



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

March 19, 2023

The Honorable Rosa DeLauro
Ranking Member
Committee on Appropriations
U.S. House of Representatives
Washington, DC 20515

Dear Rosa:

In your recent letter to me, you asked that I provide you with an analysis of the impacts of potential cuts to the National Aeronautics and Space Administration (NASA) if House Republican Leadership were to cap Fiscal Year (FY) 2024 discretionary spending at the FY 2022 enacted level.

Investment in NASA's missions is an investment in American workers, American innovation, and American competitiveness. NASA is positioning our partners in commercial space and the national economy to compete – and win – the future of spaceflight and science in 21st century as we prepare to go to the Moon and then on to Mars. On March 9, 2023, the President submitted his proposed FY 2024 budget request to Congress, which reflects his program for NASA in human exploration, science, aeronautics, and space technology, consistent with ongoing, bipartisan direction from Congress.

At the same time, House Republicans have proposed reducing FY 2024 discretionary spending to the FY 2022 enacted level, potentially exempting defense discretionary spending and Veterans Medical Care. This would result in a reduction to non-defense discretionary spending—including NASA—of up to 22 percent from the FY 2023 level. NASA's FY 2023 appropriation is \$25.4 billion, reflecting continuing strong bipartisan support for NASA programs. NASA's research and development budget reflects multi-year investment in more than 250 ongoing programs and projects, with planned development curves that would be severely disrupted by imposed level funding or downward funding adjustments.

NASA has an impact beyond the vacuum of space. The Agency's bold missions represent American leadership and technological ingenuity, good-paying jobs at businesses across the country, and inspiration for the Artemis generation of workers that will help the United States (U.S.) lead into the future. NASA's budget currently supports approximately 17,500 full time employees and 30,000 on, or near-site support contractors, for a direct NASA employment total of 47,500, and another estimated 50,000 jobs through NASA prime contractors across the Nation. These jobs positively impact the overall U.S. economy, as well as local communities across the country.

A FY 2024 budget level for NASA at 22 percent below the FY 2023 enacted level would be \$19.8 billion, approximately the same level of NASA's FY 2019 appropriation, and a reduction of \$5.6 billion from the FY 2023 level. To fund NASA at such a level in FY 2024 would have devastating and potentially unrecoverable impacts, upon the objectives that the President and Congress have set for NASA, and weaken our Nation's position as a global leader in exploration, science, technology innovation, and discovery. A 22 percent funding reduction would:

- Result in a reduction of at least 4,000 NASA Center and on-site contractor personnel;
- Halt NASA's Artemis Program, by threatening the Artemis IV flight and effectively eliminating the Artemis V flight and missions thereafter, ceding U.S. leadership in exploration to other nations. Further, it would potentially delay the U.S. landing of the first woman and person of color on the Moon, subsequent U.S.-led lunar landings with a critical international coalition for a sustained lunar presence, and longer-term exploration in preparation for human missions to Mars;
- Delay missions that collect and disseminate Earth observing data to scientists, policy makers, affected communities, and a growing U.S. industrial base addressing the impacts of climate change and mitigating natural hazards; for example, disaster-response organizations use data from multiple NASA Earth-observing satellites to identify damaged areas following disasters such as hurricanes, floods, and wildfires;
- Freeze NASA's scientific exploration and discovery of the Sun and Solar System, and beyond, that engages more than 10,000 U.S. scientists. This also suspends a groundbreaking U.S.-led mission to return samples from the Martian surface to Earth;
- Cede U.S. leadership in aeronautics, by cutting NASA investments in cutting-edge aviation technologies that will increase the speed, efficiency, and safety of air travel, and significantly reduce emissions;
- Curtail NASA technology development with commercial partners intended to increase U.S. space capabilities, stimulate the U.S. economy, and create jobs; and
- Reduce NASA awards to Space Grant and other space STEM-related programs that educate our Nation's next generation of scientists, engineers, and explorers, decreasing participation by an estimated one million students and educators.

Enclosed are: (1) a summary of NASA impacts resulting from a FY 2024 budget at a level 22 percent below the FY 2023 NASA enacted level of \$25.4 billion (-\$5.6 billion), and (2) a summary of NASA impacts resulting from a FY 2024 budget frozen at the same level of the FY 2022 NASA enacted level of \$24.0 billion (-\$1.342 billion).

NASA's missions transcend partisan politics. Every NASA achievement is a triumph for our country and all of humanity. My sincere hope is that this Congress will recognize the importance of investing in our Nation's future – the future of science, innovation, and discovery – and fund the Agency at the President's full FY 2024 budget request.

