

NASA Abandons Multibillion-Dollar Satellite Servicing Demonstration Mission

Description



[Enlarge](#) / A graphic depiction of the OSAM-1 spacecraft (lowermost) connecting with the Landsat 7 satellite (at the top) while in orbital transit.

NASA

In a noticeable shift of strategy, NASA has officially terminated the OSAM-1 mission – a ground-breaking endeavor that intended to exemplify robotic satellite servicing technology, which ambitions, however, had been intensely floundering amidst escalating costs and persistent procrastination. The closure comes on the heels of a cumulative expenditure of close to \$1.5 billion on the project which, if pursued further, could have potentially drained an additional billion dollars so as to facilitate its eventual launch.

Designed with the objective of grapping an elderly Landsat satellite in orbit to successfully refuel, the OSAM-1 mission (an acronym for On-orbit Servicing, Assembly, and Manufacturing), was further expected to demonstrate the potentials of an operative robotic limb in outer space to construct an antenna. Though the construction of the spacecraft for the ambitious mission is in partial completion, NASA declared a cancellation of the project subsequent to an all-encompassing, unaffiliated project review.

The abrupt cancellation of the project was chiefly attributed to sustained technical glitches, budgeting conundrums, and escalating schedule pressures that impinged on the mission's viability.

Project Surfeit

OSAM-1 mission's remit had grown exorbitantly ever since the commencement of the mission. The primary premise centered predominantly around a fueling demonstration. Nevertheless, the project's ambit extended excessively in 2020 when mission administrators appended the objective of in-orbit assembly. This supplementary proviso entailed the introduction of an intricate device termed the Space Infrastructure Dexterous Robot (SPIDER) - fundamentally a 5-meter-length robotic appendage aimed to assemble seven structural modules toward a sole Ka-band communications antenna.

This additional incorporation of SPIDER implied the mission's eventual launch with a total of three robotic arms, inclusive of two additional appendages to hook onto the Landsat 7 satellite in orbit for the fueling exhibit. The profound evolution in the breadth of the mission led to its nomenclature metamorphosing from Restore-L to OSAM-1.

A [report by NASA's Inspector General](#) put forth last year, shed light on the evident procrastination along with cost overruns that plagued the mission. Ever since its inauguration in 2016, NASA plea for financial assistance to Congress amounted to roughly \$808 million for both Restore-L and OSAM-1. Congress pitched in, furnishing NASA with an overwhelming \$1.5 billion for the development of the mission- an astronomical sum that overshoots what NASA had initially intended to secure.

Interestingly, the now-terminated venture - in both its incarnations as Restore-L and OSAM-1 - had systematically enjoyed the patronage of Congress. NASA's Goddard Space Flight Center in Maryland precisely managed the mission. The former Senator Barbara Mikulski who was a renowned protagonist of NASA missions emanating from Goddard, including the now-famous James Webb Space Telescope, was instrumental in sufficing NASA's financing requisition for Restore-L in 2015.

NASA had once confidently predicted that cost of the Restore-L venture will oscillate between \$626 million and \$753 million, harbouring the expectation of readiness for launch in the latter half of 2020. However, this envisioned trajectory failed to materialize as the mission was repetitively beleaguered with recurrent delays and escalating expenses. The recent public schedule showed OSAM-1's launch date deferred till 2026.

A couple of years back, the formally reconstituted OSAM-1 mission was backed with a transfigured budget layout by NASA - a staggering sum amounting to \$1.78 billion dedicated to the design, construction, launch, and operation. As per an independent audit board constituted by NASA last year to scrutinize the viability of the project, it was estimated that the project's overall expenditure could skyrocket to a colossal \$2.35 billion.

Factors external to NASA - namely, the evolution of satellite servicing market - also influenced the



mission's termination. An array of companies are coming up with their own versions of commercial satellite servicing technologies and the spotlight within the satellite industry seems to have altered from refueling unprepared spacecraft (the very purpose OSAM-1 was conceived for) to devising innovative techniques for prolonging the operational life of satellites.

For instance, Northrop Grumman has conceptualized the Mission Extension Vehicle which can connect to a satellite, offering operative maneuverability without the necessity of having to intrude the host spacecraft for refueling. Other industry players are journeying down the path of crafting satellites that are equipped with refueling ports from the get-go. The US military for one is known to be eager to establish fuel depots and tankers in orbit to facilitate their satellites to persistently move and burn propellant, freeing them of the anxiety of fuel exhaustion.

Vocabulary List:

1. **Terminated** // (verb): To bring to an end.
2. **Ambitions** // (noun): Strong desires to achieve something.
3. **Floundering** // (adjective): Struggling or experiencing difficulty.
4. **Expenditure** // (noun): The action of spending funds.
5. **Viability** // (noun): Capability of working successfully.
6. **Metamorphosing** // (verb): Undergoing a change in form or nature.

Vocabulary quizzes

Multiple Choice (Select the Correct answer for each question.)

1. What term describes objects related to outer space or the heavens?
Option: Astronomical
Option: Supernatural
Option: Terrestrial
Option: Molecular
2. Which term describes something involving or causing great damage or suffering?
Option: Miraculous
Option: Benevolent
Option: Catastrophic
Option: Fortuitous
3. Which term describes strong desires to achieve something or reach a goal?
Option: Indifference



- Option: Resignation
- Option: Contentment
- Option: Ambitions

4. What term refers to the capability of working successfully or being effective?

- Option: Imperative
- Option: Unreliable
- Option: Viability
- Option: Incapacitated

5. What term means involving something as a necessary part or consequence?

- Option: Omitting
- Option: Disregarding
- Option: Neglecting
- Option: Entailing

6. Which term means attractive or tempting especially in a provocative way?

- Option: Repulsive
- Option: Gorgeous
- Option: Intriguing
- Option: Enticing

7. Which term describes something likely to develop positively or successfully?

- Option: Diminishing
- Option: Doubtful
- Option: Misguided
- Option: Promising

8. Which term means strong and healthy; vigorous?

- Option: Fragile
- Option: Robust
- Option: Delicate
- Option: Frail

9. What term refers to the extreme scale seriousness or extent of something perceived as bad or morally wrong?

- Option: Smallness
- Option: Triviality
- Option: Enormity
- Option: Moderation

10. Which term describes cautiousness and wisdom in handling practical matters?

- Option: Foolishness



- Option: Rashness
Option: Impulsiveness
Option: Prudence

Gap-Fill (Fill in the blanks with the correct word from the vocabulary list.)

11. The caterpillar was _____ into a butterfly.
12. The sunrise _____ the sky with beautiful hues of orange and pink.
13. The treasure was hidden deep within the _____ of the ancient ruins.
14. The young entrepreneur had a _____ future ahead in the tech industry.
15. The new _____ exhibition at the museum attracted visitors from far and wide.
16. His contract was _____ prematurely due to breach of company policies.
17. The company was _____ in the competitive market unable to find a niche.
18. