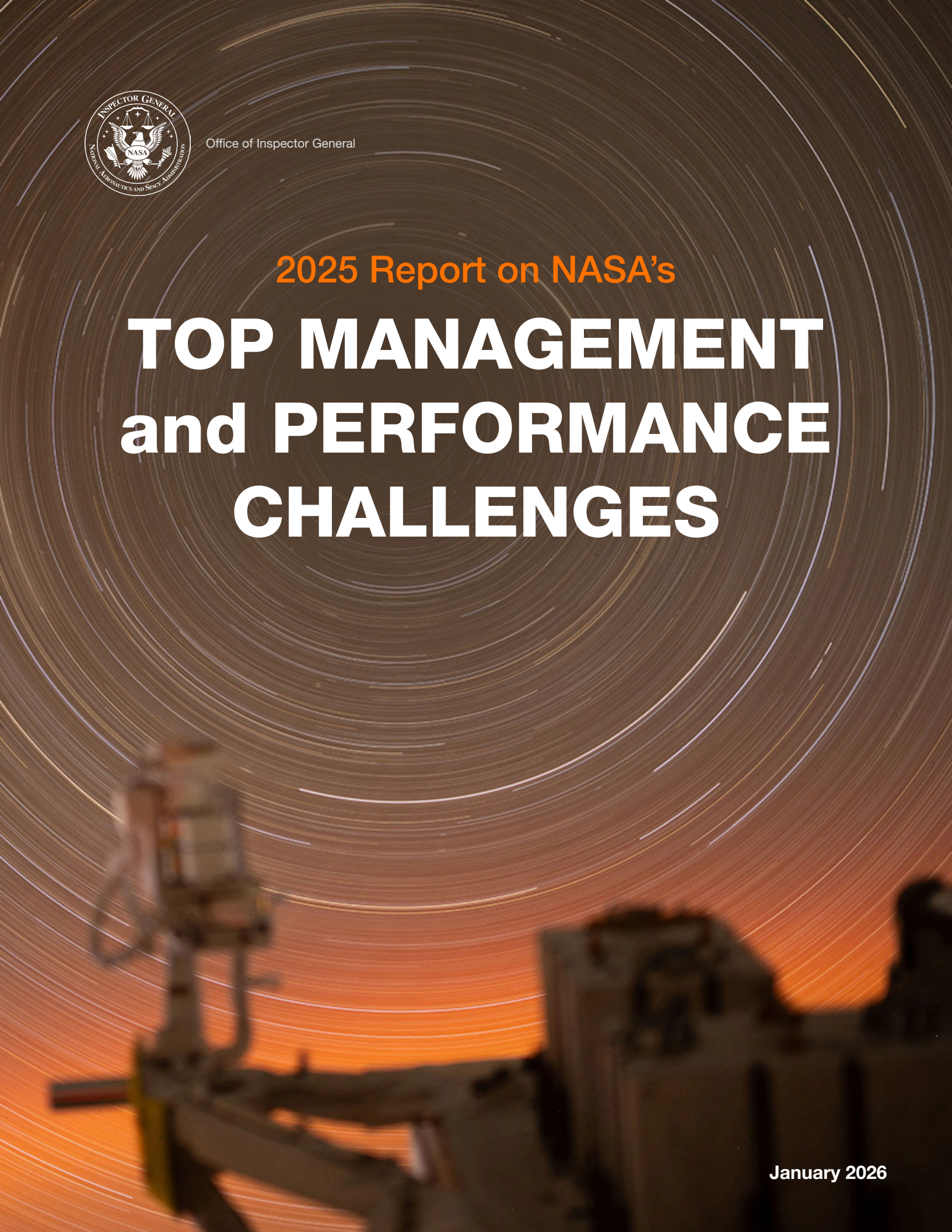
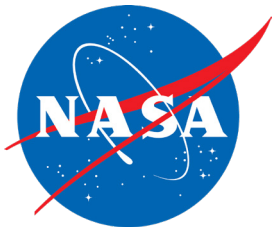
Office of Inspector General

2025 Report on NASA's

# TOP MANAGEMENT and PERFORMANCE CHALLENGES



January 2026




## Office of Inspector General

To report fraud, waste, abuse, or mismanagement, contact the NASA OIG Hotline or call at 800-424-9183 or 800-535-8134 (TDD). You can also write to NASA Inspector General, P.O. Box 23089, L'Enfant Plaza Station, Washington, DC 20026. The identity of each writer and caller can be kept confidential, upon request, to the extent permitted by law.

To suggest ideas or request future audits, contact the NASA OIG Office of Audits.

Cover photo: Long-exposure photograph taken from a window inside the International Space Station on July 26, 2025, capturing the circular arcs of star trails.
Source: NASA.

# TABLE OF CONTENTS

## MESSAGE FROM THE

# NASA OIG SENIOR OFFICIAL

As required by the Reports Consolidation Act of 2000, this annual report presents the NASA Office of Inspector General's (OIG) independent assessment of the top management and performance challenges facing the Agency. For the 2025 report, we identified five challenges.

**Challenge 1:** Returning Humans to the Moon

**Challenge 2:** Sustaining a Human Presence in Low Earth Orbit

**Challenge 3:** Improving Management of Major Programs and Projects

**Challenge 4:** Managing Cybersecurity Risks and Emerging Technology

**Challenge 5:** Sustaining Mission Critical Capabilities

The work of NASA stands as an iconic symbol of what the United States is capable of achieving. Since its inception in 1958, NASA scientists, technicians, and astronauts have defined and redefined the limits of science. Crews have been living in low Earth orbit (LEO) continuously aboard the International Space Station (ISS or Station) since 2000. Station crews conduct experiments only possible in the unique conditions of space, observe Earth as a system, and test new technologies that ultimately will help send humans far beyond Earth. Artemis missions will send humans to the Moon for long-term scientific exploration and discovery. Artemis I was an uncrewed flight test that traveled 40,000 miles past the far side of the Moon and back to Earth to validate the Space Launch System (SLS) heavy-lift rocket, the Orion Multi-Purpose Crew Vehicle (Orion), and other key systems. Artemis II, expected to launch no later than April 2026, will be the first flight test with astronauts to validate crew life support systems, and Artemis III will mark the beginning of humanity's return to the lunar surface.

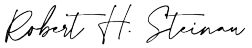
Science missions showed us new areas of the universe in stunning detail with the James Webb Space Telescope, analyzed samples from the asteroid Bennu, and captured images of Earth in a new spectrum of colors with the launch of the Plankton, Aerosol, Cloud, ocean Ecosystem satellite. NASA's aeronautical experts are leading a government-commercial industry team to collect data that could make supersonic flight over land possible, dramatically reducing travel time in the United States and abroad. Current technology demonstrations will enable NASA to mature cutting-edge, laboratory-proven technologies and new capabilities that will transform future science and space exploration goals.

