SWIFTLY: PROGRAMMATIC INNOVATIONS AND LESSONS FOR NASA'S IN-ORBIT SERVICING FUTURE

Advancing technologies and pathways for satellite maintenance and servicing

WHY DID WE DO SWIFTLY?

THE SWIFTLY MISSION WAS A RARE NO-LOSE OPPORTUNITY WITH THREE KEY MOTIVATIONS

1 – Demonstrate How to Take Smart Risk, and Move Quickly When Necessary

- Unique procurement strategy
- Servicing as a Service
- Streamlining Development Policy

2 – Exercise Working with Commercial Aerospace Industry

- Shared Risk Acceptance
- NASA SME Engagement
- Stakeholder Communications Alignment

3 – Attempt to Extend Swift's Science Lifetime

- Orbital Lifetime Calculation Refinement
- Innovative Drag-Reduction Methods
-Practice of Future Joint Operations Paradigm

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DOING HARD, NEW THINGS QUICKLY REQUIRES ACCEPTING RISK

SHIFTING AN OPERATIONAL PARADIGM RARELY OCCURS INSTANTANEOUSLY

Falcon 1 Test-Learn-Redesign

Falcon 1's early flights taught valuable lessons, paving the way for later successes.

Falcon 9 Reusability Breakthrough

Falcon 9 achieved routine booster recovery with ground and droneship landings through innovation and iteration.

NASA’s SwiftLY Servicing Mission

SwiftLY is NASA’s pioneering commercial, robotic, in-orbit servicing of a legacy satellite, advancing robotic operations.

Building Foundations for NASA’s Operating and Future Missions

Lessons from the SwiftLY mission will shape policies and practices for faster, repeatable on-orbit servicing.



DEMONSTRATE HOW TO TAKE SMART RISK AND MOVE QUICKLY

PROGRAMMATIC INNOVATIONS DEVELOPED FOR A 12-MONTH TIMELINE

Tailored Governance Framework

Governance was tailored under NPR 7120.8 to provide flexibility and right-size project management for rapid timelines.

Pre-Agreed Reviews and Delegation

Pre-agreed tailored reviews and delegated decision authority clarified roles and enabled faster decision velocity.

Use of Soft Gates

Soft gates allowed work and funding to continue during reviews, maintaining progress without delays or loss of discipline.

Sustained Transparency and Oversight

Maintaining transparency on actions and closures ensured alignment with NASA governance while speeding project cycles.

SwiftLY Program Risks

- Is there any mechanism to get a company on contract in time to do this?
- Are there any companies on a SBIR with relevant capabilities to do this?
- Are any of the companies with the capability willing/able to do this?
- Does the cost make sense?
- Is there a launch vehicle available that can get to 21° inclination in time?
- Does the cost make sense?
- Can NASA finalize a contract in time for company to commit to project?
- Can Kwajalein launch be scheduled/reserved on time?
- Can viable grapple location be determined for Swift docking?
- Will Pegasus refurbishment/testing be complete in time for June launch
- Will Swift's orbit prediction remain compatible with boost timeline
- Will Link servicing vehicle be complete in time for June launch
- Launch success
- Link initial commissioning success
- Swift-Link Boost success

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EXERCISE WORKING WITH COMMERCIAL AEROSPACE INDUSTRY

EXTREME TRANSPARENT COMMUNICATIONS AND RAPID SUPPORT AND RESPONSE

Service-Based Acquisition Model

SwiftLY used SBIR Phase III to contract outcome-based services instead of NASA-owned hardware, enabling expediency.

Industry-Led Execution Supported Through NASA Subject Matter Expertise

Industry managed procurement, integration, launch, and operations. NASA supported the industry team through open SME access (APD, RTMD, DAAP, SSMO, NESC).

Accelerated Mission Timeline

This approach compressed project timeline to under a year and simplified procurement for novel technology while providing decades of subject matter expertise where it mattered most.











ATTEMPTING THE SWIFT BOOST SPURRED INNOVATION THAT INFORMS FUTURE MISSIONS





Innovative Operation of a Current NASA Mission

New tools helped to refine orbital lifetime models, orbital drag calculations, and joint operations scenarios

Streamlined Programmatic Governance

Establishing early tailored governance and tracking progress visibly prevented delays and ensured alignment.

Real-Time Situational Awareness

Use of real-time updates on test status and mission parameters for all teams enabled rapid resolution of development challenges

Service-Based Acquisition

Use service-based contracting to let industry manage integration and operations, focusing oversight on key assets.

Empowered Rapid Decisions

Enable rapid decision authority and redesign paths to respond quickly to anomalies within hours.

ATTEMPTING THE SWIFT BOOST SPURRED INNOVATION THAT INFORMS FUTURE MISSIONS

BUILDING A TRANSPARENCY AND PACE RHYTHM WITH INDUSTRY

Real-Time Situational Awareness

Use of a procurement-sensitive dashboard enabled real-time updates on test status and mission parameters for all teams.

Coordinated Communication

Pre-reviewed interim updates ensured external communications aligned with on-orbit realities preserving technical credibility.

Morale and Recognition

Individualized appreciation letters and logistics coordination reinforced a united team ethos during high-pressure tasks.

Partnership Cadence

Daily syncs and inclusive technical reviews created a rhythm balancing startup speed with disciplined decision-making.