I would be pleased to discuss this matter with you in greater detail at your convenience.

Sincerely,

Bill Nelson

2 Enclosures

**Impacts to NASA Programs of a FY 2024 Budget Level
22 Percent below FY 2023 NASA Enacted Level**

A FY 2024 NASA budget equal to 22 percent below the FY 2023 NASA enacted level of \$25.4B would be \$19.8B, or a reduction of \$5.6B from the FY 2023 enacted level. Information below outlines, by NASA Mission Directorate, how such a \$5.6B reduction would impact Agency missions.

NASA Science: Reduction of \$1.7B from FY 2023 enacted level, for a FY 2024 level of \$6.1B

A reduction of this magnitude would threaten NASA's ability to continue making critical advancements in all Science disciplines, and threaten NASA's international leadership in areas of National priority:

- Planetary Science: Significant impacts to Planetary missions and research:
 - Delay or cancel the Mars Sample Return (MSR) mission, a partnership with the European Space Agency to bring the first samples of Mars material back to Earth for detailed study, including samples already collected/cached by Mars Perseverance Rover. Delay/ cancellation would threaten U.S leadership of this groundbreaking mission, undermine U.S. competition with China, and increase mission risk with further aging of the Perseverance rover.
 - Delay or cancel DAVINCI, a mission to study the origin, evolution, and present state of Venus in unprecedented detail from near the top of the clouds to the planet's surface.
 - Delay or cancel Dragonfly, a mission to deliver a rotorcraft to Saturn's moon Titan to advance our search for the building blocks of life.
- Earth Science: Significant impacts to Earth Science missions, research and technology, including the Earth System Observatory (ESO).
 - Cancel up to three ESO missions and delay one ESO mission by 1-2 years. ESO will provide key information to guide efforts related to climate change, natural hazard mitigation, fighting forest fires, and improving agricultural processes. Cancellations/delays would threaten international contributions and delay advances in Decadal Survey-recommended science, potentially ceding U.S. leadership in climate research.
 - Significantly delay Landsat Next mission, which provides continuity of the longest space-based record of Earth's land surface and new capabilities for the next generation of Landsat users.
 - Delay new competitive opportunities in Earth Explorer/Venture Class programs for small/ medium-sized instruments/missions to address key Earth science and applications needs
 - Reduce commercial data buys, technology and research investments, and potentially cancel previously awarded grants.
- Astrophysics: Significant impacts include:

- Significant delay to the Roman Space Telescope, planned for 2027 launch, designed to unravel secrets of dark energy/dark matter, and search for/image exoplanets.
- Terminate U.S. contributions to future ESA Lisa and Athena missions, which will investigate some of the most extreme phenomena in the Universe
- Delay all future Astrophysics competitive mission opportunities, including the first Decadal Survey recommended Probe-class mission and Explorers missions
- Significantly reduce technology/research in all programs; could involve cancellation of previously awarded grants.
- Heliophysics: Significant impacts to Heliophysics missions and research:
 - Delay Interstellar Mapping and Acceleration Probe (IMAP), for launch in 2025, to understand boundary of heliosphere, a magnetic bubble surrounding/protecting Earth's solar system.
 - Delay or cancellation of Multi-slit Solar Explorer (MUSE) mission to understand forces driving heating/eruptions of Sun's corona at the foundation of space weather.
 - Significantly reduce technology/research in all programs; potentially cancel previously awarded grants.
- Biological and Physical Sciences:
 - Cancel the Commercially Enabled Rapid Space Science (CERISS) initiative to dramatically expand commercially developed in situ sample prep/analysis capabilities, limiting the transformational science that could be achieved for Low-Earth Orbit research in the post ISS era.

<p>NASA Aeronautics: Reduction of \$206M from FY 2023 enacted level, for a FY 2024 level of \$729M</p>