Despite these capabilities and accomplishments, returning humans to the Moon, sustaining a human presence in LEO, improving management of major programs and projects, managing cybersecurity risks and emerging technology, and sustaining mission critical capabilities continue to present challenges to the Agency. In deciding whether to identify an issue as a "top challenge," we consider its significance in relation to NASA's overall mission; whether its underlying causes are systemic in nature; and its susceptibility to fraud, waste, and abuse. The five highlighted challenges are not the only significant issues that confront NASA, and identification of an issue as a top challenge does not denote significant deficiencies or lack of attention on the Agency's part. Rather, most of these issues are long-standing challenges central to core missions.

NASA's continued success will require constancy of purpose, long-term funding commensurate with the authorized Agency mission, a technically skilled workforce able to devote sustained effort to address challenging problems, and leading-edge equipment and supporting infrastructure that enable work at the forefront of science, engineering, and technology. Behind every mission NASA launches and milestone they reach, there is a budget that reflects the Agency's current priorities. On May 30, 2025, NASA released its proposed budget for fiscal year (FY) 2026. The intent of the budget is to keep NASA's return to the Moon on track while refocusing investments to ensure long-term lunar and Martian exploration efforts are sustainable and affordable, transition to commercial services for Artemis IV and beyond, and align the science and technology portfolios to missions and technologies essential for human exploration of the Moon and Mars. Furthermore, the proposed budget aims to streamline NASA's workforce, information technology (IT) services, NASA center operations, facility maintenance, and construction and environmental compliance activities. In FY 2025, NASA received $24.8 billion. The Agency's FY 2026 budget has yet to be approved but foreshadows reductions in both funding and workforce. Even with the uncertainty, NASA must continue to plan their path forward.

Throughout its history, NASA has demonstrated the ability to focus and adapt, enabling the boldest visions of research and space exploration. In every moment of that history, the Agency has been required to perform cost-benefit analyses of risks and consider various methods and paths to accomplish those missions. As part of its strategic decision-making, following the Office of Personnel Management's January 2025 offer of deferred resignation, the Agency offered civil servants a second opportunity for deferred resignation in June 2025 and granted voluntary early retirement authority in FY 2025. Additionally, the Agency plans to scale back or discontinue efforts not aligned with their Moon and Mars exploration priorities and reduce its facility footprint to improve operational efficiency. To enable its missions' continued success, NASA must maximize all of its assets; ensure knowledge is preserved and passed on to the next generation of scientists, engineers, and policy experts; and assure stakeholders that the Agency is consistently focused on its strategic priorities.

The OIG is committed to providing independent, objective, and comprehensive oversight to improve Agency outcomes. In FY 2025, the Office of Audits conducted 15 audits, identifying 54 recommendations aimed at improving NASA operations. The Office of investigations' work has resulted in civil settlements; criminal convictions; and debarments of NASA contractors, grantees, and individuals. In FY 2025, the Office of Investigations' total monetary impact was almost $7.3 million from criminal, civil, and administrative actions with approximately $1.4 million returned directly to NASA. We plan to conduct audits and investigations in the coming year that focus on NASA's continuing efforts to address these and other challenges.



Robert H. Steinau
Senior Official

Artemis II crew members view their Orion crew module inside the Neil Armstrong Operations and Checkout Building at NASA's Kennedy Space Center in Florida on August 8, 2023.

Source: NASA.

# RETURNING HUMANS TO THE MOON

With the Artemis campaign, NASA intends to return humans to the Moon and build a sustainable lunar presence as a foundation for future human exploration of Mars. In December 2022, NASA successfully completed Artemis I, which served as the first and only integrated uncrewed flight test of NASA's deep space exploration systems—the SLS's two-stage, heavy-lift rocket that launches the Orion capsule into space from the Exploration Ground Systems launch facilities. Since then, NASA has been analyzing mission data from Artemis I and preparing for a no later than April 2026 launch of Artemis II, the first crewed Artemis mission to orbit the Moon. Preparations are also underway for Artemis III, which will return humans to the lunar surface in mid-2027 utilizing a new Human Landing System and extravehicular spacesuits—both still in development. Artemis IV, scheduled for late 2028, will introduce Gateway, a lunar orbiting space station also in development. Artemis V, scheduled for 2030, will integrate a habitation and viewing module called the Lunar View element with Gateway and complete the third crewed lunar surface expedition.

Our past work has shown the Artemis campaign's substantial costs present significant challenges to its long-term sustainability. In 2021, we estimated NASA would spend $93 billion on the Artemis effort by FY 2025. Now at the conclusion of FY 2025, years of additional and substantial funding will be required before NASA achieves its next successful lunar landing. The downstream consequences of continued cost increases and schedule delays across Artemis programs and projects could ultimately compromise the Artemis campaign and NASA's mission as a whole.

Artemis cost increases have continued to take up a large portion of the Agency's total cost overruns. Of 53 NASA projects recently sampled by the Government Accountability Office, three Artemis projects accounted for almost $7 billion in cost overruns—almost 50 percent of the Agency total. Also critical to the Artemis campaign's success is NASA's partnerships with international space agencies, some of which provide system components required to return humans to the Moon. Further, 56 countries, including the United States, have signed the Artemis Accords, which seek to establish principles for cooperation among civil space agencies on the use of outer space.

The most time-sensitive challenge for NASA's effort to return humans to the Moon is preparing for Artemis II. NASA must address various challenges to safely fly the four astronauts to lunar orbit on their planned 10-day mission. While NASA considered Artemis I to be a

near-perfect flight, it revealed technical issues that need to be addressed before Artemis II can launch. Specifically, the ablative outer material of Orion's heat shield did not properly vent the gases normally produced during entry into Earth's atmosphere, leading to widespread cracking and char loss. Given NASA's current understanding of the root cause, the Agency intends to reuse the heat shield design for Artemis II while flying a modified reentry trajectory that is less severe. Although this approach is technically feasible, it is also complex and contingent on a successful test campaign and does not retire the heat shield risk for Artemis III. The additional heat shield testing resulted in cascading delays to all Artemis missions starting with Artemis II. Additionally, Mobile Launcher-1—the platform and tower that supports SLS launches—sustained more damage during Artemis I than expected. Although these damages have been repaired, with each launch there is the potential for new damage, and the launcher must be available through Artemis III.

