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Autore	McLeod Gary <1948->
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Nota di contenuto	Preface -- Figures -- Tables -- Summary -- Acknowledgments -- Abbreviations -- ; 1. Introduction: Background -- Objectives -- Scope -- Space resilience -- Approach -- Report structure -- ; 2. Resilience and civil institutions: General approaches for building resilient operations: Impact avoidance -- Adaptation and flexibility -- Recovery and restoration -- Potential applications to the space operations community -- Summary -- ; 3. Resilience and U.S. government civil space agencies: Civil policy considerations: Full and open access -- Rapid delivery -- Continuity of operations -- Security classification -- Civil practices: Information -- Organization and tactics -- Command and control -- Training -- Personnel -- Summary -- ; 4. Resilience and Air Force space operations: Operational concept -- Findings: information: Space order of battle -- Limited intelligence at SOPS/SWS -- Space knowledge of intelligence personnel -- Space Weather effects -- Summary -- Findings: organization and tactics: Space protection lead -- Space protection tactics -- Tactics-sharing -- Summary -- Findings: command and control: Satellite C2 contacts -- Responsibilities and authorities -- Anomaly resolution -- Summary -- Findings: training: Space protection training -- Exercises -- Multiple

satellite C2 systems -- Summary -- Findings: personnel: Initial qualifications -- Career progression -- Trained operators -- Summary -- Cost of implementation options -- Detailed recommendations -- ; 5. Resilience and a world with international and commercial partners: Information -- Organization and tactics -- Command and control -- ; 6. Recommendations: Overarching recommendations: Resilience as a priority -- Space protection CONOPS -- Detailed recommendations: Near-term recommendations -- Far-term recommendations -- ROM costs -- ; Appendix A: Space resilience cost analysis.

Sommario/riassunto

"Space is now a congested, contested, and competitive environment. Space systems must become more resilient to potential adversary actions and system failures, but changes to space systems are costly. To provide a complete look at resilience and possibly realize some benefit at lower cost, the Air Force asked RAND to identify non-materiel means--doctrine, organization, training, leadership and education, personnel, facilities, and policy--to enhance space resilience over the near and far terms. The authors developed implementation options to improve resilience based on a notional space protection operational concept: enhancing the capability of space operators to respond, in a timely and effective manner, to adversary counterspace actions. Operators need actionable information, appropriate organization and tactics, and dynamic command and control, supported by appropriate tools and decision aids, relevant training and exercises, and qualified personnel brought into the career field. The authors also recommend that Air Force Space Command develop a formal, end-to-end, space protection concept of operations (CONOPS) that captures all elements needed to improve resilience. In addition, the CONOPS could potentially follow the tenet of centralized control and decentralized execution in certain situations, such as when responding to adversary counterspace actions. For the near-term options, the rough order of magnitude (ROM) nonrecurring engineering (NRE) cost of implementation is estimated to be between $2.5 million and $3.6 million. For the far-term options, the ROM NRE cost is estimated to be between $109 million and $166 million, with the ROM recurring cost between $4 million and $5.4 million per year"--Publisher's description.