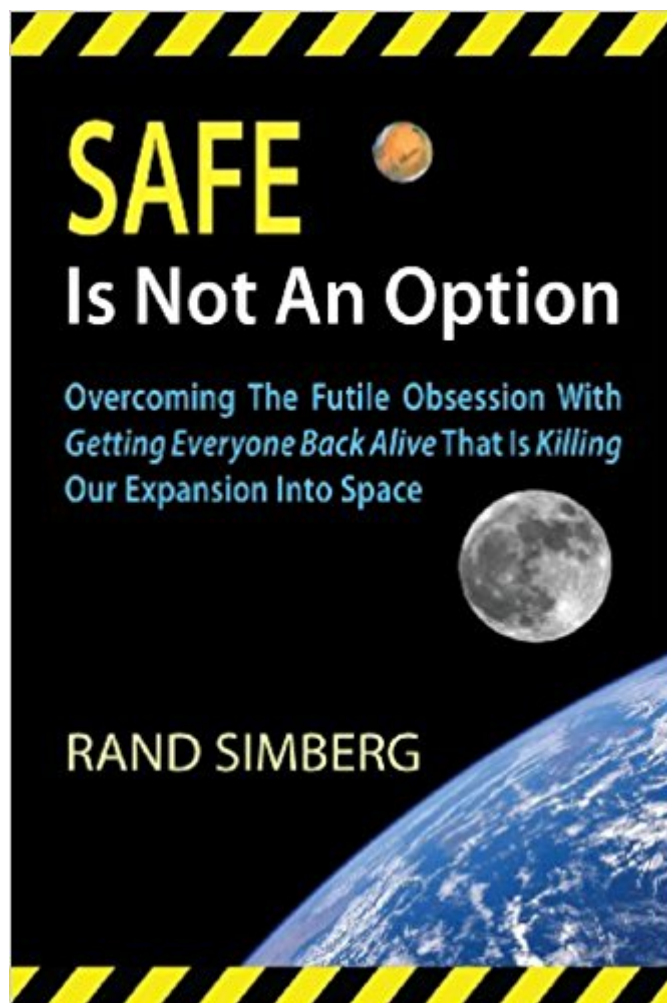


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# Safe Is Not An Option



## Synopsis

The history of exploration and establishment of new lands, science and technologies has always entailed risk to the health and lives of the explorers. Yet, when it comes to exploring and developing the high frontier of space, the harshest frontier ever, the highest value is apparently not the accomplishment of those goals, but of minimizing, if not eliminating, the possibility of injury or death of the humans carrying them out. For decades since the end of Apollo, human spaceflight has been very expensive and relatively rare (about 500 people total, with a death rate of about 4%), largely because of this risk aversion on the part of the federal government and culture. From the Space Shuttle, to the International Space Station, the new commercial crew program to deliver astronauts to it, and the regulatory approach for commercial spaceflight providers, our attitude toward safety has been fundamentally irrational, expensive and even dangerous, while generating minimal accomplishment for maximal cost. This book entertainingly explains why this means that we must regulate passenger safety in the new commercial spaceflight industry with a lighter hand than many might instinctively prefer, that NASA must more carefully evaluate rewards from a planned mission to rationally determine how much should be spent to avoid the loss of participants, and that Congress must stop insisting that safety is the highest priority, for such insistence is an eloquent testament to how unimportant they and the nation consider the opening of this new frontier.

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## Customer Reviews

“Thoughtful, comprehensive, yet iconoclastic – Safe Is Not An Option succinctly addresses the unrealistically skewed risk-reward perception in the civilian government space sector.

Speaking as a military aviator and astronaut, I believe this work wisely highlights the shortfalls of the NASA management not-truly-operational culture and offers a productive and realistic alternate viewpoint for anyone pursuing the “ad astra” dream. Rick Searfoss Colonel, USAF Retired, Astronaut/Space Shuttle Commander, XCOR Aerospace Chief Test Pilot. “In 2008 I had the great privilege to fly privately to the International Space Station, where I lived for twelve days. Having grown up with a NASA astronaut father who flew on Skylab and the Shuttle, I have had a lifetime opportunity to see how flight safety has evolved in the United States. Having trained in and flown aboard the Soyuz, I have also seen the Russian approach to this same important issue. The two hardest items to control in space exploration are cost and safety. Interestingly, the Russian approach has often created both improved safety and cost in comparison with domestic strategies. If we as a global people are going to push the boundaries of humanity further into the cosmos, we must decide how much risk we should accept and how should we manage to that level of risk. Today, we seem so risk averse that we encumber the already difficult problem of space exploration with red tape, that slows down the activities, requires spiraling budgets and arguably does not improve safety in relative measure. Richard Garriott Private Astronaut and Computer Game Pioneer. “Since the end of Apollo, U.S. space operations have ostensibly emphasized safety first. Rand Simberg persuasively explains why that has been a mistake, and how we must change if we are to succeed. Glenn Reynolds aka “Instapundit” Beauchamp Brogan Distinguished Professor of Law, University of Tennessee, and co-author Outer Space: Problems of Law & Policy. “A pioneer at the dawn of aviation observed: “If you are looking for perfect safety, you will do well to sit on a fence and watch the birds; but if you really wish to learn, you must mount a machine and become acquainted with its tricks by actual trial. And since ancient times it has been known that staying in the harbor is safer than venturing onto the high seas. But nature demands tolerance of risk if the human race is to expand beyond our world. Opening the space frontier to humanity will require no less acceptance than these historical precedents, as Rand Simberg ably illustrates. Gary C. Hudson President, Space Studies Institute. “Safe Is Not An Option makes a strong case for changing minds and policies about our risk-averse western society and approach to future commercial space exploration. It’s an excellent read. Rand tears the sheet off the elephant in the room and exposes us to the conversation in which western society must engage to remain relevant in the new millennium. The topic deserves discussion. This book is a valuable first step. Stuart O. Witt CEO, Mojave Air & Space Port. “Rand Simberg presents an intriguing case that the safety culture within the government space program, while well