Artemis III—the mission intended to return humans to the Moon's surface—is largely dependent on new technologies that are currently in development with NASA contractors. Space Exploration Technologies Corporation (SpaceX) is developing Starship for lunar landing services for Artemis III and IV. Prior to the crewed mission, SpaceX must conduct multiple flight tests, including a demonstration of the critical and never before done capability of on-orbit propellant transfer to refuel the Starship lander and an uncrewed demonstration to the lunar surface. As of August 2025, SpaceX had conducted 10 integrated flight tests of the Starship lander. While the initial six flights and the most recent flight experienced varying degrees of success, including controlled splashdowns of the booster and lander and a demonstration of SpaceX's ability to "catch" the booster at the launch pad using the launch tower arms, the seventh through ninth flights all experienced mishaps resulting in the loss of the lander.

Once astronauts land on the Moon during Artemis III, they will explore the lunar surface using spacesuits developed under the Exploration Extravehicular Activity Services contract. NASA initially awarded two contracts for this effort—to Axiom Space and Collins Aerospace. However, the Agency announced in June 2024 that Collins Aerospace would not continue work on its spacesuits, leaving the Agency with only one contractor to design, manufacture, and certify a flight-ready spacesuit.

For missions beyond Artemis III, the second mobile launcher (ML-2) is a critical part of the infrastructure needed to launch the upgraded SLS Block 1B and Block 2 rockets, which are designed to carry additional mass required to deliver the components of the Gateway space station. The ML-2 project is significantly behind schedule and over budget, jeopardizing launch schedules for Artemis IV and beyond. In August 2024, the OIG projected the ML-2 would not be ready to support a launch until spring 2029, not in time for the currently planned Artemis IV launch in late 2028.[1] Further, while the original contract value for ML-2 was under $500 million, as of July 2024, the contract value had grown to $1.4 billion, with additional increases expected.

Additionally, the SLS Block 1B rocket, which is currently under development, continues to experience cost increases, schedule delays, and quality management deficiencies. In August 2024, we projected SLS Block 1B costs will reach approximately $5.7 billion before the system is set to launch in 2028—$700 million more than the Agency's baseline commitment for the effort.[2] Further, the contractor's delivery of the Exploration Upper Stage to NASA was delayed from February 2021 to April 2027, which combined with other factors, suggests the 2028 Artemis IV launch date could be delayed as well.

Given the substantial cost, historical significance, and scientific relevance of the Artemis missions, it is crucial for NASA to identify and implement effective ways to reduce costs to enable fiscal sustainability for its flagship human exploration effort. The high costs and ambitious schedule require NASA to balance innovation with fiscal responsibility and mission safety. The Agency has taken several steps to improve its management of the Artemis missions. In response to a congressional mandate, NASA created the Moon to Mars Program Office within the Exploration Systems Development Mission Directorate, centralizing leadership for Artemis-related programs. In 2022, NASA conducted its first Moon to Mars Architecture Concept Review to define elements for an initial lunar surface architecture and align its exploration strategy with 63 Moon to Mars objectives. The SLS, Orion, and Exploration Ground Systems Programs are also implementing cost reduction targets to make the Artemis campaign financially sustainable. Although NASA has made progress with the Artemis campaign and returning humans to the Moon, the effort continues to be a top management challenge for the Agency.

---

[1] NASA OIG, *NASA's Management of the Mobile Launcher 2 Project* (IG-24-016, August 27, 2024).

[2] NASA OIG, *NASA's Management of Space Launch System Block 1B Development* (IG-24-015, August 8, 2024).

NASA astronaut and Expedition 72 flight engineer Anne McClain is pictured near one of the International Space Station's main solar arrays during a spacewalk on May 1, 2025.

Source: NASA.

# SUSTAINING A HUMAN PRESENCE IN LOW EARTH ORBIT

For nearly 25 years, humans have sustained a continuous presence in LEO—the region in space located about 200 to 270 miles above the Earth's surface—through living in and conducting research aboard the ISS. The United States, along with Canadian, European, and Japanese partners, operate the United States Orbital Segment of the ISS, while Russia exclusively operates its own segment. The LEO microgravity environment offered by the ISS is essential for crew training, fundamental and applied research, advanced systems development, and other activities that facilitate human deep space exploration for Artemis and potential future longer-duration missions to Mars. The ISS has historically absorbed approximately 29 percent (approximately $1.25 billion) of NASA's annual space operations budget. As we reported in September 2024, NASA expects to continue its level of expenditure until the Station's retirement in 2030, assuming that it can overcome increasing risks to a variety of long-standing operational challenges.[3]

To sustain Station operations through 2030, astronauts must perform ongoing maintenance. With multiple extensions to the Station's intended life, managing repairs and upgrades becomes increasingly difficult in part due to suppliers decreasing or ceasing production of parts not intended to be in production for this long. For example, the current ISS spacesuits used by the astronauts to perform spacewalks were designed more than 50 years ago and have led to increased safety risks. While NASA contracts with Collins Aerospace to maintain and operate these suits, Collins' performance has declined over the past several years and critical spacesuit components are not being replaced or maintained as needed—ultimately compromising the safety and effectiveness of ISS operations. In addition, over the last year, an air leak in a Russian Transfer Tunnel reached its highest leak rate to date, requiring continued structural risk mitigation efforts.

[3] NASA OIG, *NASA's Management of Risks to Sustaining ISS Operations through 2030* (IG-24-020, September 26, 2024).

Further exacerbating this challenge is the lack of redundancy and limited capabilities for transportation to bring supplies, science, and crew to and from the Station. NASA relies on its commercial cargo and crew partners for this transportation capability. However, these partners face limited launch capabilities, at times relying solely on SpaceX's Falcon 9 rocket. For cargo transportation, the Agency has two operational partners in Northrop Grumman and SpaceX, but only SpaceX is capable of returning cargo from the Station. For crew, NASA relies on the SpaceX Crew Dragon for U.S.-based crew transportation to and from the Station while the Boeing Starliner continues to work toward its human-rating certification. In June 2024, Boeing's first crewed flight test of its Starliner capsule to the ISS experienced multiple problems and faced risks of continued propulsion system failures on the return flight that ultimately led NASA to decide to bring the astronauts home on SpaceX's Dragon vehicle instead. As a result, in March 2025, two NASA astronauts returned to Earth on a Dragon after what was expected to be a 10-day mission on the Starliner became a nine-and-a-half-month stay aboard the ISS.

After the ISS is retired, the Agency plans to continue its presence in LEO by utilizing one or more commercially owned and operated space destinations. This transition will require significant financial investment from NASA and industry, and substantial demand for commercial services in LEO. Based on previously reported expected capabilities and estimated prices for commercial LEO destination services, transitioning from a government-owned to a privately-owned station is estimated to save NASA between $1.3 billion and $1.8 billion per year. For the transition to be successful, multiple cost-efficient LEO transportation options for cargo and crew are necessary for redundancy and safety, as well as to foster competitive pricing. The Agency aims to have at least one new station available by 2028, allowing for a 2-year overlap with the ISS before it is decommissioned in 2030. To this end, NASA contracted for commercial modules to be attached to the Station and awarded Space Act Agreements for the design of stand-alone commercial space stations. However, any delay to the next phase of NASA's commercial destination acquisition approach could hinder its ability to have the 2-year planned overlap with the ISS.