- Significant delays/rescopes to critical elements of NASA Sustainable Flight National Partnership, to support aviation community goal of net-zero carbon emissions by 2050 and increased aircraft efficiency, enabling reduced cost for traveling public and continued U.S. competitiveness.
 - Cancel one of two Electrified Powertrain Flight Demonstration project flight demonstrators;
 - Delay/rescope Sustainable Flight Demonstrator project, possibly to ground test only;
 - Cancel the Hi-Rate Composite Aircraft Manufacturing project demonstrations;
 - Delay/rescope the Hybrid Thermally Efficient Core project demonstration.
- Cancel the Advanced Concepts for Emergency Response Operations project, including the development of an interagency concept of operations for wildfire management.
- Reduce number of University Leadership Initiative awards supporting zero emissions aviation and advanced materials, reducing number of schools/students involved in ULI, impacting the pipeline of aviation science and engineering leaders needed to support U.S. aviation industry.
- Cancel/delay sustainable aviation operations activities such as demonstrations with partner airlines
- Reduce the Hypersonic Technology project and defer industry partnerships and collaboration.
- Reduce the Revolutionary Vertical Lift project.
- Reduce facility maintenance/support in Aerosciences Evaluation and Test Capabilities Portfolio.
- Significantly reduce workforce.

NASA Space Technology: Reduction of \$265M from FY 2023 enacted level, for a FY 2024 level of \$6.1B

- Delay On-Orbit Servicing, Assembly, and Manufacturing 1 (OSAM-1) and cancel On-Orbit Servicing, Assembly and Manufacturing 2 (OSAM-2) projects, impacting NASA's ability to advance national capability for assembly/deployment of complex structures in space and resulting in increased cost.
- Delay or cancellation of Nuclear Thermal Propulsion (NTP) project, resulting in NASA's inability to meet the partnership agreement with DARPA/DRACO.
- Cancel ongoing Cryogenic Fluid Management (CFM) Tipping Point projects with commercial partners that have near-term deliverables and are supporting Artemis mission needs.
- Cancel 2023 Announcement of Collaboration Opportunities and Tipping Point solicitation, preventing development of core technologies for national/commercial needs, including Artemis.
- Cancel Fission Surface Power (FSP) project, disrupting NASA's partnership with DOD and DOE to deliver clean energy for multiple government applications including Artemis missions.
- Cancel new Space Technology Research Institutes (STRI) and Lunar Surface Technology Research Opportunities (LuSTR) projects, impacting university participation in a diverse and powerful U.S. aerospace technology community through conducting technology research and development.

NASA Exploration: Reduction of \$1.6B from FY 2023 enacted level, for a FY 2024 level of \$5.8B

In the recent Artemis I mission, NASA accomplished successful flight demonstration of a crew capable vehicle traveling to the moon and returning safely to earth. Significant effort is underway to build on that success with the Artemis II, Artemis III, and Artemis IV missions, all planned to occur within the next few years. Artemis II will accomplish the first crewed mission to the moon since Apollo 17, 51 years ago, and demonstrate deep-space crew launch/return capability of the SLS/Orion system. Artemis III will return American Astronauts to the surface of the Moon. During the Artemis Campaign, NASA will land the first woman and first person of color on the Moon and restart lunar sample return toward Decadal Science objectives. Artemis IV will initiate the sustained lunar operation model with Gateway's delivery to lunar orbit, initial Gateway expansion with HAB through the international partnership with ESA delivered by SLS Block 1B and crewed Orion, and demonstration of sustained HLS docking with Gateway for crew exchange and continued exploration of the lunar surface.

Actions for Artemis II, Artemis III, and Artemis IV missions are planned in FY 2024 and beyond:

- SLS rocket, Orion crew capsule, and ground systems - Production of flight units for Artemis II-IV; initial crew capability on Artemis II; development and implementation of Orion docking system, and SLS Block 1B upgrades;
- Human lunar lander system (HLS) Initial Capability Option A with SpaceX for Artemis III;
- xEVAS Lunar Surface Suit Development with Axiom for Artemis III+;

- Gateway Initial Capability Development for PPE/HALO with Maxar/NG for Artemis IV+;
- HLS Option B – Sustained Lander Development with SpaceX for Artemis IV+.

Actions for efforts beyond Artemis IV are planned in FY 2024 and beyond:

- HLS App P – New industry Lander development for Artemis V to maintain competition (award planned for Summer 2022);
- Lunar Terrain Vehicle – Development of an unpressurized rover for Artemis V and beyond;
- SPEC (SLS Stages Contract that builds Artemis III, IV Core stages and procure Materials for stages for Artemis V, VI) - Definitized December;
- OPOC (Orion Production for Artemis VI-VIII) (ATP in September 2022).

Actions for Artemis V and beyond are planned in FY 2024 and beyond:

- EPOC RFP release (SLS Stages Contract the supports Artemis V+);
- Pressurized rover; including international partner agreements and HLS Cargo Landing;
- Lunar surface habitation and Science Systems.