intentioned, is in fact detrimental to the progress of space exploration and development. The no-holds-barred approach of his viewpoint is sure to disturb the status quo, but regardless is a captivating read. Whether you agree with his viewpoint or not, *Safe Is Not An Option* provides a necessary perspective for those involved in or connected to the space community.

— Michael J. Listner, Esquire Principal, Space Law & Policy Solutions, President & CEO (Interim) International Space Safety Foundation.

“NASA’s approach to manned space flight has created the impression that such travel is inherently extremely costly. In this new book, Rand Simberg makes a persuasive case that NASA’s unprecedented risk aversion is the cause of that high cost and that such risk aversion is contrary to the history not only of aviation but of all transportation and the exploration of new frontiers. This has profound implications for the development of commercial transportation in space. Simberg offers an alternative approach which could lead space transportation to develop into an industry along the lines of aviation, rather than remaining a tiny, costly government monopoly.”

— Robert Poole Director of Transportation Policy, Reason Foundation.

“Mr. Simberg makes the compelling case that great deeds and great rewards require great risks, but NASA and my colleagues in Congress have become so risk averse in the arena of human spaceflight that we are incapable of accomplishing great deeds. America must have the stomach to let explorers and settlers willfully take on the kinds of risk necessary for opening the frontier of space to settlement under the rule of law. If we continue to overvalue that risk, or prohibit those who would willfully undertake it, then other nations with no respect for human life will be more than happy to fill that void. Left unchecked, the well-meaning, but misguided, group that promotes “safety at all cost” will continue to establish hard ceilings that we cannot break through, require the expense of immense amounts of time and money, and will ultimately cost us our preeminence in space. We must not cede the high ground of space to those who do not believe in freedom. And we must respect the freedom of those individuals who are willing to put it all on the line to head over that next hill even when that hill is in space. Mr. Simberg’s book *Safe Is Not An Option* handles this sensitive issue with skill, grace, and tremendous insight.”

— Rep. Dana Rohrabacher Vice Chairman of the House Committee on Science, Space, and Technology; and former Chairman of the Space Subcommittee.

“My first thought upon reading a draft of Rand’s book was, ‘It’s about time that someone used common sense when addressing the space safety subject.’

— The biggest difference between NASA in the 60s and the current NASA is how they deal with risks. In the 60s, NASA developed and flew seven new manned space launch systems (Redstone, Atlas, X-15, Titan, Saturn I, Saturn V and LM). All except X-15

were flown without fatalities. In the forty-two years since, only three new systems were flown, one Chinese, the Space Shuttle and SpaceShipOne. In spite of new safety policies, NASA's Shuttle proved to be the most dangerous way to fly outside the atmosphere. In spite of the evidence, NASA still insists on following the Shuttle model in developing future systems, which clearly hampers creativity (opportunities for breakthroughs) while providing no real improvements in safety. I applaud Rand for publishing his important research on the safety culture. This book will be referenced widely in the future and will provide the sanity that is needed while we move ahead with new technologies.

• Burt Rutan Aircraft And Spacecraft Developer

Rand Simberg is a recovering aerospace engineer with over a third of a century of experience in the space industry. Early in his career, he accumulated over a decade of experience in engineering and management at the Aerospace Corporation in El Segundo, California and Rockwell International in Downey, California. Since leaving Rockwell in 1993, he has been a consultant in space technology and business development as well as a technology entrepreneur. He also advises on regulatory and market issues pertaining to commercial and personal spaceflight. Mr. Simberg holds multiple engineering degrees from the University of Michigan, Ann Arbor and a Masters degree in Technical Management from West Coast University in Los Angeles. He is an adjunct scholar with the Competitive Enterprise Institute, and has written many pieces for Popular Mechanics, Fox News, America Online, PJMedia, National Review, Reason magazine, The Weekly Standard, The Washington Times, and TCSDaily, among others. He has also written extensive essays on space policy and technology for the quarterly journal, The New Atlantis.