Ultimately, the ISS will need to be safely deorbited with most of the Station burning up during atmospheric reentry and the remaining debris targeted for a specific, unpopulated area in the ocean. The Agency's original deorbit plan, which relied solely on propulsion from three Russian Progress vehicles, was determined to be insufficient due to the vehicles' inability to offer enough control during deorbit. Instead, NASA and Roscosmos plan to use a yet-to-be-developed U.S. Deorbit Vehicle alongside two Russian vehicles to successfully complete the deorbit. Further, uncertainty of Russia's commitment to the deorbit plan, given that it is currently only committed to ISS operations through 2028, may require NASA to make additional adjustments to plan for the successful controlled deorbit of the Station within the next half-decade.

Artist's concept depicting NASA's Europa Clipper spacecraft in orbit around Jupiter. The mission launched on October 14, 2024, and is expected to arrive at Jupiter's moon Europa in 2030.

Source: NASA/JPL-Caltech.

# IMPROVING MANAGEMENT OF MAJOR PROGRAMS AND PROJECTS

In the past year, NASA has achieved several accomplishments across space exploration, Earth science, and technological innovation. From launching the Europa Clipper mission to investigating Jupiter's icy moon, to achieving a historic lunar landing through its Commercial Lunar Payload Services initiative, the Agency has expanded humanity's reach and understanding of the cosmos. NASA also unveiled the Low Boom Flight Demonstrator (X-59) quiet supersonic aircraft, advanced preparations for the Artemis II crewed mission around the Moon, and celebrated 24 continuous years of human presence aboard the ISS. These milestones underscore NASA's commitment to pushing the boundaries of discovery while delivering tangible benefits to life on Earth.

Each year, NASA invests billions of dollars in major programs and projects to extend human presence beyond LEO, understand and explore Earth and the solar system, and conduct aeronautics research. To fund its major programs and projects, NASA uses contracts and other agreements. In FY 2024, NASA planned to invest more than $80 billion over the life cycle of its major projects in support of the Agency's Artemis campaign, LEO missions to the ISS, and science and aeronautics research missions such as the James Webb Space Telescope and X-59 aircraft.

While each of these projects incorporate one-of-a-kind technological and scientific advances, they often cost more and take longer to develop than promised—the effects of which are felt across the Agency. We have consistently highlighted the challenge of improving the management of major programs and projects, emphasizing the need for enhanced acquisition and management practices to ensure cost stability, cost transparency, and a smooth transition to a more service-based commercial acquisition approach. Poor acquisition management can lead to significant delays in project completion, which ultimately results in greater costs to the taxpayer.

One of the primary factors of this challenge is NASA's inability to control costs of major programs. The SLS heavy-lift rocket and Orion spacecraft, key components of the Artemis campaign, have faced significant cost

overruns and schedule delays. For example, we noted in a May 2023 report that the SLS Program experienced a $6 billion increase in its development cost, reaching approximately $13.1 billion.[4] Similarly, the Orion Program's cost increased by more than 35 percent, with a total development cost of around $9.3 billion. NASA's Low Boom Flight Demonstrator, which had an original baseline cost commitment of $583 million when it first entered development, is now projected to cost over $900 million.

Cost transparency is another critical factor that we identified. We have stressed the importance of establishing clear cost and schedule baselines for major programs like SLS and Orion. Transparent reporting of costs and schedules helps stakeholders understand the true financial and time commitments required for these programs and projects. Our reports on the SLS have repeatedly highlighted that the program had revised its cost and schedule baselines multiple times, leading to confusion and mistrust among stakeholders. The SLS Program's initial cost estimate of $7 billion, which has since increased to over $11 billion, does not reflect or establish an Agency commitment for the full life-cycle cost of the program nor does it describe how many SLS vehicles are included in that dollar amount. Further, there are no comprehensive cost estimates that account for all components and aspects of each Artemis mission, to include iterations of the SLS and the future addition of the Gateway space station.

We have also highlighted NASA's transition to a more service-based commercial acquisition approach. This shift involves partnering with commercial entities to provide services rather than developing and owning all necessary infrastructure. This approach can lead to cost savings, increased efficiency, and innovation. For example, NASA's Commercial Lunar Payload Services initiative aims to leverage private sector contractors to deliver science and technology payloads to the Moon for significantly less cost than what NASA had paid for previous lunar missions. While this strategy aligns with NASA's goal of leveraging the capabilities of the private sector to achieve its mission objectives more cost-effectively, the Agency has acknowledged it has taken on greater risk—only one of the four Commercial Lunar Payload Services missions launched so far has been completely successful. Moving forward, NASA will need to be even more vigilant in its analysis of whether the reduced cost introduces increased risks as it plans to transition human space flight operations to commercial entities.

In a 2012 report on NASA's project management challenges, we wrote, "As the President and the Congress work to reduce Federal spending and lower the Nation's budget deficit, NASA's ability to deliver projects on time and within budget is more important than ever."[5] We also wrote that funding instability was one factor that can lead to inefficient management practices. As the Agency transitions to FY 2026, changing programmatic and funding priorities expressed by the President and Congress will necessitate that the Agency more efficiently manage its portfolio of projects. As we said in 2012, "…clear and consistent leadership by the President, Congress, and NASA management is an essential first step toward ensuring project managers are well positioned to complete projects within cost, schedule, and performance estimates."

Improving the management of major programs and projects is a top priority for NASA, as highlighted in the Agency's responses to our previous top management challenges reports. NASA recognizes the inherent challenges of managing large, complex, often first-of-their-kind space flight and aeronautics programs and has worked over many years to improve policies and processes that control cost and schedule while ensuring safety and mission success. By controlling costs, providing for greater transparency, and successfully managing risk in its transition to more service-based commercial acquisitions, NASA can better manage its resources and more efficiently achieve its ambitious mission goals. The execution of well-designed acquisition plans and cost estimates, monitoring of contractors' performance, and the skills and judgment exercised by acquisition personnel throughout the procurement life cycle are imperative.

---

[4] NASA OIG, *NASA's Management of the Space Launch System Booster and Engine Contracts* (IG-23-015, May 25, 2023).

[5] NASA OIG, *NASA's Challenges to Meeting Cost, Schedule, and Performance Goals* (IG-12-021, September 27, 2012).


Staff monitor an Artemis II mission simulation on August 19, 2025, from the new Orion Mission Evaluation Room inside the Mission Control Center at Johnson Space Center.

