operationalizing enterprises,” or TRIO organizations. They include government agencies, nonprofits, and for-profit companies.

The book is detailed and specific, offering charts, templates, and case studies to help the reader understand how to apply ERM rigorously to achieve a solid balance of risks and opportunities. The book’s ten chapters include (1) an ERM primer for TRIO organizations, (2) integration of ERM with management activities, (3) ERM processes and analytic approaches, (4) developing and using ERM templates in performance evaluation and strategic planning, (5) managing and implementing ERM in technical centers or directorates, (6) special ERM considerations at commercial TRIO organizations, (7) case studies of ERM informing risk acceptance decisions, (8) independent appraisal of ERM processes and results to ensure adequacy of internal controls, (9) overview of potential integration of ERM with other strategic assessment activities, and (10) an integrated framework for hierarchical internal controls.

For its target audience at TRIO organizations this is an outstanding book. TRIO organizations differ from others in the degree of uncertainty in making progress to achieving their objectives. They “must continually assess whether their strategic objectives continue to be achievable as conditions evolve...” The book thus spends considerable time showing the reader how ERM can address “unknown and underappreciated risks,” so-called “UU risks.” Especially instructive is the book’s presentation of qualitative and quantitative analysis and the elegant way that simple rating scales can help to address UU risks and others that don’t naturally lend themselves to quantification.

ERM practitioners recognize the need to balance risks and rewards and to include opportunities in the ERM analysis. For TRIO organizations, this is even more imperative: their success depends on seizing opportunities to devise new approaches to overcoming obstacles. As then-NASA Administrator Charles Bolden emphasized, for NASA, “risk intolerance is a guarantee of failure to accomplish anything of significance.” Dr. Benjamin explains that the book’s title, *Enterprise Risk and Opportunity Management*, or what he calls “EROM” instead of ERM, reflects the need “to expand our thinking regarding [ERM] from one that is centered on reducing risks to one that includes recognizing, cultivating, and exploiting opportunities.”

Culturally, this book is written for a TRIO scientist or engineer. There are 77 figures on topics such as “risk and opportunity leading indicator triggers” and “integration of qualitative and quantitative modeling to evaluate the likelihood of success of a commercial trio enterprise,” and

45 tables on topics such as “published guidelines for roughly estimating the ratio of the system failure probability from UU risks to the system failure probability from known risks at the time of initial operation.” These turn out to be quite helpful supplements to the written text, although their full scope is most useful for risk managers at TRIO organizations. The figures and tables nicely illustrate points made in the text, and a companion website provides them in color.

For those willing to enter the culture, this book offers substantial rewards. Insights abound. One section discusses the influence of external stakeholders in setting strategic objectives of the organization and the value of ERM in educating them about the risks of their decisions:

“informing external stakeholders and funding entities about the achievability of various strategic objective alternatives so that these stakeholders can make informed decisions about which objectives to mandate....While stakeholders...may have different views from the TRIO enterprise about what constitutes gain and what level of opportunity is significant, a majority can agree on whether the risk of not being able to achieve an objective is intolerably high so long as the case is laid out plainly and accurately.”

A chapter on risk acceptance decisions notes the need to ensure good information flow between an agency and its contractors, and also independence of the quality assurance process:

“Without open and effective communication among the contractors and between the contractors and NASA, there could be substantial risk that the assurance process will miss accident scenarios that emanate between interactions between subsystems, or will miss solutions that require a collaborative mindset. Furthermore, independence between the providers and those assuring the product is a best practice that needs to be maintained.”

The discussion of interplay between ERM and internal controls is particularly helpful, including discussion of Circulars A-11 and A-123, the Green Book, COSO, and other frameworks:

“Within the context of [ERM] internal controls can be viewed as processes that the organization decides to implement to provide defense-in-depth against risks and to promote successful achievement of its strategic goals and objectives....Internal controls focus on processes, procedures, and protocols that make it possible for the overall set of responses to succeed.”

This book is just off the presses so that it includes a discussion of A-123 and how to prepare a risk profile.

Dr. Benjamin has had over fifty years of experience in the design and analysis of complex systems. *Enterprise Risk and Opportunity Management* builds on his expertise with risk management at NASA, DoD, DOE, two national laboratories, and various prime contractors. He has contributed to works such as “Developing Probabilistic Safety Performance Margins for Unknown and Underappreciated Risks,” “The Role of NASA Safety Thresholds and Goals in Achieving Adequate Safety,” and the *NASA System Safety Handbook*. He knows his material and

lays it out with precision and logic. Even those of us not part of a TRIO culture can appreciate what a fine book he has written. And there is much for us to learn from it as well.

- Review by Thomas H. Stanton  
[Tstan77346@gmail.com](mailto:Tstan77346@gmail.com)  
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