Specific Exploration Impacts from a FY 2024 funding level of \$5.8B (-\$1.6B below FY 2023 enacted):

- Prioritize continuation of work for the content that supports Artemis II, and Artemis III with potential delays to those flights.
- Significantly restructure or terminate currently ongoing major development work for Artemis IV, including efforts such as Gateway, development of SLS Block 1B including Exploration Upper Stage, EGS's Mobile Launcher-2, and HLS Option B contract.
 - Significant layoffs throughout the ESDMD contract structure.
 - Threaten ability to achieve Artemis IV goals and overall ability for NASA to deliver heavy lift capability (Gateway as co-manifested payloads).
 - Threaten ability to fly Artemis IV and defer lunar exploration beyond Artemis IV.
- Terminate or not award new contracts for the system production/development (including already-developed/designed systems) that support work on Artemis V and beyond.
 - These actions would include not issuing planned award for HLS Appendix P for a new competitive entrant, the LTV that would support mobile Lunar exploration, and some portion of the SLS and Orion production contracts for Artemis V and beyond.
 - Layoffs would occur on some contracts.
- Halt any potential Mars development efforts.

<p>NASA Space Operations: Reduction of \$935M from FY 2023 enacted level, for a FY 2024 level of \$6.1B</p>
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- Substantially increased risk to U.S. presence in Low-Earth Orbit (LEO):
 - Increases reliance on Russia by delaying work on a U.S. Reboost/Attitude Control Capability;
 - Delays development of a U.S. Deorbit Vehicle (USDV) for the ISS, increasing the risk to public safety associated with an uncontrolled and unpredictable ISS deorbit;
 - Eliminates a minimum of 3 cargo flights, limiting ISS research output during its most productive period; and,
 - Delays Commercial LEO Development effort, significantly increasing the risk of a gap in U.S. human presence in LEO.

- Delays implementation of new Artemis communications capabilities via development of Lunar Relay mission and Communications Services awards, putting at risk planned robust comms/ navigation ability at end of decade to communicate with spacecraft in cislunar space and LEO.

NASA STEM Engagement: Reduction of \$31.6M from FY 2023 enacted level, for a FY 2024 level of \$111.9M

- Substantially reduce base awards for each Space Grant consortium from \$0.9M to \$0.6M.
- Reduce number of EPSCoR awards, directed at jurisdictions that have not participated equably in competitive aerospace and aerospace-related research activities, by 4, from 15 to 11.
- Reduce number of MUREP Institutional Research Opportunity awards by 5, from 10 to 5.

NASA Safety, Security, and Mission Support: reduction of \$700M from FY 2023 enacted level, for a FY 2024 level of \$2.4B

- Reduce SSMS budget below FY 2019 enacted level.
- Requires ~1,700 NASA Center workforce reduction and ~2,400 on-site Center support contractor workforce reduction
 - Hiring freezes, furloughs, RIFs, layoffs. – These numbers would grow significantly if personnel actions were delayed from the beginning of FY 2024.
- NASA Facilities Infrastructure approach would be “run to failure” for most facilities, meaning that no proactive or preventative maintenance would be performed.
- Impacts reliability and availability of labs, test facilities, and engineering facilities to support mission milestones in Artemis and other key NASA programs.
- Reduces funding for Agency/Center Technical Authorities, with limited/delayed independent assessments and erosion of NASA checks/balances to ensure adequate safety posture.
- Debilitating reductions to IT services causing catastrophic impacts for mission success with funding for critical Cybersecurity issues limited and recent gains in security posture improvements reversed.

NASA Construction & Environmental Compliance and Restoration (CECR): Reduction of \$91M from FY 2023 enacted level, for a FY 2024 level of \$323M

- Defer numerous Construction of Facilities (COF) and Environmental Compliance and Restoration (ECR) projects, including critical safety and compliance projects across all 10 NASA Centers.
 - Inability to meet planned work at Santa Susana Field Laboratory in California and other sites.
- Cancel significant repair/compliance projects, impacting NASA’s ability to effectively maintain NASA infrastructure, reducing NASA’s ability to prepare for emerging mission needs, decreasing the reliability of systems, and increasing failure rates for critical facilities across NASA.

**Impacts to NASA Programs of a FY 2024 Budget Level
Equal to FY 2022 NASA Enacted Level**

A FY 2024 NASA budget equal to the FY 2022 NASA enacted level would be \$24.0B, or a reduction of \$1.342B from the FY 2023 enacted level. Information below outlines, by NASA Mission Directorate, how such a \$1.342B reduction would impact Agency missions.