First, let me confess - I am a Safety Engineer on a manned spaceflight program. This book was recommended by one of my coworkers. It is obvious that the author is familiar with the various space programs over the decades as the facts he states are accurate. I could not agree more with his opinions regarding the "over the top" safety requirements that are being imposed. Having worked with several astronauts, I realize that they are not as risk adverse as are the program management that develops some of the outlandish safety requirements. We, as a country, have lost our pioneering spirit - we need to realize that exploration and seeking new frontiers does come with a certain amount of risk. By attempting to alleviate all risk through safety requirements, we are greatly increasing cost with requirements that don't result in quantifiable risk reduction. If you wonder why we have made little progress in space exploration over the last few decades, you should read this book.

This book is a winning combination of important and easy to read. It's important because it raises issues that lawmakers, policy makers, industry and prospective customers must all address, namely, what is our appetite for risk in space travel? The book starts with inspiring stories, many of which we are already familiar with, but when Simberg offers them as contrast to society's aversion to risk, it shows starkly how much we've changed since setting sail in wooden boats and facing a hostile continent. After showing the pitfalls of demanding perfect safety (which would mean we shouldn't get out of bed in the morning, much less launch rockets), Simberg raises an important issue that needs to be part of the public discussion. When the nation thought space was important, we were willing to take risks. All modes of transport carry risks, but we accept those risks because we need to get places. So, he asks, why do we need to go to space? He argues that the settlement of space is reason enough. The Commercial Space Launch Act would appear to support his thesis. There, Congress said "the goal of safely opening space to the American people and their private commercial, scientific, and cultural enterprises should guide Federal space investments, policies, and regulations." Finally, the writing is smooth, the explanations clear, and the arguments cogent. It's a quick read, and I highly recommend it.

This is an excellent book by somebody with the right background to write it. Somewhere in it he makes an analogy with the early days of flight. In the 1910s and 1920s a lot wasn't understood about airflight, like whether biplanes or monoplanes, or something else, was the better design, and whether to place the flaps in front of the wings or behind them. There was a lot of experimentation, and many accidents. Imagine if NASA (and the US Congress) had been around to manage progress, and after each accident they suspended airflight for 3 years while safety committees met and so on. We would still be flying biplanes - or perhaps not. The "red-tape" overheads might have killed off interest. I think the analogy hits the spot. When you don't really know what works, you want many opportunities to experiment. The US congress/NASA approach has meant that flights have been few, massively expensive, and at the end of the day, not safe anyway. And not much progress has occurred since the 60s. I recommend this book for anyone interested in space.

I'm a bit of a new space junkie, but this book really put into words why space exploration was so dead before the rise of commercial crew, SpaceX, and the like. Briefly, we were afraid to take risks, because no one seemed to actually value what we were doing. Missions turned into pork projects for the same reason: no one had their eye on the prize. This is a must read for anyone trying to

figure out why NASA's crewed missions just can't seem to get their \$&@& together of late, and it offers a prescription for our future in space: the abandonment of legacy hardware and legacy thinking.

Simberg ably tackles one of the most difficult topics in space exploration. It's not an engineering problem, but rather the unreasonable expectation that everybody must come back alive. The obsession with safety comes from a sort of reverence for astronauts and also from fear of losing expensive and sometimes irreplaceable hardware like the space shuttles. An obsession with safety is most easily satisfied by not flying at all; but if moving a few of our eggs off our one basket is important to the species (and it is) then we need to admit the risk inherent in space travel. High expectations of safety greatly increase the costs of spacecraft and launch vehicles (without necessarily resulting in the desired safety), so Simberg argues "safe enough" is a more rational standard. This is a great book that should spark many necessary discussions.

Wonderful book for anyone who works with NASA on a regular basis or who wants to be an educated citizen. Space travel as it is today wouldn't have been possible without NASA, but the same could also be said for the Cold War. Whatever brought us to today, this book offers a consolidated tail of the lessons to be learned from NASA and the reasons that private space (and/or a NASA structured much more like private space) is the future of spaceflight.

This book highlights an issue, safety, that is not just a problem in the space industry but has infiltrated the US at every level. As a country we have become so risk averse and concerned with safety that everything grinds to a halt. I recommend this book highly but I believe we need to look at more than just the space industry and begin to work at gaining that spirit of adventure that we used to have in all walks of life.

I've been reading Mr. Simberg's blog for years, so I had high expectations for this book. He did not disappoint. US space policy is a mess, and the current priorities will not lead us to long-term success. A significant change is necessary for us to truly become a space-fairing species. Mr. Simberg doesn't have all the answers, but this book points in the correct direction.

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