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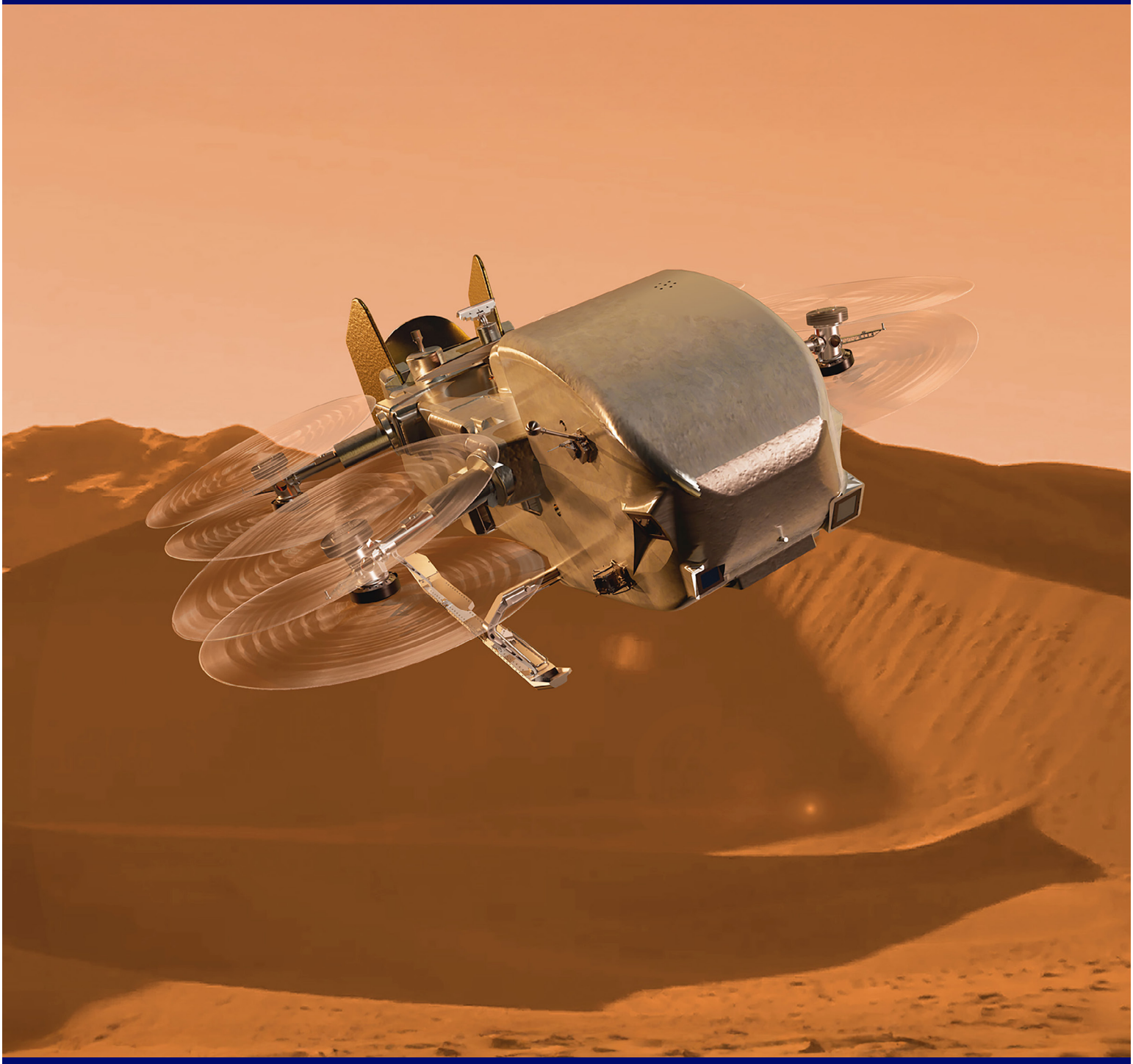
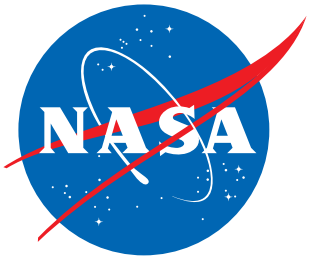
NASA's Management of the Dragonfly Project



September 9, 2025 **IG-25-011**



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RESULTS IN BRIEF

NASA's Management of the Dragonfly Project

September 9, 2025 IG-25-011 (A-24-13-00-SARD)

WHY WE PERFORMED THIS AUDIT

In June 2019, NASA selected Dragonfly as the Agency's next mission under its New Frontiers Program, which seeks to answer questions about the solar system. Dragonfly, a rotorcraft lander with eight rotors that will fly like a large drone, is designed to gather sample materials from Saturn's largest moon, Titan, and determine surface composition in different geologic settings. The rotorcraft will be powered by a radioisotope power system and fly to dozens of locations to characterize the habitability of Titan's environment, investigate how far prebiotic chemistry has progressed, and look for prebiotic chemical processes—precursors of the origin of life.

Dragonfly is a Principal Investigator-led mission managed by the Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Maryland. Although at the time of selection, the mission was expected to launch in April 2026, in September 2020, NASA directed project officials to change Dragonfly's launch readiness date to January 2027 due to the Agency's inability to fully fund the project's plan. In January 2022, Dragonfly was approved to continue development with an updated estimated life-cycle cost range of $2.1 to $2.5 billion and expected launch date of June 2027. Then in March 2023, NASA directed project officials to initiate a replan due to funding constraints. The replan, which was completed in July 2023, included new cost, staffing, and schedule plans. As a result, the project estimated a new launch readiness date of July 2028 with an expected arrival at Titan in 2034. By the time NASA formally established the project's cost and schedule baseline in April 2024, life-cycle costs had grown to $3.35 billion and the launch readiness date was delayed by over 2 years.

In this audit we examined NASA's management of the Dragonfly project relative to cost, schedule, risk, and technical performance. Specifically, we assessed (1) whether the project had effective cost and schedule plans in place and if they were performing according to those plans and (2) how the cost of the Dragonfly mission impacts the future of other New Frontiers Program missions within the Planetary Science Division (PSD) portfolio. Our assessment included a review of NASA and APL project documents, such as the Dragonfly project plan, international agreements, acquisition planning documentation, and monthly status reports. Additionally, we interviewed NASA officials from the Science Mission Directorate, PSD, the Office of the Chief Financial Officer, the Radioisotope Power Systems Program Office, and APL project management officials.

WHAT WE FOUND

Dragonfly has experienced significant cost increases and schedule delays primarily due to decisions made by NASA management. Dragonfly was selected under a New Frontiers Announcement of Opportunity with a $850 million cost cap on Principal Investigator-Managed Mission Costs, which primarily includes development costs but excludes launch vehicle and post-launch operations costs. However, by April 2024, those costs had grown to $2.6 billion and the launch delayed by more than 2 years, from April 2026 to July 2028. The cost increase and schedule delay were largely the result of NASA directing APL to conduct four replans between June 2019 and July 2023 early in Dragonfly's development. Justifications for these replans included the COVID-19 pandemic, supply chain issues, changes to accommodate a heavy-lift launch vehicle, projected funding challenges, and inflation.

We also found that NASA allowed Dragonfly development to proceed under less than ideal circumstances. For example, while a NASA senior management review determined in November 2023 that Dragonfly had met the technical requirements to proceed to the next life-cycle phase of development, due to uncertainty in the fiscal year (FY) 2025 budget, management gave the project authority to begin the next phase's work, not to exceed the limits of FY 2024 funds, but did not formally authorize the project to continue into the next phase. Although this authority is atypical and had not previously been used by the Science Mission Directorate, the decision allowed the project to begin development work instead of delaying that work until the Agency completed the FY 2025 budget process. In our opinion, considering the multiple delays and corresponding cost increases the project had already experienced, we believe the reasoning behind NASA's decision and limiting the project's work to existing FY 2024 funds was sound. Dragonfly was subsequently granted authority to formally proceed to the next phase in April 2024 with a cost baseline of $3.35 billion and a July 2028 launch readiness date. However, despite establishment of cost and schedule baselines, as of July 2025, the Dragonfly project plan (dated February 2023) had not been updated to reflect the changes.

In addition, NASA decided to allow Dragonfly to proceed into the next development phase with lower than optimum project cost reserves—known as Unallocated Future Expenses—during final design and fabrication development work. This limited the project's ability to resolve unexpected technical problems and address risks. To address the shortfall, APL plans to re-phase work and delay payments to some of its contractors. The project also plans to delay development and testing activities, which can lead to late risk identification and more costly risk mitigations (in time and money) later in development.

Dragonfly's total life-cycle cost is significantly more than other New Frontiers Program missions and will continue to absorb an increasing proportion of PSD's total budget. While other New Frontiers missions had total life-cycle costs of approximately $1 billion, PSD budget limitations along with Dragonfly's increased costs have delayed the release of the next New Frontiers Program Announcement of Opportunity. In addition, where other New Frontiers missions launched on a 5-year cadence, Dragonfly's original launch date and schedule delays will result in at least a 12-year gap in New Frontiers mission launches.

Lastly, we have concerns about the likelihood of Dragonfly meeting its cost and schedule baseline. As indicated by APL's Earned Value Management (EVM) System—a project management tool designed to objectively measure and assess a project's cost and schedule performance—the project's cost and schedule performance is poorer than planned. Further, NASA's Office of the Chief Financial Officer identified potential issues with the accuracy and validity of APL's EVM System and asked the Defense Contract Management Agency to perform an independent assessment of that system.

WHAT WE RECOMMENDED

To build upon the effectiveness of NASA project management, increase the likelihood of mission success within the established cost and schedule commitment, ensure programmatic balance in the future, and ensure compliance with NASA policy to accurately reflect cost and schedule baseline commitments, we recommended the Associate Administrator for Science Mission Directorate (1) document lessons learned from the decision to begin Phase C development work prior to establishing a baseline commitment, (2) update Dragonfly's project plan to reflect baseline commitments, (3) maintain adequate levels of Unallocated Future Expenses to support the Dragonfly project through Phase D, (4) ensure APL timely implements any recommendations needed to bring the EVM System into compliance, and (5) ensure the science community is informed of updates to the expected scope and cadence for future New Frontiers missions.

We provided a draft of this report to NASA management who concurred with our recommendations and described planned actions to address them. We consider management's comments responsive; therefore, the recommendations are resolved and will be closed upon completion and verification of the proposed corrective actions.

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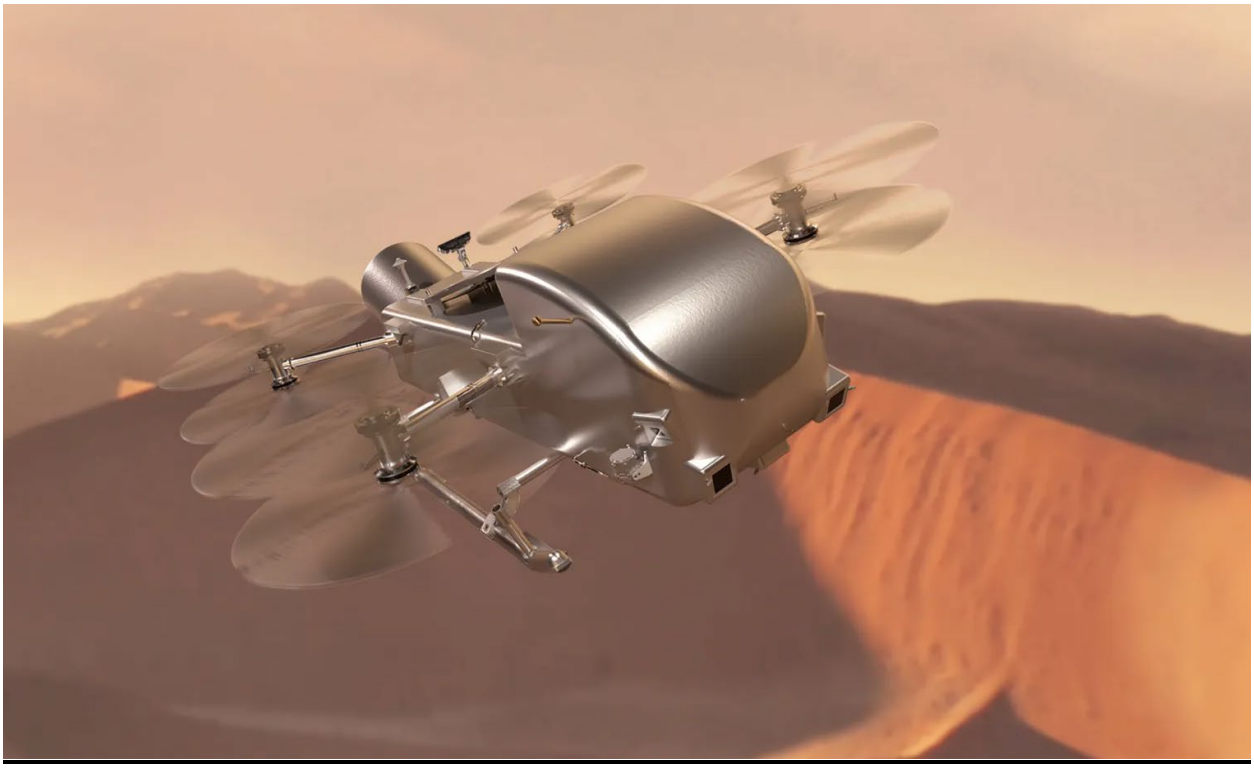
Acronyms

ABC	Agency Baseline Commitment
APL	Applied Physics Laboratory
APMC	Agency Program Management Council
DCMA	Defense Contract Management Agency
EVM	Earned Value Management
FY	fiscal year
KDP	Key Decision Point
MMRTG	Multi-Mission Radioisotope Thermoelectric Generator
OIG	Office of Inspector General
OSIRIS-APEX	Origins, Spectral Interpretation, Resource Identification and Security–Apophis Explorer
OSIRIS-REx	Origins, Spectral Interpretation, Resource Identification and Security–Regolith Explorer
PIMMC	Principal Investigator-Managed Mission Cost
PMPO	Planetary Missions Program Office
PSD	Planetary Science Division
SMD	Science Mission Directorate
UFE	Unallocated Future Expenses

INTRODUCTION

In June 2019, NASA selected Dragonfly as the Agency's next mission under its New Frontiers Program, which seeks to answer questions about the solar system. Dragonfly is a Principal Investigator-led mission, managed by the Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Maryland, to explore Saturn's largest moon, Titan (see Figure 1).[1] Dragonfly, a rotorcraft lander with eight rotors that will fly like a large drone, is designed to gather sample materials from Titan and determine surface composition in different geologic settings. The rotorcraft will be powered by a radioisotope power system and fly to dozens of locations looking for prebiotic chemical processes—precursors of the origin of life—common on both Titan and Earth.[2] Specifically, the mission concept includes the capability to explore diverse locations to characterize the habitability of Titan's environment, investigate how far prebiotic chemistry has progressed, and search for chemical signatures that could indicate water-based and hydrocarbon-based life.

Figure 1: Artist's Concept of Dragonfly Soaring over the Dunes of Saturn's Moon Titan



Source: NASA/APL/Steve Gribben.

[1] A Principal Investigator is a person who conceives an investigation and is responsible for carrying it out and reporting its results. In some cases, Principal Investigators from industry and academia act as project managers for smaller development efforts with NASA personnel providing oversight.

[2] A radioisotope power system is a type of nuclear energy technology that uses heat to produce electric power for operating spacecraft systems in environments where solar energy cannot or would be inefficient. That heat is produced by the natural radioactive decay of plutonium-238.

Since NASA selected Dragonfly, the project has undergone multiple replans impacting cost and schedule. At the time of selection, the mission was expected to launch in April 2026. However, in September 2020, NASA directed project officials to change Dragonfly's launch readiness date to January 2027 due to the Agency's inability to fully fund the project's plan to achieve the earlier launch date. In January 2022, Dragonfly was approved to continue development with an updated estimated life-cycle cost range of $2.1 to $2.5 billion and expected launch date of June 2027. Then in March 2023, NASA directed project officials to initiate a replan due to funding constraints. The replan, which was completed in July 2023, included new cost, staffing, and schedule plans. As a result, the project estimated a new launch readiness date of July 2028 with an expected arrival at Titan in 2034. By the time NASA formally established the project's cost and schedule baseline in April 2024, life-cycle costs had grown to $3.35 billion and the launch readiness date was delayed by over 2 years.

In this audit, we determined whether NASA is effectively managing the Dragonfly project relative to cost, schedule, risk, and technical performance. Specifically, we assessed (1) whether the project had effective cost and schedule plans in place and if they were performing according to those plans and (2) how the cost of the Dragonfly mission impacts the future of other New Frontiers Program missions within the Planetary Science Division (PSD) portfolio. See Appendix A for details of the audit's scope and methodology.

Background

NASA's Science Mission Directorate (SMD) pursues the Agency's strategic objective to expand human knowledge through new scientific discoveries using aircraft, balloon, and space flight programs to execute remote-sensing and in-situ investigations.[3] SMD also supports basic and applied research and technology to understand naturally occurring Earth and space phenomena and human-induced changes in the Earth system, and to develop Earth and space science-related technologies.[4] SMD received $7.3 billion in fiscal years (FY) 2024 and 2025 and is projected to receive $3.9 billion in NASA's FY 2026 budget request.[5]

Within SMD, PSD manages the exploration of objects in our solar system to better understand its history and the distribution of life within. For example, PSD is currently operating spacecraft at Mars, Jupiter, and the Moon. In addition, PSD launched the Europa Clipper spacecraft in October 2024 to study Jupiter's moon Europa and was planning to send two missions to explore Venus in the next 5 years

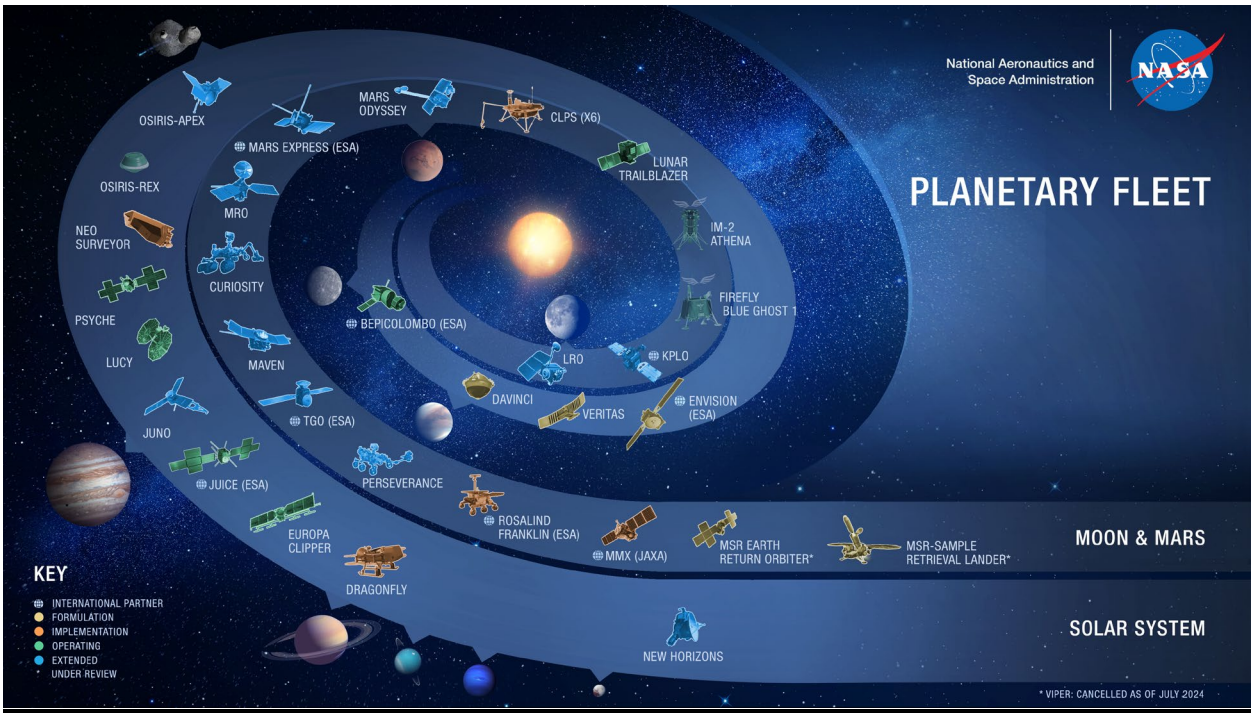
[3] Remote sensing acquires information from a distance. NASA observes Earth and other planetary bodies via remote instruments on space-based platforms, such as satellites and spacecraft, and on aircraft that detect and record reflected or emitted energy. In-situ investigations, meaning "in place," examines, measures, or experiments on something within its natural or original environment.

[4] Basic research is driven by curiosity or interest in a scientific question, with a focus on expanding knowledge rather than to create or invent something. On the other hand, applied research is designed to solve practical problems of the modern world, rather than to acquire knowledge for knowledge's sake.

[5] On March 15, 2025, Congress passed the Full-Year Continuing Appropriations and Extensions Act, 2025, Pub. L. No.119-4. The Act, known as a continuing resolution, funded most programs and activities at FY 2024 levels. Continuing resolutions are temporary spending bills that allow federal government operations to continue when final appropriations have not been approved by Congress and the President.

(see Figure 2 for NASA's fleet of current and planned planetary missions).[6] PSD received $2.8 billion in FYs 2024 and 2025 and is projected to receive $1.9 billion in NASA's FY 2026 budget request. PSD's budget supports current and future competitive mission selections within its New Frontiers and Discovery programs and a research program to support the scientists who use NASA mission data to make discoveries about our solar system.[7]

Figure 2: NASA's Fleet of Current and Planned Planetary Missions (as of May 2025)



Source: NASA.

NASA's New Frontiers Program

Managed by the Planetary Missions Program Office (PMPO) at Marshall Space Flight Center, the New Frontiers Program is designed to accomplish focused planetary science investigations using innovative and efficient management approaches. Its prime objective is to answer unique science questions in the exploration of the solar system. New Frontiers aims to improve mission performance using validated new technologies, efficient management, and control of design, development, and operations costs.

[6] Europa Clipper will travel 1.8 billion miles to reach Jupiter in April 2030 and try to determine if Jupiter's icy moon Europa has habitable conditions. The spacecraft will orbit Jupiter and conduct 49 close flybys of Europa. On May 30, 2025, NASA released its FY 2026 budget request that proposed terminating six current and planned planetary science missions, including the two missions to explore Venus. Cancellation or termination for specific projects are footnoted in this report where the respective missions are defined and discussed.

[7] The New Frontiers Program selects missions from a pool of proposals for cost-capped solar system-related projects. Like New Frontiers, the Discovery Program selects missions from a pool of proposals to provide frequent flight opportunities for high-quality, high-value, focused planetary science investigations that can be accomplished under a not-to-exceed cost cap that is lower than that imposed on New Frontiers missions.

Investigation proposals are solicited via the Announcement of Opportunity process.[8] Mission proposals are led by a Principal Investigator who is typically affiliated with a university or research institution and selected through an extensive competitive peer review process. The Principal Investigator is responsible for the overall success of the project by assuring that cost, schedule, and performance objectives are met. The New Frontiers Program includes a cost cap in the Announcement of Opportunity on some, but not all, of the costs that fall under the Principal Investigator-Managed Mission Costs (PIMMC) in an effort to restrict development cost and time.[9]

NASA has three New Frontiers missions in extended operations—New Horizons; Juno; and Origins, Spectral Interpretation, Resource Identification and Security–Regolith Explorer (OSIRIS-REx)—and one mission in primary operations—OSIRIS–Apophis Explorer (OSIRIS-APEX), which repurposed the OSIRIS-REx spacecraft.[10] Dragonfly was selected as part of NASA's fourth request for New Frontiers Program proposals—Announcement of Opportunity 4—which was released in December 2016. In total, 12 proposals were received, and the announcement included an $850 million PIMMC cost cap (in FY 2015 dollars).[11]

The Dragonfly Mission

In November 2024, NASA selected a Space Exploration Technologies Corp (SpaceX) Falcon Heavy rocket to launch Dragonfly from Kennedy Space Center in July 2028.[12] After launch and prior to landing, the cruise stage will provide the propulsion, guidance and control, and telecommunications needed for Dragonfly to travel between Earth and Titan. During this 6.5-year period, an entry, descent, and landing assembly—which includes the functions needed for a safe descent to Titan such as a heat shield, parachute system, and separation systems—will protect Dragonfly in cruise and during its entry into and 90-minute descent through Titan's thick atmosphere by parachute. Dragonfly will then separate from the entry, descent, and landing assembly and land on Titan under its own power using its eight sets of 53-inch-long rotors (see Figure 3).

The power source for both the cruise stage and Dragonfly is the radioisotope power system—a Multi-Mission Radioisotope Thermoelectric Generator (MMRTG) developed and provided by the U.S. Department of Energy—that will provide heat and power the battery used to fly the rotorcraft,

[8] An Announcement of Opportunity is used to solicit proposals for unique, high-cost research investigation opportunities that typically involve flying experimental hardware provided by the proposer on one of NASA's Earth-orbiting or free-flying space flight missions.

[9] The PIMMC is a set of costs that are managed by the Principal Investigator. The New Frontiers Program has cost caps to encourage efficient management and ensure investigations stay within budget. These cost caps are only for development and do not include the launch vehicle or post-launch operations.

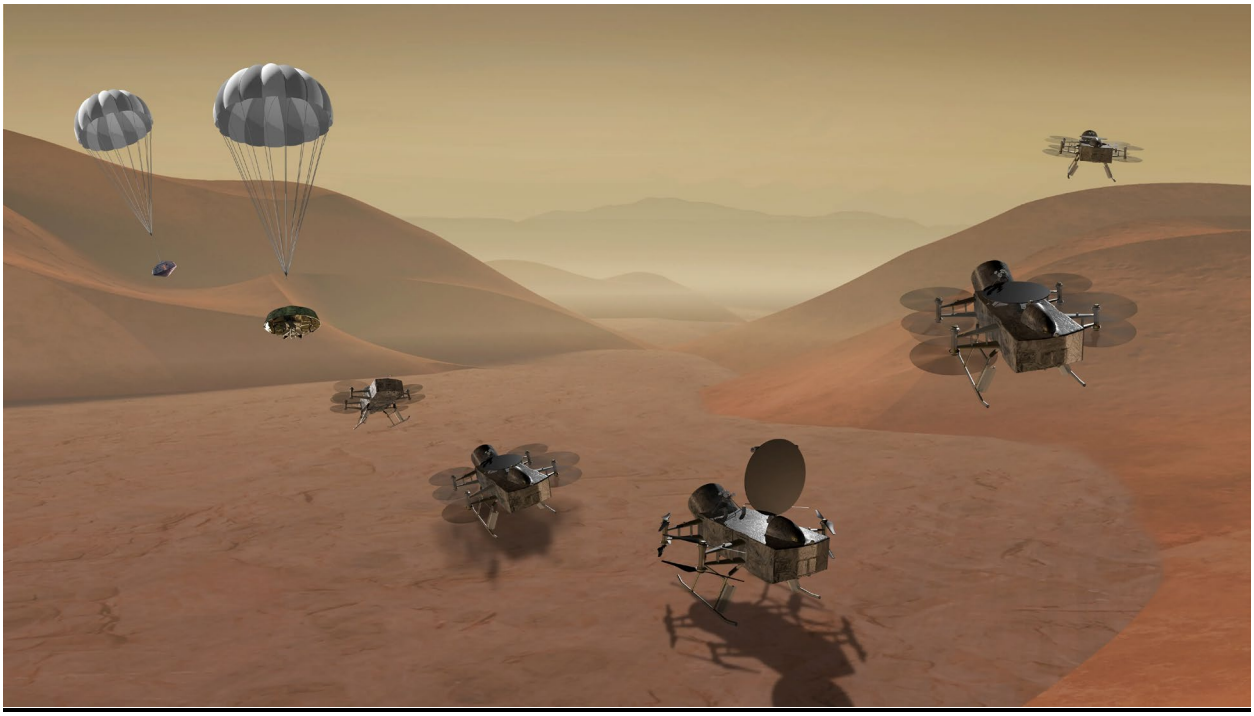
[10] New Horizons launched in January 2006 to explore Pluto, its moons, and other Kuiper Belt objects. The spacecraft flew by Pluto in July 2015 and the Kuiper Belt object named Arrokoth in January 2019. The Juno mission to Jupiter, which launched in August 2011, is now in an extended mission phase and is the Agency's most distant operating planetary orbiter. Launched in September 2016, OSIRIS-REx was the first U.S. mission to collect a sample from an asteroid, which was returned to Earth in September 2023. After dropping off the sample capsule through Earth's atmosphere, the spacecraft was renamed OSIRIS-APEX and sent on a new mission to explore the asteroid Apophis in 2029. The FY 2026 budget request states that the New Horizons, Juno, and OSIRIS-APEX missions will be terminated.

[11] In December 2017, NASA announced that Dragonfly and the Comet Astrobiology Exploration Sample Return mission concept to return a sample from Comet 67P/Churyumov-Gerasimenko were chosen as finalists for selection.

[12] SpaceX's contract is valued at approximately $256.6 million, which includes launch vehicle services and other mission-related costs.

transmit data to Earth, and complete all other operational activities. Dragonfly is about 12.5 feet long, about 12.5 feet wide, and more than 5.5 feet tall, and weighs about 1,900 pounds.

Figure 3: Artist's Concept of Dragonfly Landing on Titan and the Rotorcraft in Flight



Source: NASA.

In addition to the overall objective of characterizing the habitability of Titan, the science objectives of Dragonfly are to (1) sample materials and analyze chemical components and processes at work to produce biologically relevant compounds; (2) measure atmospheric conditions, identify methane reservoirs, and determine transport rates; (3) characterize geologic features, transport processes, seismic activity, and the subsurface structure; (4) constrain processes that mix organics with past surface liquid water or potentially the subsurface ocean; and (5) search for chemical signatures that could indicate biological processes. The mission is a collaboration and partnership of domestic entities and international partners including the Japan Aerospace Exploration Agency, France's Centre National D'Etudes Spatiales, and the German Aerospace Center. Science objectives will be achieved by analysis of measurements from Dragonfly's five primary instruments provided by various NASA centers, contractors, subcontractors, and international partners (see Table 1).

Table 1: Dragonfly Instruments and NASA Partners

Dragonfly Instrument	Partner(s)
DraGMet: The Dragonfly Geophysics and Meteorology Package is a suite of geophysical and meteorological sensors, including a seismometer to detect "Titanquakes" and understand Titan's interior and liquid subsurface ocean.	APL and Japan Aerospace Exploration Agency
DraMS: The Dragonfly Mass Spectrometer performs molecular analysis on surface samples that are acquired and delivered by the Drill for Acquisition of Complex Organics (DrACO).	Goddard Space Flight Center and Centre National D 'Etudes Spatiales
DrACO: The Drill for Acquisition of Complex Organics will extract material from Titan's surface and deliver it to DraMS.	Honeybee Robotics
DragonCam: Science Camera Suite and Navigation Cameras will characterize landforms and surface processes and conduct surface and aerial imaging.	Malin Space Science Systems
DraGNS: The Dragonfly Gamma-ray and Neutron Spectrometer will measure the elemental composition of Titan.	APL and Lawrence Livermore National Laboratory

Source: NASA Office of Inspector General (OIG) analysis of Agency data.

In addition to the mission partnerships for the instruments, the Dragonfly team includes numerous partners that will be responsible for various components of the mission (see Table 2).

Table 2: Dragonfly Mission Components and NASA Partners

Dragonfly Mission Component	Partner(s)
Rotorcraft/Lander	APL, Moog Inc., Collins Aerospace, Sikorsky, Pennsylvania State University, and University of Central Florida
Aeroshell and Cruise Stage	Lockheed Martin Corporation
Entry, Descent, and Landing Analysis; Parachutes; and Dragonfly Entry Aerosciences Measurements (DrEAM)[a]	Ames Research Center, Langley Research Center, and the German Aerospace Center
Multi-Mission Radioisotope Thermoelectric Generator (MMRTG)	NASA Radioisotope Power Systems Program Office and the U.S. Department of Energy
Mission Operations/Navigation	The Jet Propulsion Laboratory and APL

Source: NASA OIG analysis of Agency data.

[a] DrEAM is an instrumentation suite for the Dragonfly mission's entry vehicle heat shield and backshell.

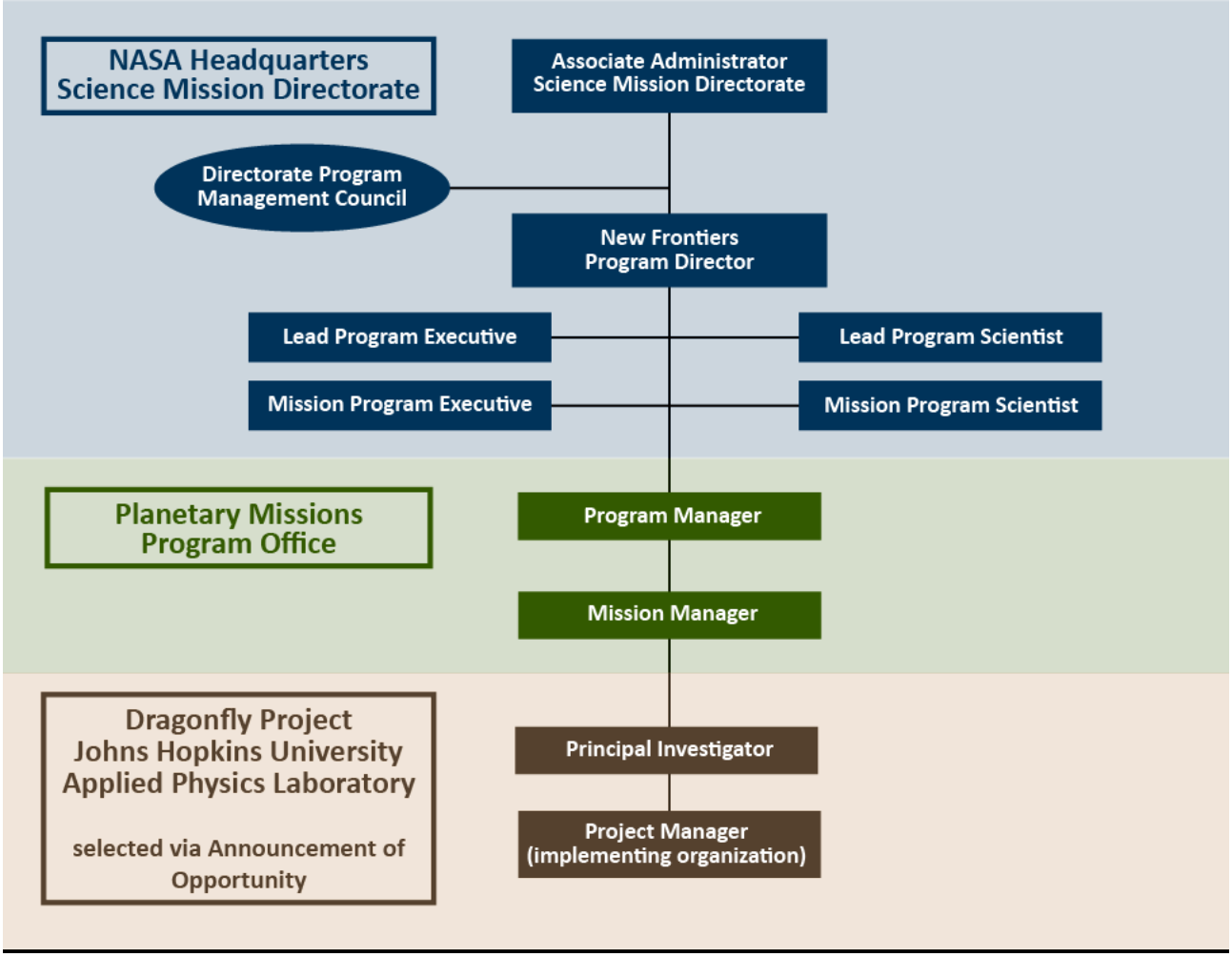
Dragonfly Governance Structure

Dragonfly's governance structure is consistent with NASA Procedural Requirements 7120.5F and its project authority is documented within the Planetary Missions Program Plan.[13] As such, the PMPO is responsible for Dragonfly program management and is the technical authority for safety, mission assurance, and engineering. They are the primary interface to the Dragonfly Project Office at APL, as well as SMD for mission objectives, requirements, schedule, and a funding profile. Funding for

[13] NASA Procedural Requirements 7120.5F, *NASA Space Flight Program and Project Management Requirements w/Change 4* (August 3, 2021), and NASA PMP-PLAN 001, *Planetary Missions Program Plan with Change 1* (December 18, 2015).

Dragonfly is provided to APL via a task order on the Aerospace, Research, Development, and Engineering Support Services contract as an Agency-wide indefinite-delivery, indefinite-quantity contract.[14] The PMPO assigned a Dragonfly Mission Manager to be responsible for the project and serve as the primary interface with the Dragonfly Principal Investigator and Project Manager at APL. The PMPO reports to the PSD Associate Director for Flight Programs at NASA Headquarters, who serves as the New Frontiers Program Director. PSD assigns a Program Executive and Program Scientist for the mission that works with the Mission Manager and APL to report directly to SMD. See Figure 4 for the Dragonfly management organization.

Figure 4: Management Organization for the Dragonfly Mission



Source: NASA OIG presentation of Agency information.

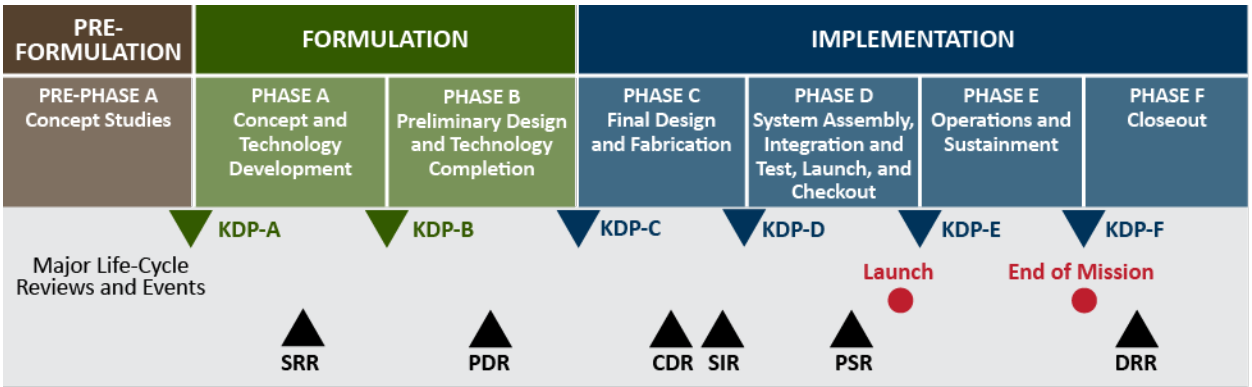
[14] NASA awarded APL the first Aerospace, Research, Development, and Engineering Support Services contract in October 2006 and issued a second contract in March 2020. With a combined value not to exceed $3.8 billion, the contracts provide a vehicle to issue task orders—an order for services or goods placed against an established contract—for robotic space missions and supporting research. An indefinite-delivery, indefinite-quantity contract allows the government to purchase goods or services over a set period without specifying the exact quantities in advance.

APL is responsible for project management, mission implementation, system design, system integration and testing, instrument management, mission operations, and project science. The APL Dragonfly Project Office is responsible for project contingencies (reserves) for cost and schedule, technical descope options, and technical resource margins. The APL Dragonfly Project Manager has the authority, responsibility, and accountability defined in NASA Procedural Requirements 7120.5F to execute the mission per the life-cycle management process.

NASA Life-Cycle Management Process

One of the fundamental concepts used within NASA for the management of major systems is the program and project life cycle. NASA divides the life cycle of its programs and projects into two major phases—Formulation and Implementation—that are further divided into Phases A through F. Formulation consists of Phases A and B, and Implementation is Phases C through F. Periodic reviews, such as the Preliminary Design Review and Critical Design Review, assess the maturity of the design and determine whether the program or project is ready to proceed to the next phase. This structure also allows managers to assess the progress of their programs and projects at Key Decision Points (KDP) throughout the process (see Figure 5). Specifically, KDPs are the events at which the Decision Authority determines the readiness of a program or project to progress to the next phase of the life cycle (or to the next KDP) and are defined so they provide natural points for "go" or "no-go" decisions. A program or project that fails to pass a KDP may be allowed to try again later after addressing deficiencies that precluded passing the KDP, or it may be terminated.

Figure 5: NASA Program and Project Life-Cycle Phases



A **Key Decision Point (KDP)** is an event where NASA determines whether a program or project is ready to move to the next phase of its life cycle and establishes content, cost, and schedule commitments for that phase.

System Requirements Review (SRR) evaluates whether the functional and performance requirements for the system meet the needs of the program or project and represent achievable capabilities.

Preliminary Design Review (PDR) evaluates completeness and consistency of the planning, technical, cost, and schedule baselines developed during Formulation.

Critical Design Review (CDR) evaluates the program or project design to meet mission requirements with appropriate margins and acceptable risk.

System Integration Review (SIR) evaluates whether the program or project is ready for integration and test, can be completed with available resources, and is ready for Phase D.

Pre-Ship Review (PSR) ensures the completeness of any item of hardware or software before it is released to another facility for integration with a larger system or the spacecraft.

Disposal Readiness Review (DRR) evaluates the readiness of the program or project and system for a disposal event, such as deorbiting.

Source: NASA OIG presentation of information from NASA Procedural Requirements 7120.5F.

NASA Is Challenged to Manage Dragonfly's Increased Cost in a Budget Constrained Portfolio

Dragonfly has experienced significant cost increases and schedule delays. Despite being selected under a New Frontiers Announcement of Opportunity with a $850 million cost cap, the PIMMC has grown to $2.6 billion and the launch readiness date has been delayed by more than 2 years.[15] The cost increase and schedule delay were in large part the result of NASA directing APL to conduct four replans prior to Dragonfly entering the Implementation Phase. After the project spent nearly 5 years in the Formulation Phase, NASA decided to proceed into the Implementation Phase with lower than optimal project Unallocated Future Expenses (UFE).[16] This limits the project's ability to resolve unexpected technical problems and address risks. Dragonfly's total life-cycle cost is significantly more than past New Frontiers Program missions and will continue to absorb an increasing proportion of PSD's total budget.[17] Consequently, Dragonfly's increased cost and additional budget constraints within the PSD portfolio have deferred the release of the next New Frontiers Program Announcement of Opportunity. These factors have also contributed to a gap of at least 12 years in New Frontiers mission launches and will jeopardize future priorities outlined in the National Academies of Sciences, Engineering, and Medicine's (National Academies) decadal surveys.[18]

Dragonfly Has Experienced Significant Cost Increases and Schedule Delays

Although NASA selected Dragonfly from an Announcement of Opportunity with an $850 million cost cap, the project was baselined in April 2024 with a total PIMMC of $2.6 billion, which includes Phase E

[15] While the cost cap only included Phases A through D, the total PIMMC for Dragonfly includes development and operations costs, project-managed Unallocated Future Expenses (UFE), a portion of the MMRTG cost, and other costs for items that have been added since Dragonfly's selection, such as communications and integration of the required DrEAM engineering science investigation. The PIMMC does not include launch vehicle and nuclear launch services, NASA-held UFE, or the DrEAM hardware contribution from NASA's Space Technology Mission Directorate. However, any increases in cost for nuclear launch services would need to be absorbed in the PIMMC.

[16] UFE, formally known as cost reserves, are costs expected to be incurred but cannot yet be allocated to a specific sub-element of a program's or project's plan. NASA uses UFE as a cost-risk management tool and allocates some portion of a project's UFE to project managers for their management while the majority of the UFE is often managed at the Agency, mission directorate, or program level above the project. UFE ensures that NASA has sufficient resources to handle unexpected issues that may arise, primarily during the project's Implementation Phase.

[17] The life-cycle cost is the total cost of ownership, including the cost of the launch vehicle, over the planned life cycle from Formulation (excluding Pre-Phase A) through Implementation (excluding extended operations).

[18] Decadal surveys provide detailed insights into the strategic priorities and mission directives set for the next decade across key scientific areas including astrophysics, planetary science, Earth science, heliophysics, and biological and physical sciences. These surveys play a crucial role in shaping NASA's future endeavors, reflecting a broad consensus within the scientific community on the most pressing and promising areas of research.

ground and science operations, a portion of nuclear launch services, project-held UFE, and some other costs not included in the original cost cap (e.g., integration of an engineering science investigation). The cost cap does not preclude NASA from selecting and awarding a contract for a more expensive mission, should the technical objectives be desirable. Moreover, costs increased as Dragonfly's technical complexity was better understood.

In addition to increased technical complexity, multiple replans and major delays have led to Dragonfly's total life-cycle cost exceeding the typical costs of New Frontiers missions. During the project's Formulation Phase, Dragonfly experienced major delays prior to reaching KDP-C.[19] Specifically, the project remained in Formulation Phase B for nearly 5 years from June 2019 to April 2024. When the project first entered Phase B in June 2019, NASA intended for Dragonfly to complete Phase B work and begin the Implementation Phase in September 2022 and directed APL to plan for a launch readiness date of April 2026. In total, Phase B PIMMC increased approximately $640 million—attributable to multiple launch slips due to NASA's constrained early year funding, as well as a better understanding of technical challenges unique to this mission.

During Phase B, NASA directed the project to conduct four replans. Justifications for these replans included the COVID-19 pandemic, supply chain issues, design modifications to accommodate a heavy-lift launch vehicle, projected funding challenges, and inflation. As a result, the project launch readiness date was delayed more than 2 years, from April 2026 to July 2028, from when the mission entered Phase B. Further, these replans increased the PIMMC to nearly two times the proposed cost, as well as the overall mission cost to an amount that is out of family with the costs of past New Frontiers missions. See Table 3 for the history of cost and schedule impacts from these NASA-directed replans prior to KDP-C.

Table 3: Impact of Dragonfly Phase B Replans

Milestone and Date	PIMMC (millions)	PIMCC Increase (millions)	Launch Readiness Date
Replan 1 (June 2019)	$1,638	-	April 2026
Replan 2 (September 2020)	$1,824	$186	January 2027
Replan 3 (April 2021)	$1,838	$14	June 2027
Replan 4 (July 2023)	$2,542	$704	July 2028
Total Impact of Phase B Replans	**-**	**$904**	**2 years and 3 months**

Source: NASA OIG analysis of Agency data.

At Dragonfly's Preliminary Design Review in March 2023, the project passed all technical criteria for the review. However, SMD determined the Agency's budget did not support the project's cost profile. In August 2023, subsequent to the fourth replan, the Standing Review Board, Aerospace Corporation, and PMPO each independently reassessed the updated programmatic aspects—to include cost, schedule, and risks—of the Preliminary Design Review.[20] The Directorate Program Management Council and

[19] KDP-C includes a final assessment of the preliminary design, a determination of whether the program or project is sufficiently mature to proceed to the Implementation Phase, and the establishment of cost and schedule baselines.

[20] The Standing Review Board is an independent advisory board chartered to assess programs and projects at specific points in their life cycle. It provides the program or project, the Decision Authority, and other senior managers a credible, objective assessment of how the program or project is progressing against Agency criteria and expectations. The Aerospace Corporation provides project management, independent multidisciplinary engineering services, testing, consulting, contractor monitoring, and evaluation of programs and projects, including safety and mission assurance.

Agency Program Management Council (APMC) conducted reviews to determine the Dragonfly project's readiness to proceed from the Formulation Phase into the Implementation Phase in September and November of 2023, respectively.[21]

NASA determined the project met the technical requirements to proceed from Formulation Phase B to Implementation Phase C of the project life cycle. However, due to uncertainty in the FY 2025 budget, the APMC gave the project authority to proceed with Phase C development work only up to the limit of FY 2024 funds. Per the APMC Decision Memorandum, the APMC Chair "does not approve the Dragonfly project to formally proceed past KDP-C with follow-up actions. The Chair approves Dragonfly with the Authority to Proceed with Phase C development work in FY 2024, including executing the plan for a July 2028 Launch Readiness Date (LRD) and Mission Critical Design Review (M-CDR) activities."

The APMC Chair granted this authority to the project without allowing it to formally pass KDP-C—meaning the project remained in Phase B officially while beginning Phase C work. SMD was directed to return to the APMC by June 2024 with an updated KDP-C recommendation, as well as to conduct negotiations for the Phase C and D task order on the contract with APL. By delaying the project's KDP-C approval, the establishment of the Agency Baseline Commitment (ABC) to the Office of Management and Budget and Congress, which is established at KDP-C, was postponed to April 2024 once the Agency had completed the FY 2025 budget process.[22]

We spoke with PMPO and Dragonfly project officials who stated they had no prior experience with being granted authority to complete Phase C work while officially remaining in Phase B. While this authority is atypical, the decision allowed the project to begin development work in Phase B, instead of delaying that work until the Agency completed the FY 2025 budget process. In our opinion, considering the multiple delays and corresponding cost increases the project had already experienced in Phase B, we believe the reasoning behind NASA's decision to allow Dragonfly to move forward with Phase C development work in Phase B, while limiting its work to existing FY 2024 funds, was sound.

After the FY 2025 President's budget request was released, SMD returned to the APMC to establish an ABC for the project.[23] Dragonfly project management at APL presented a cost and schedule profile for the project they believed to be executable. In April 2024, the project passed KDP-C and the APMC granted the project authority to formally proceed from Formulation to Implementation with an ABC of $3.35 billion and a July 2028 launch readiness date. However, despite establishment of an ABC, as of July 2025, the Dragonfly project plan (dated February 2023) had not been updated to reflect the cost and schedule baselines. Per NASA Procedural Requirements 7120.5F, the project plan establishes the project's baseline for Implementation, signed by the responsible project manager, program manager, Center Director, and Mission Directorate Associate Administrator. Dragonfly has not documented changes in project requirements and its baseline commitment in the plan. Therefore, its project plan does not accurately reflect the scope of the project, the implementation approach, and the environment within which the project operates.

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[21] The Directorate Program Management Council serves as the primary forum for carrying out the mission directorate's responsibilities for program and project oversight in accordance with NASA Procedural Requirements 7120.5F. The APMC serves as the Agency's senior decision-making body responsible for reviewing Formulation Phase performance, recommending approval, and overseeing implementation of programs and Category 1 projects according to Agency commitments, priorities, and policies.

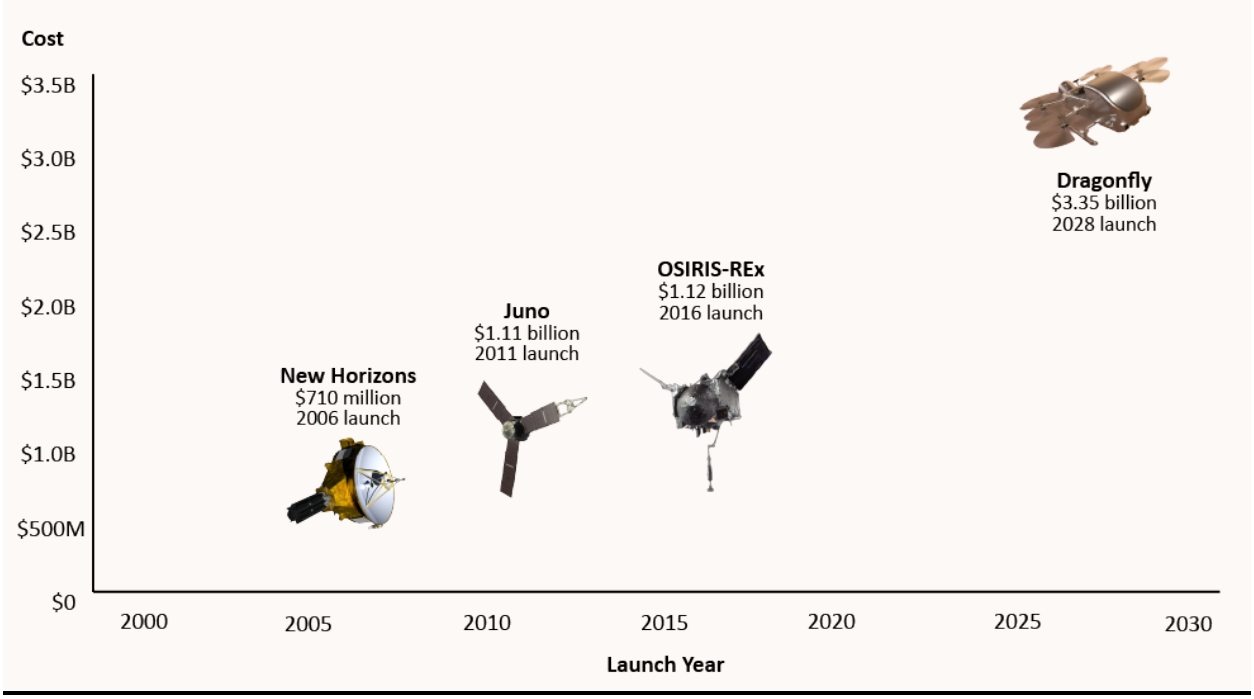
[22] The ABC is the official cost and schedule baseline for a program or project against which NASA's performance is measured and forms the basis for the Agency's commitments to the Office of Management and Budget and Congress.

[23] Office of Management and Budget, *Budget of the United States Government Fiscal Year 2025* (March 11, 2024).

Dragonfly's Cost and Schedule Have Grown Out of Family with Other New Frontiers Missions

The New Frontiers Program is designed to accomplish focused planetary science investigations and aims to reduce total mission cost and development time.[24] Dragonfly has an estimated life-cycle cost of $3.35 billion, and if launched as scheduled in July 2028, it will have been 12 years since the last New Frontiers mission launched. Comparatively, other New Frontiers missions—New Horizons, Juno, and OSIRIS-REx—have life-cycle costs of approximately $1 billion each with 5 years between each of their launches. Figure 6 illustrates the disparity in cost and launch cadence between the four New Frontiers missions. Other than Europa Clipper and Mars Sample Return, with estimated life-cycle costs of $5.2 billion and $7.4 billion, respectively, Dragonfly is the next most expensive single space flight project in PSD's portfolio.[25]

Figure 6: Cost and Launch Cadence of New Frontiers Missions



Source: NASA OIG presentation of Agency data.

Note: Mission costs reflect the ABC at the time the projects were baselined.

[24] Missions under development are at Phase C (final design and fabrication) and Phase D (system assembly, integration and test, and launch) of their life cycle. The primary activities are developmental in nature, including acquisition contract execution.

[25] Mars Sample Return is a partnership between NASA and the European Space Agency to return Martian geological samples to Earth for scientific study. The FY 2026 budget request states that the Agency plans to terminate the Mars Sample Return Program.

Dragonfly's Cost and Schedule Profile Introduces Significant Development Challenges and Delays Future New Frontiers Missions

Dragonfly Faces Significant Development Challenges

With the cost of the Dragonfly project now exceeding $3 billion in total life-cycle cost, NASA decided to proceed into the Implementation Phase with a challenging design, an aggressive schedule, and limited project UFE (cost reserves). Due to the limits of available funding, the project was approved to start Phase C development work with a NASA-provided funding profile that backloaded its allocation of UFE. Backloaded UFE is when a greater amount of cost reserves is allocated to later development years because the amount and phasing of funds needed does not align with project development costs and schedule. Specifically, the Dragonfly project was confirmed at KDP-C with only 18 percent UFE for FY 2025, which is less than the Goddard Space Flight Center standard of baselining a minimum of 25 percent reserves during development.[26]

Inadequate funding and lower project UFE in early development has presented challenges to the project—constraining management's ability to mitigate risks early in development and limiting the project's ability to sufficiently resolve technical problems and address risks. As of July 2025, due to early challenges in development, the Dragonfly project now has a projected negative UFE balance after all risks are accounted for in FY 2025, and project funding needs exceed the FY 2025 allocated budget. Table 4 shows the projected UFE for the project after accounting for the potential cost impact of identified risks.

Table 4: Projected UFE Percentage by Fiscal Year (as of July 2025)

	FY 2025	FY 2026	FY 2027	FY 2028
UFE Percentage	-19%	-16%	-3%	-24%
Goddard UFE Percentage Standard	25%	25%	25%	25%
Percentage Delta	-44%	-41%	-28%	-49%

Source: NASA OIG presentation of Agency data.

To address the shortfall, APL plans to re-phase work and delay payments to some of its contractors. This will likely constrain future UFE and increase the likelihood of continued UFE shortages into the future. The project also plans to delay development and testing activities, which can lead to late risk identification and more costly risk mitigations (in time and money) later in development. The project must monitor their management of UFE from one FY to another and move fabrication and other tasks to later in the schedule. In doing so, they assume funding will be available in the later years.

[26] While not a Goddard Space Flight Center managed project, Dragonfly managers stated that they try to follow Goddard Procedural Requirement 7120.7B, *Funded Schedule Margin and Budget Margin for Flight Projects* (September 17, 2018), which states that projects proceeding into Phase C shall baseline at least 25 percent margin through Phase D. The percentage of UFE to maintain decreases as the project progresses through development. For example, at KDP-D, which for Dragonfly is projected to be in May 2027, the project should have 20 percent margin or higher through Phase D.

Though the project was allowed to adjust their schedule to meet the funding profile and prioritize the necessary activities, PMPO officials stated that funds for the PIMMC were not sufficiently allocated for each year of development. Further, they indicated the project's total cost will ultimately depend on whether PSD allocates sufficient funding to Dragonfly when it is needed.

In April 2025, the Standing Review Board determined the project satisfactorily met the success criteria to pass its Critical Design Review, which evaluated whether the project design met mission requirements with appropriate margins and acceptable risk. However, the Board identified multiple areas of concern, to include performance and delivery concerns for critical instruments (e.g., DraMS and DrACO), an integration and testing schedule that appears unable to accommodate late deliveries of instruments, and several designs still not finalized. As of June 2025, the project's top risks (those with a high probability of occurrence and/or a high consequence to the mission) include lander thermal performance, the lander fuselage panel schedule, fatigue failure of critical flight components, and MMRTG endurance survivability.[27]

Dragonfly Consumes a Significant Portion of the Planetary Science Division Budget

From FY 2019 to FY 2021, Dragonfly Formulation Phase activities accounted for less than 2 percent of the PSD budget. In FY 2022, Dragonfly was funded at $219.1 million—7 percent of PSD's total budget. For FY 2023, Dragonfly was funded at $400.1 million, accounting for over 12 percent of PSD's $3.2 billion budget. For FY 2024, Dragonfly received $360 million, reaching 13 percent of PSD's total budget. For FY 2025, Dragonfly received $408.8 million—almost 15 percent of PSD's $2.8 billion budget. As reflected in Table 5, Dragonfly is expected to absorb an increasing proportion of PSD's total budget through its development.

Table 5: Dragonfly Percentage of Planetary Science Division Budget

	Fiscal Year									
	2019	2020	2021	2022	2023	2024	2025	2026[a]	2027[a]	2028[a]
Dragonfly Budget (millions)	$8	$41	$86	$219.1	$400.1	$360	$408.8	$494.1	$416.9	$337.4
PSD Budget (millions)	$2,747.7	$2,712.6	$2,693.2	$3,120.4	$3,216.5	$2,764.3	$2,785.7	$1,891.3	$1,861.3	$1,867.3
Dragonfly Percentage of PSD Budget	0.3%	1.5%	3.2%	7%	12.4%	13%	14.7%	26.1%	22.4%	18%

Source: NASA OIG analysis of Agency data.

[a] FYs 2026 to 2028 are projected amounts from NASA's FY 2026 budget request.

[27] If the lander's thermal design for the environment on Titan is not sufficient, then the lander's components may exceed their tested temperature limits. If the fuselage panel assembly drawings and internal components are not delivered according to the schedule, this could result in a late delivery of the fuselage for integration and testing with the lander. If there is a fatigue-related failure of a critical flight component on the lander due to the environment, then the lander will be lost, ending the mission before achieving its science objectives. If the vibrations to the MMRTG exceed the heritage design specification, then the MMRTG may fail due to material fatigue after flight.

Earned Value Management Performance and Reporting Concerns

APL is required to have a compliant Earned Value Management (EVM) System for Dragonfly.[28] According to project reporting, overall EVM cost and schedule performance is poorer than planned. Since April 2024, cumulative cost and schedule performance indices have been consistently below 1.0, indicating the project has been over budget and behind schedule since the cost and schedule baselines were established.[29] Specifically, Dragonfly has a cumulative cost performance index of 0.91 and a cumulative schedule performance index of 0.89. The primary unfavorable drivers for these performance scores are related to the project's challenges with development of the flight system, lander, and DragonCam instrument.

We have concerns over the project's cost and schedule performance and the likelihood of it meeting its baseline. However, we are also concerned about the validity of the project's EVM data. During our audit, NASA's Office of the Chief Financial Officer identified potential issues with the accuracy and validity of APL's EVM System. The Agency asked the Defense Contract Management Agency (DCMA) to perform an independent assessment of APL's EVM System.[30] DCMA was tentatively scheduled to conduct the independent assessment in July 2025, with results expected in August 2025. If DCMA determines that APL's EVM data is not sufficiently reliable, the Agency will lack a comprehensive understanding of, and ability to objectively assess, Dragonfly project performance.

Dragonfly's Cost Increases and Schedule Delays Impact New Frontiers Mission Cadence

The New Frontiers Program is meant to support missions that launch on a 5-year cadence. From 2006 to 2016, the Program maintained this optimal cadence, with New Horizons launching in 2006, Juno in 2011, and OSIRIS-REx in 2016. Due to NASA's decision to proceed with Dragonfly's cost and schedule profile, the next New Frontiers Program Announcement of Opportunity was put on hold until at least 2026. Additionally, Dragonfly's cost increases and schedule delays added another 2 years to the launch readiness date, creating at least a 12-year gap in New Frontiers mission launches. With the delay of this Announcement of Opportunity to no earlier than 2026, the next New Frontiers mission would likely launch no earlier than 2033.

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[28] EVM is a project management approach for measuring and assessing project performance through the integration of technical scope and cost objectives during the execution of the project. EVM provides quantification of technical progress with objective performance measurement techniques, enabling management to gain insight into project status and project completion costs and schedules. A validated EVM System by a cognizant federal agency is required for development and production contracts equal to or greater than $100 million.

[29] The cost performance index is a measure of the actual work completed (measured by its earned value) to the actual cost incurred. The schedule performance index is a measure of the actual progress (earned value) to the planned progress. In both cases, a value of 1.0 indicates the project performance is on target. When indices are greater than 1.0, this indicates better-than-planned project performance, while less than 1.0 indicates poorer-than-planned project performance. The formulas used to calculate the indices are generally based on cumulative costs.

[30] A part of the U.S. Department of Defense, DCMA defines and executes the EVM System assessment, and as one part of its mission, is generally responsible for determining EVM System compliance. Although NASA is the cognizant federal agency for APL's EVM System and retains authority to ensure EVM System standards are met, NASA requested DCMA conduct the independent assessment.

The extension of program cadence has significant implications to NASA and its stakeholders. According to the National Academies report, *Proposed Science Themes for NASA's Fifth New Frontiers Mission*, delays in the cadence cause budgetary pressures due to factors such as inflation and supply chain challenges.[31] This can cause further delays and produce an unsustainable cycle for NASA. Further, these delays will cause NASA missions to be out of sync with the National Academies' decadal survey recommendations, which aim to propose mission themes while balancing scientific priorities, programmatic balance, and cost. The National Academies also noted that an unpredictable and irregular cadence will result in an ever-expanding list of proposed New Frontiers mission themes and jeopardize decadal survey priorities. Per a recent study sponsored by SMD, delays in implementing science priorities can keep large segments of the science community in a holding pattern for several years.[32]

[31] National Academies, *Proposed Science Themes for NASA's Fifth New Frontiers Mission* (2025).

[32] NASA SMD, *Large Mission Study Report* (October 2020).

CONCLUSION

Dragonfly—NASA's newest New Frontiers Program mission led by APL—is a rotorcraft lander mission designed to explore diverse locations and characterize the habitability of Saturn's moon, Titan. While previous New Frontiers missions cost approximately $1 billion and launched on a 5-year cadence, Dragonfly's current cost and schedule commitments far exceed predecessor missions. The project's current baseline commitment is $3.35 billion with a July 2028 launch readiness date. Since its selection in 2019, the project has undergone multiple replans impacting cost and schedule, resulting in a life-cycle cost increase of nearly $1 billion and over 2 years of delays.

We found that Dragonfly's complex design, aggressive schedule, and limited UFE introduces significant challenges as the project continues its development. Further, these cost increases and schedule delays have led to an extension of the New Frontiers Program's launch cadence and a corresponding postponement of future New Frontiers missions. The Program that once launched missions on a 5-year cadence will now have at least a 12-year gap in launches. Dragonfly's current EVM performance metrics indicate it is experiencing significant cost and schedule challenges with achieving mission success within established baseline commitments. These challenges may also be compounded by the uncertainty in NASA's future budget environment.

RECOMMENDATIONS, MANAGEMENT'S RESPONSE, AND OUR EVALUATION

To build upon the effectiveness of NASA project management, increase the likelihood of mission success within the established cost and schedule commitment, ensure programmatic balance in the future, and ensure compliance with NASA Procedural Requirements 7120.5F to accurately reflect cost and schedule baseline commitments, we recommended the Associate Administrator for Science Mission Directorate:

1. Document lessons learned from the APMC Chair's decision to begin Phase C development work prior to formally passing KDP-C and establishing an ABC to the Office of Management and Budget and Congress.
2. Update Dragonfly's project plan to reflect baseline commitments.
3. Ensure SMD maintains adequate levels of UFE to support the Dragonfly project through Phase D.
4. If DCMA determines that APL's EVM data is not sufficiently reliable, ensure APL timely implements any recommendations needed to bring the EVM System into compliance.
5. Ensure the science community is informed of updates to the expected scope and cadence for future New Frontiers missions.

We provided a draft of this report to NASA management who concurred with our recommendations and described planned actions to address them. We consider management's comments responsive; therefore, the recommendations are resolved and will be closed upon completion and verification of the proposed corrective actions.

Management's comments are reproduced in Appendix B. Technical comments provided by management and revisions to address them have been incorporated as appropriate.

If you have questions about this report or wish to comment on the quality or usefulness of this report, contact Laurence Hawkins, Financial Oversight and Audit Quality Director, at 202-358-1543 or laurence.b.hawkins@nasa.gov.

Robert H. Steinau
NASA OIG Senior Official

APPENDIX A: SCOPE AND METHODOLOGY

We performed this audit from August 2024 through July 2025 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The scope of this audit included assessing NASA's management of the Dragonfly project relative to cost, schedule, risk, and technical performance. Specifically, we initially determined whether (1) the project had effective cost and schedule plans in place and if they were performing according to those plans, (2) if the project had adequately considered all available acquisition approaches and were effectively monitoring contractor performance, and (3) whether the project had an effective risk management process in place, including those associated with key partners and development and delivery of the radioisotope power system.

Our assessment included a review of NASA and APL project documents. Examples include the Dragonfly project plan, international agreements, acquisition planning documentation, monthly status reports, KDP-C Decision Memorandums, APMC presentations, and budget information. Additionally, we interviewed NASA officials from SMD, PSD, the PMPO, the Office of the Chief Financial Officer, and the Radioisotope Power Systems Program Office, as well as Marshall Space Flight Center procurement officials and APL project management officials.

Finally, we reviewed federal and NASA criteria, policies, procedures, and supporting documentation; prior audit reports; external reviews; and other documents related to project management. The documents we reviewed included, but were not limited to, the following:

- NASA Procedural Requirements 7120.5F, *NASA Space Flight Program and Project Management Requirements w/Change 4* (August 3, 2021)
- NASA Procedural Requirements 8000.4C, *Agency Risk Management Procedural Requirements* (April 19, 2022)
- NASA PMP-PLAN-001, *Planetary Mission Program Plan w/Change 1* (December 18, 2015)
- Goddard Procedural Requirements 7120.7B, *Funded Schedule Margin and Budget Margin for Flight Projects* (September 17, 2018)

Assessment of Data Reliability

The findings and conclusions of this report do not rely on computer-generated data.

Review of Internal Controls

We assessed internal controls and compliance with laws and regulations necessary to satisfy the audit's objectives per the Government Accountability Office's *Standards for Internal Control in the Federal*

Government.[33] Specifically, we assessed NASA's compliance with internal operating procedures and plans, space flight program and project management requirements, and risk management guidance. We identified internal control weaknesses with Dragonfly's mission funding profile, delays in project development, phasing of UFE, and increases to project cost. However, because our audit was limited to the scope to meet our objectives, it may not have disclosed all internal control deficiencies that may have existed at the time of this audit. Internal control weaknesses were identified and discussed in this report. Our recommendations, if implemented, will improve those identified weaknesses.

Prior Coverage

During the last 5 years, the NASA Office of Inspector General issued four reports of significant relevance to the subject of this report. Reports can be accessed at https://oig.nasa.gov/audits/.

Audit of NASA's Commercial Lunar Payload Services Initiative (IG-24-013, June 6, 2024)

Audit of the Mars Sample Return Program (IG-24-008, February 28, 2024)

NASA's Management of Its Radioisotope Power Systems Program (IG-23-010, March 20, 2023)

NASA's Management of Its Johns Hopkins University Applied Physics Laboratory Portfolio (IG-22-017, September 29, 2022)

[33] Government Accountability Office, *Standards for Internal Control in the Federal Government* (GAO-14-704G, September 10, 2014).

APPENDIX B: MANAGEMENT'S COMMENTS

National Aeronautics and Space Administration

Mary W. Jackson NASA Headquarters
Washington, DC 20546-0001

Reply to Attn of: Science Mission Directorate

TO: Acting Assistant Inspector General for Audits

FROM: Acting Deputy Associate Administrator for Science Mission Directorate

SUBJECT: Agency Response to OIG Draft Report, "NASA's Management of the Dragonfly Project" (A-24-13-00-SARD)

The National Aeronautics and Space Administration (NASA) appreciates the opportunity to review and comment on the Office of Inspector General (OIG) draft report entitled, "NASA's Management of the Dragonfly Project" (A-24-13-00-SARD), dated July 30, 2025.

In this draft report, the OIG found that Dragonfly has experienced cost increases and schedule delays primarily due to NASA directing Johns Hopkins University Applied Physics Laboratory (APL) to conduct four replans in response to issues including the COVID-19 pandemic, supply chain issues, and projected funding challenges. OIG also found that NASA allowed Dragonfly development to proceed under non-optimal circumstances, including NASA's decision to allow Dragonfly to proceed with Phase C development work prior to passing Key Decision Point C (KDP-C).

The OIG makes five recommendations addressed to the Associate Administrator for Science Mission Directorate (SMD) to, among other things, build upon the effectiveness of NASA project management and increase the likelihood of mission success within the established cost and schedule commitment.

Specifically, the OIG recommends the following:

Recommendation 1: Document lessons learned from the Agency Program Management Council (APMC) Chair's decision to begin Phase C development work prior to formally passing KDP-C and establishing an Agency Baseline Commitment (ABC) to the Office of Management and Budget and Congress.

Management's Response: NASA concurs with this recommendation and will document lessons learned.

Estimated Completion Date: January 31, 2026.

Recommendation 2: Update Dragonfly's project plan to reflect baseline commitments.

> **Management's Response:** NASA concurs with this recommendation. NASA is in the process of updating Dragonfly's project plan following Critical Design Review and will ensure that the updated plan reflects baseline commitments.
>
> **Estimated Completion Date:** October 31, 2025.

Recommendation 3: Ensure SMD maintains adequate levels of Unallocated Future Expenses (UFE) to support the Dragonfly project through Phase D.

> **Management's Response:** NASA concurs with this recommendation. NASA will work to maintain sufficient UFE across the Dragonfly mission in accordance with its confirmed baselines and commitments and will assess by the end of the fiscal year whether adjustments may be necessary. If additional project funds are requested in future years, NASA will follow its standard process to assess the necessity and propriety of releasing Mission Directorate-held UFE.
>
> **Estimated Completion Date:** November 30, 2025.

Recommendation 4: If Defense Contract Management Agency (DCMA) determines that APL's Earned Value Management (EVM) data is not sufficiently reliable, ensure APL timely implements any recommendations needed to bring the EVM System (EVMS) into compliance.

> **Management's Response:** NASA concurs with the spirit of this recommendation. NASA, which is the cognizant Federal agency for APL's EVMS, will review the results of the DCMA independent assessment currently expected in September 2025. SMD will coordinate with the Office of the Chief Financial Officer (OCFO) regarding the DCMA findings. Upon review, APL will develop proposed corrective action plans (CAPs) to address any associated corrective action requests. NASA OCFO will coordinate with DCMA to secure their review and acceptance of the proposed CAPs.
>
> **Estimated Completion Date:** January 31, 2026.

Recommendation 5: Ensure the science community is informed of updates to the expected scope and cadence for future New Frontiers missions.

> **Management's Response:** NASA concurs with this recommendation. NASA will keep the scientific research community apprised of revisions to the expected scope and cadence for future New Frontiers missions.
>
> **Estimated Completion Date:** March 31, 2026.

We have reviewed the draft report for information that should not be publicly released. As a result of this review, we have not identified any information that should not be publicly released.

Once again, thank you for the opportunity to review and comment on the subject draft report. If you have any questions or require additional information regarding this response, please contact Luc Riesbeck at (202) 957-9022 or luc.h.riesbeck@nasa.gov.

Nicola Fox
Digitally signed by Nicola Fox
Date: 2025.09.04 09:39:35 -04'00'

Dr. Mark Clampin

cc:
Chief Financial Officer/Mr. Shinn (Acting)

APPENDIX C: REPORT DISTRIBUTION

National Aeronautics and Space Administration

Acting Administrator
Associate Administrator
Chief of Staff
Associate Administrator for Science Mission Directorate
Planetary Science Division Director

Non-NASA Organizations and Individuals

Office of Management and Budget
    Deputy Associate Director, Energy, Science, and Water Division

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Congressional Committees and Subcommittees, Chair and Ranking Member

Senate Committee on Appropriations
    Subcommittee on Commerce, Justice, Science, and Related Agencies

Senate Committee on Commerce, Science, and Transportation
    Subcommittee on Aviation, Space, and Innovation
    Subcommittee on Science, Manufacturing, and Competitiveness

Senate Committee on Homeland Security and Governmental Affairs

House Committee on Appropriations
    Subcommittee on Commerce, Justice, Science, and Related Agencies

House Committee on Oversight and Government Reform
    Subcommittee on Government Operations

House Committee on Science, Space, and Technology
    Subcommittee on Investigations and Oversight
    Subcommittee on Research and Technology
    Subcommittee on Space and Aeronautics

(Assignment No. A-24-13-00-SARD)