NASA Science: Reduction of \$181M from FY 2023 enacted level, for a FY 2024 level of \$7.614B

A reduction of this magnitude would threaten NASA's ability to continue making critical advancements in all Science disciplines, and threaten NASA's international leadership in areas of National priority:

- Planetary Science: Significant impacts to Planetary missions and research:
 - Delay the Mars Sample Return (MSR) mission, a partnership with the European Space Agency to bring the first samples of Mars material back to Earth for detailed study, including samples already collected/cached by the Mars Perseverance Rover. Delay would threaten U.S leadership of this groundbreaking mission, undermine U.S. competition with China, and increase mission risk with further aging of Perseverance rover.
 - Delay DAVINCI, a mission to study the origin, evolution, and present state of Venus in unprecedented detail from near the top of the clouds to the planet's surface.
 - Delay Dragonfly, a mission to deliver a rotorcraft to Saturn's moon Titan to advance our search for the building blocks of life.
- Earth Science: Significant impacts to Earth Science missions, research and technology, including the Earth System Observatory (ESO).
 - Cancel at least one ESO mission and delay three ESO missions by 1-2 years. ESO will provide key information to guide efforts related to climate change, natural hazard mitigation, fighting forest fires, and improving agricultural processes. Cancellation/delays would threaten international contributions and delay advances in Decadal Survey-recommended science, potentially ceding U.S. leadership in climate research.
 - Significantly delay Landsat Next mission, which provides continuity of the longest space-based record of Earth's land surface and new capabilities for the next generation of Landsat users.
 - Delay new competitive opportunities in Earth Explorer program for small/ medium-sized instruments/missions to address key Earth science and applications needs
- Astrophysics: Significant impacts include:
 - Delay all future Astrophysics competitive mission opportunities, including the first Decadal Survey recommended Probe-class mission and Explorers missions
- Heliophysics: Significant impacts to Heliophysics missions and research:
 - Delay of Multi-Slit Solar Explorer (MUSE) mission to understand forces driving heating/eruptions of Sun's corona at the foundation of space weather.
- Biological and Physical Sciences:
 - Cancel the Commercially Enabled Rapid Space Science (CERISS) initiative to dramatically expand commercially developed in situ sample prep/analysis

capabilities, limiting the transformational science that could be achieved for Low-Earth Orbit research in the post ISS era.

NASA Aeronautics: Reduction of \$54.3M from FY 2023 enacted level, for a FY 2024 level of \$881M

- Significant delays/rescopes to critical elements of NASA’s Sustainable Flight National Partnership which supports the aviation community’s goal of net-zero carbon emissions by 2050 and increased aircraft efficiency, enabling reduced cost for traveling public and continued U.S. competitiveness.
 - Cancel one of two demonstrations included in the Electrified Powertrain Flight Demonstration project and delay the other demonstration;
 - Delay/rescope the Sustainable Flight Demonstrator project flight demonstrator;
- Delay the Hi-Rate Composite Aircraft Manufacturing Project demonstrations;
- Delay the Hybrid Thermally Efficient Core project demonstration.
- Reduce number of University Leadership Initiative awards supporting zero emissions aviation and advanced materials, reducing number of schools/students involved in ULI, impacting the pipeline of aviation science and engineering leaders needed to support U.S. aviation industry.

NASA Space Technology: Reduction of \$100M from FY 2023 enacted level, for a FY 2024 level of \$1.1B

- Cancel On-Orbit Servicing, Assembly & Manufacturing (OSAM-2) project, impacting NASA ability to advance the national capability for assembly and deployment of complex structures in space.
- Reduce 2023 Announcement of Collaboration Opportunities/ Tipping Point selections by ~70%, preventing development of core technologies for national/commercial needs, including Artemis.
- Cancel Fission Surface Power (FSP) project, disrupting NASA’s partnership with DOD and DOE to deliver clean energy for multiple government applications including Artemis missions.
- Cancel new Space Technology Research Institutes (STRI) and Lunar Surface Technology Research Opportunities (LuSTR) projects, impacting university participation in a diverse and powerful U.S. aerospace technology community through conducting technology research and development.