Source: NASA.

# MANAGING CYBERSECURITY RISKS AND EMERGING TECHNOLOGY

NASA inspires the world through exploration and discovery, leading scientific and technological advancements that benefit all humanity. Vast IT capabilities enable the Agency's discoveries, which allows for the sharing of mission data, improves NASA workforce productivity, and increases mission quality, resilience, and cost-effectiveness. As cyberattackers become more aggressive, organized, and sophisticated, managing and mitigating cybersecurity risk is critical to protecting NASA's extensive network of IT systems from malicious attacks or breaches that can seriously inhibit the Agency's ability to carry out its mission.

This year NASA has continued its efforts to better protect its systems by consolidating assessment and authorization activities—reviews designed to ensure an IT system meets cybersecurity requirements, reduce duplication of software and services, and standardize cybersecurity services for its institutional (corporate) and mission and center (non-corporate) IT systems. Even with these efforts, there are several key areas such as adoption of zero trust, implementation of cybersecurity risk management, and the increased use of new and emerging technologies that continue to impact NASA's cybersecurity and its ability to navigate digital threats and safeguard IT assets and sensitive data.

NASA's Office of the Chief Information Officer (OCIO) is responsible for approximately 51 percent of the Agency's corporate IT assets (desktop computers, laptop computers, and servers). The remaining 49 percent fall to the mission directorates and centers (non-corporate environment). While the Chief Information Officer has overarching responsibility for all aspects of the IT infrastructure, coordination with mission directorates and centers on IT matters ensures the Agency uses IT to improve government operations. However, when issues like IT management and cybersecurity cross organizational boundaries and where competing interests and independent budgets come into play, the likelihood of success is minimized.

NASA continues to adapt to the challenges presented by utilizing new and emerging technologies, such as artificial intelligence (AI), machine learning, and other tools, to further its mission while balancing the need for access and governance over the security of these technologies. NASA's interest in AI, especially generative AI (GenAI), has rapidly evolved over the last 2 years.[6] The Agency established a new Chief Artificial Intelligence Officer role to guide AI adoption and innovation while managing risks. In addition, NASA leadership is working to establish standards for safeguarding data privacy, ensuring compliance with relevant regulations, and aligning GenAI use with NASA's values as an agency. However, adoption of this technology comes with new risks that must be managed, such as exposing data to unauthorized access, inadvertent public release of sensitive NASA data, inaccuracy of GenAI output, and ethical and legal issues surrounding GenAI capabilities.

Additionally, with its unique mission and numerous public-facing websites, NASA is a particularly attractive target to cyber criminals. Given the increasingly sophisticated and persistent threat campaigns against NASA and the entire federal government's IT architecture, the Office of Management and Budget has directed a government-wide shift from reliance on a 'moat protecting the castle' approach—a single-security perimeter—toward a 'zero trust' approach to cybersecurity based on continual verification of each user, device, application, and transaction. There is no single tool NASA can deploy to instantly implement a zero trust architecture (ZTA) as different system architectures are necessary for unique environments. Zero trust applied to a commercial, general-purpose Agency-wide IT application, like email, is different than implementing zero trust for NASA-specific legacy systems in operation for decades.

In a March 2025 report, we found NASA had made progress implementing ZTA within its corporate environment by appointing a zero trust strategy implementation lead, submitting its implementation plan to the Office of Management and Budget, and completing ZTA security actions.[7] However, ZTA implementation for the non-corporate environment has not yet started. By delaying the non-corporate environment, NASA's ZTA strategy lacks an Agency-wide focus and is missing an opportunity to address enterprise-wide issues such as organizational boundaries, integration hurdles, and operational complexities that pose operational, technical, and financial challenges resulting from the non-homogeneous nature of the Agency's missions. A lack of effective engagement between the OCIO and mission directorates is hindering implementation, largely due to the OCIO and mission directorates operating within their organizational boundaries and not consistently collaborating or communicating.

NASA's Federal Information Security Modernization Act (FISMA) grade over the past 4 years continues to underscore our concerns—scoring IT maturity and overall health below the "managed and measurable" rating the Office of Management and Budget considers effective. NASA's information security program scored at a level 3 (Consistently Implemented), which means policies, procedures, and strategies were consistently implemented, but quantitative and qualitative effectiveness measures were lacking. FISMA requires NASA to develop, document, and implement agency-wide programs to provide security for the information and information systems that support their mission. In March 2025, the Government Accountability Office reported that NASA had not fully implemented its cybersecurity risk management program for some projects and associated systems.[8] Without a strong risk management program covering the selected systems, NASA faces increased risks that cyber incidents could result in loss of mission data or a decreased lifespan or capability of space systems.

Overall, NASA's decentralized approach to IT management with multiple lines of independent authority among its corporate and non-corporate environments continues to impede its progress in effective IT management and cybersecurity. As new and emerging technologies continue to develop and evolve, a continued reliance on this model will only contribute to potential cybersecurity concerns of the Agency and its data.

---

[6] GenAI learns the patterns and relationships in a dataset of human-created content. It then uses the learned patterns to generate new content, such as text, images, music, and videos.

[7] NASA OIG, *Audit of NASA's Zero Trust Architecture* (IG-25-004, March 27, 2025).

[8] Government Accountability Office, *Cybersecurity: NASA Needs to Fully Implement Risk Management* (GAO-25-108138, June 25, 2025).

Near Space Network antennas at NASA's White Sands Complex in Las Cruces, New Mexico.

Source: NASA.

# SUSTAINING MISSION CRITICAL CAPABILITIES

NASA's mission critical capabilities are important to enable mission readiness and continue the Agency's leadership in science, exploration, discovery, and innovation. To accomplish its diverse scientific and space exploration missions, NASA relies on a highly skilled workforce, as well as specialized facilities and infrastructure. NASA's ability to sustain mission critical capabilities includes managing technical workforce needs, addressing aging infrastructure and facilities, and transitioning communication capabilities to commercial industry. Addressing these core issues will be crucial for maintaining operational effectiveness and ensuring the success of the Agency's ambitious missions.

NASA's highly skilled and unique workforce—personnel at the Agency's Headquarters, centers, and other NASA-operated facilities across the country and around the world—continue to be crucial for advancing missions in space and on Earth. Historically, we have reported on challenges the Agency faces with its technical workforce including ensuring sufficient personnel with the right skills in technical occupations are available to support missions; attracting and retaining science, technology, engineering, and mathematics employees; and addressing a retirement wave for the technical workforce. While these challenges continue this year, they are exacerbated by workforce reductions occurring across the Agency. As of July 2025, NASA's workforce decreased by approximately 20 percent since 2023, from over 18,000 to roughly 14,000 employees. The reductions present difficulties to maintaining institutional knowledge and ensuring the continuity of mission critical operations. NASA will also continue to be challenged to attract and retain top talent as the Agency increasingly competes with the private sector for skilled professionals.

