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NEO Mitigation Mission Assurance

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ABSTRACT

A planetary defense campaign to deflect an asteroid will require an agile mission assurance process to guarantee a high probability of success and reduce the potential of near-Earth objects (NEO) to cause massive destruction to cities and regions. Independent coordinated efforts by multiple nations will be necessary to provide redundancy because space missions are not 100% reliable due to their technical complexity. The paper draws from past anomalies to derive historical failure rates of major program phases to inform the mission assurance process. The paper also evaluates the space industry's ability to produce launch and space vehicles on tight schedules for required mitigation missions. To bound the problem, the scenario from the 2017 Planetary Defense Conference is used as a case study. The study will identify mission assurance gaps and organizational requirements for development of reliable space systems for NEO mitigation.