NASA Exploration: Reduction of \$677.2M from FY 2023 enacted level, for a FY 2024 level of \$6.8B

In the recent Artemis I mission, NASA accomplished successful flight demonstration of a crew capable vehicle traveling to the Moon and returning safely to earth. Significant effort is underway to build on that success with the Artemis II, Artemis III, and Artemis IV missions, all planned to occur within the next 4 years. Artemis II will accomplish the first crewed mission to the Moon since Apollo 17, 51 years ago, and demonstrate deep-space crew launch/return capability of the SLS/Orion system. Artemis III will return American Astronauts to the surface of the Moon. During the Artemis Campaign, NASA will land the first woman and first person of color on the Moon and restart lunar sample return toward Decadal Science objectives. Artemis IV will initiate the sustained lunar operation model with Gateway’s delivery to lunar orbit, initial Gateway expansion with HAB through the international partnership with ESA delivered by SLS

Block 1B and crewed Orion, and demonstration of sustained HLS docking with Gateway for crew exchange and continued exploration of the lunar surface.

Actions for Artemis II, Artemis III, and Artemis IV missions are planned in FY 2024 and beyond:

- SLS rocket, Orion crew capsule, and ground systems - Production of flight units for Artemis II-IV; initial crew capability on Artemis II; development and implementation of Orion docking, and SLS Block 1B upgrades;
- Human lunar lander system (HLS) Initial Capability Option A with SpaceX for Artemis III;
- xEVAS Lunar Surface Suit Development with Axiom for Artemis III+;
- Gateway Initial Capability Development for PPE/HALO with Maxar/NG for Artemis IV+;
- HLS Option B – Sustained Lander Development with SpaceX for Artemis IV+.

Actions for efforts beyond Artemis IV are planned in FY 2024 and beyond:

- HLS App P – New industry Lander development for Artemis V to maintain competition (award planned for Summer 2022);
- Lunar Terrestrial Vehicle – Development of an unpressurized rover for Artemis V and beyond;
- SPEC (SLS Stages Contract that builds Artemis III,IV Core stages and procure Materials for stages for Artemis V, VI) - Definitized December;
- OPOC (Orion Production for Artemis VI-VIII) (ATP in September 2022).

Actions for Artemis V and beyond are planned in FY 2024 and beyond:

- EPOC RFP release (SLS Stages Contract the supports Artemis V+);
- Pressurized rover; including international partner agreements and HLS Cargo Landing;
- Lunar surface habitation and Science Systems.

Specific Exploration Impacts from a FY 2024 funding level of \$6.792B (equal to FY 2022 enacted (-\$677.2M below FY 2023 enacted):

- Substantially delay Artemis IV launch date.
- Terminate or not award new contracts for the system production/development (including already-developed/designed systems) that support work on Artemis V and beyond.
 - These actions would include not issuing planned award for HLS Appendix P for a new competitive entrant, the LTV that would support mobile Lunar exploration, and some portion of the SLS and Orion production contracts for Artemis V and beyond.
 - Layoffs would occur on some contracts.
- Halt any potential Mars development efforts.

<p>NASA Space Operations: Reduction of \$209M from FY 2023 enacted level, for a FY 2024 level of \$4.0B</p>
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- Substantially increases risk to U.S. presence in Low Earth Orbit (LEO):
 - Increases reliance on Russia by delaying work on a U.S. Reboost/Attitude Control Capability,
 - Delays development of a US Deorbit Vehicle (USDV), increasing , the risk to public safety associated with an uncontrolled and unpredictable ISS deorbit.

- Eliminates a minimum of one cargo flight, limiting ISS research output during its most productive period, and,
- Delays Commercial LEO Development efforts, significantly increasing the risk of a gap in human presence in LEO.
- Delays implementation of new Artemis communications capabilities via development of Lunar Relay mission and Communications Services awards, putting at risk planned robust comms/ navigation ability at end of decade to communicate with spacecraft in cislunar space and in LEO.

NASA Safety, Security, and Mission Support: reduction of \$109M from FY 2023 enacted level, for a FY 2024 level of \$3.2B

- Requires over 400 NASA Center workforce reduction and over 600 on-site Center support contract workforce reduction – Delaying reduction after October 1 will required greater reductions
 - Hiring freezes, furloughs, potential RIFs
- Impacts reliability and availability of labs, test facilities, and engineering facilities to support mission milestones in Artemis and other key programs.
- Reduces funding for Agency and Center level Technical Authorities, with fewer independent assessments and erosion of NASA checks/balances to ensure adequate safety posture.

NASA Construction & Environmental Compliance and Restoration (CECR): Reduction of \$4.0M from FY 2023 enacted level, for a FY 2024 level of \$424.3M

- Defer numerous Construction of Facilities (COF) across NASA Centers.