NASA's ambitious multi-year exploration, science, and aeronautics missions require the Agency to focus on its workforce needs and staff appropriately. However, the OIG, Government Accountability Office, and National Academies of Sciences, Engineering, and Medicine (National Academies) have all reported on the Agency's lack of a workforce planning process and that engagement activities could better target NASA's critical workforce needs.[9] To its credit, the Agency continues

[9] The National Academies are private, nonprofit institutions that provide expert advice to help shape sound policies, inform public opinion, and advance the areas of science, engineering, and medicine.

to modernize its human capital processes and talent acquisition systems and has reduced the time it takes to hire technical staff. Additionally, the Agency maintains a robust intern program—one of its most beneficial recruiting tools.

NASA's infrastructure, much of which dates back to the 1960s, is aging and increasingly costly to maintain. This has serious implications for the Agency as it may lack state of the art facilities that are critical to advancements in exploration, science, and technology. Further, these older facilities sometimes struggle to provide routine functions such as electric power, water, heat, gas, and waste disposal. The National Academies noted in a 2024 report that NASA tends to prioritize funding new missions over maintaining and building new infrastructure, which has created infrastructure that would not be acceptable under most industrial standards.[10] All of this together puts the Agency's critical infrastructure at risk.

As of August 2025, approximately 83 percent of NASA's facilities have surpassed their designed lifespan. The Agency also faces a more than $4.1 billion deferred maintenance backlog that continues to grow due to inflation and declining maintenance budgets. Our prior work has shown this aging infrastructure poses significant challenges, including increased maintenance costs and the risk of critical system failures. This backlog of necessary repairs and upgrades has also hindered NASA's ability to carry out its missions effectively. The Agency must be focused not only on maintaining and upgrading facilities but also protecting them. This year we reported on concerns with how NASA was protecting critical infrastructure from weather-related events and how the increase of these events can significantly impact missions.[11]

To address the challenges with aging infrastructure and facilities, NASA has implemented an Agency-wide Master Plan that guides Agency investments to prioritize mission critical assets and divestment of assets not needed for the Agency's missions. The Agency has also moved to a tiered maintenance approach for critical assets, which attempts to ensure that the right type of maintenance is performed on the most critical assets, at the right time, and for the right reasons. Importantly, in July 2025, Congress provided $1 billion to the Agency to use for necessary upgrades at some of its centers.[12]

NASA is transitioning many of its key space communication capabilities to the commercial industry to leverage private sector innovation and reduce costs. One notable example is the Space Communications and Navigation program, which aims to integrate commercial satellite communication services into NASA's operations. This transition allows NASA to focus on its core missions while benefiting from the efficiencies and advancements of commercial providers. NASA's reliance on commercial services for mission communications has increased, with approximately 36 percent of mission direct-to-ground service minutes now provided by commercial ground network providers.

Additionally, NASA is planning to purchase communication services for the Mars relay network—an international constellation of five spacecraft orbiting Mars that sends data from surface rovers back to Earth—from commercial industry. NASA's intent is to use a mix of NASA-owned infrastructure and commercially-operated systems to gradually replace the orbiters in space that currently serve as the backbone for communication. Multiple companies are expected to be involved in this emerging market. As of August 2025, Blue Origin had plans to build a Mars Telecommunications Orbiter to support the Agency's needs by 2028. These transitions will likely involve multiple technical challenges, and NASA must ensure the reliability and security of commercial services and effectively manage the integration of these services into the Agency's existing infrastructure.

Managing its technical workforce, addressing aging infrastructure and facilities, and transitioning key communication capabilities to commercial industry is essential for maintaining NASA's operational effectiveness. Historically, NASA's budget has often been incompatible with the scope, complexity, and difficulty of its mission work, resulting in the erosion of its workforce and infrastructure capabilities. The Agency will continue to be challenged due to the imbalance in allocations of funding, with a greater focus on missions rather than institutional support. If enacted as proposed, the FY 2026 budget will necessitate careful prioritization and strategic planning to ensure that NASA can continue to meet its mission objectives.

---

[10] National Academies, *NASA at a Crossroads: Maintaining Workforce, Infrastructure, and Technology Preeminence in the Coming Decades* (2024).

[11] NASA OIG, *NASA's Approach to Infrastructure and Operational Resilience* (IG-25-008, August 4, 2025).

[12] One Big Beautiful Bill Act (H.R.1), Pub. L. No. 119-21 (2025).

# APPENDIX A: ACRONYMS

| | |
|---|---|
| AI | artificial intelligence |
| FISMA | Federal Information Security Modernization Act |
| FY | fiscal year |
| GenAI | generative AI |
| ISS | International Space Station |
| IT | information technology |
| LEO | low Earth orbit |
| ML-2 | Mobile Launcher 2 |
| OCIO | Office of the Chief Information Officer |
| OIG | Office of Inspector General |
| SLS | Space Launch System |
| ZTA | zero trust architecture |

# APPENDIX B: MANAGEMENT'S COMMENTS

National Aeronautics and Space Administration

**Office of the Administrator**
Mary W. Jackson NASA Headquarters
Washington, DC 20546-0001

January 2, 2026

TO: Senior Official Performing the Duties of the Inspector General

FROM: Administrator

SUBJECT: Agency Response to Office of Inspector General Report "2025 Report on NASA's Top Management and Performance Challenges"

The National Aeronautics and Space Administration (NASA) appreciates the opportunity to review and comment on the Office of Inspector General (OIG) draft report entitled 2025 Report on NASA's Top Management and Performance Challenges (Q-25-03-00-AOQA), dated September 18, 2025.

The Agency values the OIG's perspective on risks and vulnerabilities related to programs and operations, as well as its recognition of NASA's successes. The OIG's audits and investigations augment collective efforts to provide oversight and gain insight into NASA's broad portfolio of programs, projects, and mission support activities. These efforts further the cause of providing the taxpayer with maximum value for each dollar invested in NASA's ambitious and challenging portfolio. NASA continues to aggressively pursue the mitigation and remediation of findings related to audit recommendations, including those that underpin the observations in this report.

While striving for optimal outcomes, NASA acknowledges that it can always improve. The audacity of the missions undertaken carries significant risk. The Agency's ability to overcome these challenges depends on maximizing successes and learning from failures. NASA strengthens accountability both internally and through procurement activities with external partners and vendors.

NASA agrees with the five broad areas outlined in the 2025 report and highlights mitigation and remediation efforts relative to each challenge that are underway or have been completed. These efforts demonstrate NASA's commitment to addressing its most significant management and performance challenges.

**Challenge 1: Returning Humans to the Moon**

The Artemis missions reflect the excitement, innovation, and collaborative spirit driving NASA's goals for space exploration. NASA does not, and will not, take this public trust for granted. The Agency's commitment to safety is unparalleled due to the extreme risks involved in space exploration and the comprehensive systems in place to mitigate those risks. NASA designs systems with multiple layers of redundancy, embeds continuous safety reviews into every stage of mission development, and prioritizes astronaut survival above all else. The Exploration Systems Development Mission Directorate (ESDMD) continuously

learns from past missions and incorporates lessons learned into future missions to enhance safety and performance.

Testing heat shield performance was a primary objective of the Artemis I mission. Post-flight analysis revealed unexpected char loss across the Orion heat shield. Engineers conducted eight separate post-flight thermal test campaigns, completing 121 individual tests to support the root cause determination. NASA's technical authorities and senior leadership concluded that acceptable flight rationale can be developed to safely fly the Artemis II crew using the existing heat shield, with targeted operational changes to the entry profile.

NASA has a history of discovering unexpected performance during rigorous testing and proceeding safely through analysis and mitigation rather than immediate hardware replacement. For example: early Apollo heat shield tests revealed ablation patterns that differed from predictions; pre-flight Space Shuttle engine tests detected minor vibrations or thrust variations; and Orion parachute drop tests occasionally showed unexpected canopy inflation behavior. In each case, engineers refined procedures, adjusted designs, or updated operational parameters, enabling safe missions while improving future systems. The Artemis I heat shield assessment reflects this same risk-informed approach: test to learn, analyze, mitigate risk, and incorporate lessons into subsequent flights.

NASA is producing future Orion heat shields for Artemis lunar landing missions with improvements to achieve greater material uniformity and consistent permeability. These advancements strengthen long-term system robustness while ensuring near-term missions proceed safely.

NASA publicly shared its heat shield decision on December 5, 2024, following unanimous agreement among senior leadership and subject matter experts. As administrator, one of my earliest priorities has been to fully understand the technical basis for this decision and ensure it reflects the Agency's commitment to safety, transparency, and data-driven judgment. NASA will continue to make additional information available to the public as analyses are completed and decisions are refined.

These efforts occur amid significant aerospace supply chain disruptions, which have compounded technical and schedule challenges across the industry. NASA is managing these pressures through proactive coordination, risk-informed decision-making, and clear communication of the interconnected factors affecting cost, schedule, and performance.

NASA employs a range of tools to monitor quality, progress, and performance relative to cost and schedule objectives. These approaches include government mandatory inspection points, project-level cost and schedule joint confidence level commitments (including for major developmental upgrades), independent reviews at major life-cycle reviews and key decision points, documented and configuration-controlled mission definition baselines, risk assessments, independent financial auditing, and Agency-led baseline performance and major program reviews. Independent reviews are also conducted by entities such as the Aerospace Safety Advisory Panel. This rigorous monitoring helps NASA maintain accountability and quality in its programs and projects.

ESDMD recognizes the OIG's critical role in promoting Artemis accountability and transparency. The Artemis II mission represents a significant milestone in NASA's Artemis missions and human space exploration efforts, bringing the Agency closer to returning humans to the Moon and eventually sending astronauts to Mars. NASA remains committed to ensuring safe missions, reflecting its dedication to astronaut safety, mission success, and advancement of human space exploration.

**Challenge 2: Sustaining a Human Presence in Low Earth Orbit**

NASA agrees that a sustained human presence in low Earth orbit (LEO) will be critical to supporting research and exploration missions after the end of the International Space Station (ISS) Program. NASA tracks maintenance tasks and sparing[1] on the ISS and is positioned to continue safe operations through end-of-life, including safe deorbit. The ISS Program continues to work closely with international partners to ensure the viability of all modules and systems through end-of-life.

NASA is working with industry and commercial partners to refine the transition from ISS operations to Commercial LEO Destinations. In 2025, the One Big Beautiful Bill Act provided $325 million for the U.S. Deorbit Vehicle, which passed its Preliminary Design Review in September 2025. Maintaining a robust U.S. transportation capability will be a key component as NASA moves beyond ISS operations.

NASA will continue to work with contributors across the Agency and commercial partners to maximize and optimize the life and value derived from the International Space Station, while preparing for a future in which the Agency develops on one or more stations in partnership with the commercial industry.

**Challenge 3: Improving Management of Major Programs and Projects**

NASA has addressed challenges impacting acquisition and performance management of major programs and projects by optimizing available resources while advancing ingenuity and innovation. Over several years, the Agency has improved policies and processes to control cost and schedule while ensuring safety and mission success, most recently minimizing growth in cumulative cost overruns and decreasing cumulative development schedule delays of major programs and projects.

Identifying and addressing contract overruns is a priority for NASA, reflecting the Agency's commitment to fiscal responsibility and stewardship of taxpayer resources. NASA has invested significant effort to advance programmatic controls, analytical capabilities, contract management, acquisition strategies, reporting transparency, and cost and schedule performance through Corrective Action Plans implemented in response to the Government Accountability Office's High Risk List designation. These actions demonstrate NASA's understanding that bold ambitions must balance scope and complexity with effective cost and schedule management. However, much work remains.

NASA prioritizes both short-term cost containment and long-term mission objectives to enable meaningful exploration and discovery. The OIG report recommends including all

costs for each Artemis mission in flight-specific estimates; however, this approach does not reflect the Agency's integrated program design or cost accounting practices, which capture individual element costs during Phase E, Operations and Sustainment. Applying a flight-by-flight benchmark would misrepresent the program's structure and management decisions previously communicated by the Agency.

Artemis implementation is guided by a flexible architecture, enabling NASA to adapt to changing requirements, leverage partnerships, and achieve sustainable, cost-effective human exploration of the Moon and beyond. The Agency has established Agency Baseline Commitments (ABC) for each project element of the Artemis missions, under the leadership of the Moon to Mars Program Office and has set ABCs for projects over $250 million across Mission Directorates. NASA regularly updates the Office of Management and Budget and Congress on the performance and progress of development projects and elements that have moved into production and operations.

Managing NASA's portfolio amid budgetary uncertainty and complex program requirements presents ongoing challenges. The Agency addresses these by leveraging commercial partnerships, strengthening acquisition processes, and applying robust cost, risk, and schedule management tools. NASA maintains rigorous financial controls and transparent reporting to ensure responsible stewardship of taxpayer resources while continuing to advance exploration objectives and sustain American leadership in space.

**Challenge 4: Managing Cybersecurity Risks and Emerging Technology**

NASA acknowledges the challenges in this area and is taking mitigating actions described below.

*Artificial Intelligence*
NASA has made significant advancements in adopting generative Artificial Intelligence (AI) capabilities, establishing management controls and safeguards to responsibly implement AI and protect NASA data. NASA participates in incentive programs offered by IT cloud providers and AI companies to gain first-hand experience using AI to support mission requirements. Microsoft CoPilot Lite is available to the workforce, and NASA developed an internal chat tool, ChatGSFC. Copilot Premium is also available to all NASA civil servant and contractor staff on a trial basis through April 30, 2026, under the General Services Administration's OneGov licensing agreement. These tools allow staff to gain proficiency and find efficiencies in daily work.

NASA published the 2025 NASA Data Strategy and will publish its first AI Strategy in January 2026. Both strategies establish vision, goals, and objectives, and unify working groups across the Agency to manage AI procurement, data maturity assessment, policy, and governance. NASA has issued generative AI guidance encouraging responsible AI use and published a list of approved AI tools.

*Zero Trust Architecture*
In a Zero Trust architecture, access to resources is based on the principle of least privilege. NASA's move to Zero Trust is a necessity for strengthening cybersecurity against motivated adversaries. NASA's Office of the Chief Information Officer (OCIO), through its Cybersecurity Improvements Portfolio (CIP), leads focused efforts to mature Zero Trust implementation Agency-wide. The CIP manages scope, cost, schedule, performance, and risk for projects and initiatives and tracks nearly 300 Zero Trust requirements and a dozen federal mandates.

Workshops with Mission organizations help identify gaps and establish a whole-of-Agency approach. This collaboration strengthens the relationship between OCIO and Mission Directorates to support persistent information sharing and implementation of Zero Trust across the Agency.

*Federal Information Security Modernization Act*
NASA continues to evaluate qualitative and quantitative effectiveness measures to address enterprise-wide cybersecurity challenges. Effective engagement and collaboration between OCIO and Mission Directorates, facilitated by the Enterprise Risk Integration Strategy Officer, ensures communication and documentation of risk. NASA continues to pursue top-down integration solutions for cybersecurity risk communication and program implementation, which will reflect in Agency projects and system-level assessments.

**Challenge 5: Sustaining Mission Critical Capabilities**

*Workforce*
NASA's mission-critical capabilities sustain the Agency's global leadership in science, exploration, and innovation. NASA refines its workforce planning process to align institutional operations with priority mission needs. Centers and Mission Support Enterprise Organizations work closely with Mission Directorates, the Office of the Chief Financial Officer, and program offices to plan workforce levels based on estimated workload and budget.

In response to workforce reductions, NASA implements targeted talent development strategies focusing on supervisory development and technical training to maintain frontline leadership capability and specialized expertise.

Opportunities to recognize, reward, and inspire the workforce can maximize NASA's talent and reinforce high performance. NASA's enterprise recruitment strategy integrates digital platforms, virtual outreach, and in-person engagement. Government-wide programs such as Pathways build a sustainable pipeline of early-career professionals, while special hiring authorities and workforce flexibilities enable the Agency to remain competitive. Grassroots recruitment at the Center level ensures alignment with local talent pools and mission-specific needs.

Empowering individual contributors to take decisive action enables the Agency to move with greater agility and maintain leadership in space exploration.

*Infrastructure*

NASA takes a disciplined, data-driven approach to modernize and right-size infrastructure to support current and future mission needs. Guided by Administration priorities, the Agency focuses investments on facilities with the highest demand and mission relevance, particularly those required for Moon to Mars and other human spaceflight objectives, while rapidly divesting assets with little or no mission demand. This approach ensures resources are directed where they deliver the greatest mission value.

The Agency implements the Agency Master Plan (AMP) and Asset Inventory Assessment to categorize facilities based on mission relevance. This enables prioritization of mission-critical assets, identification of opportunities to monetize or out-grant infrastructure, and accelerated divestment of unneeded facilities, reducing operating costs and addressing the deferred maintenance backlog.

Limited operations and maintenance resources are concentrated on critical assets through Reliability-Centered Maintenance and standardized stewardship practices, ensuring resilient, reliable infrastructure capable of sustaining uninterrupted operations.

Enterprise acquisition strategies reduce procurement timelines, increase competition, and deliver cost savings for reinvestment into priority infrastructure needs. Funding provided under the One Big Beautiful Bill (OBBB) Act provides a critical down payment toward modernizing infrastructure at human spaceflight centers.

These efforts reflect a "One NASA" approach to allocating resources, including OBBB investments, toward infrastructure that is required, utilized, and aligned with mission objectives while divesting assets no longer needed. This strategy reduces risk, contains long-term costs, and ensures NASA's infrastructure is positioned to support exploration missions.

Space Communications

The Space Communications and Navigation (SCaN) program is executing National policy guidance to transition services to the commercial sector where practicable, leveraging private-sector innovation while maintaining essential government-unique capabilities. Nearly half of mission direct-to-ground service minutes are delivered by commercial providers, with opportunities to scale for routine services. SCaN prioritizes mission continuity and infrastructure that makes commercial adoption safe and repeatable.

Aging network infrastructure presents challenges. SCaN addresses space relay needs for the Near Space Network and upgraded Deep Space Network (DSN) scheduling tools in fiscal year 2025. Oracle Private Cloud Appliances were upgraded to a more robust, cloud-enabled system, reducing processing time and enabling multi-scenario schedule planning. Engagement with industry uplifts the orbital economy while allowing NASA to focus on developing future technologies.

**Conclusion**

NASA has reviewed the report for information that should not be publicly released and identified none. The Agency acknowledges its shortcomings and remains committed to continuous improvement. Space exploration inherently involves uncertain outcomes, and NASA is committed to accomplishing the near impossible while continuously improving safety and robustness.

Thank you for the opportunity to review and comment on the draft 2025 Top Management and Performance Challenges report and provide updates on progress. Questions regarding NASA's response may be directed to Mark Jenson, GAO/OIG Audit Liaison Program Manager, at (202) 358-0629.

Jared Isaacman
NASA Administrator

cc:
Chief Financial Officer/Mr. Schmidt (Acting)
Chief Information Officer/Mr. Gallagher (Acting)
Associate Administrator for Exploration Systems Development Mission Directorate/
Dr. Glaze (Acting)
Associate Administrator for Space Operations Mission Directorate/Mr. Bowersox
Assistant Administrator for Strategic Infrastructure/Ms. Thaller (Acting)
Chief Human Capital Officer/Ms. Elliott

2025 Report on NASA's

# TOP MANAGEMENT and PERFORMANCE CHALLENGES

The Sun's glint beams off a partly cloudy Atlantic Ocean just after sunrise as the International Space Station orbited 263 miles above on March 5, 2025.

Source: NASA.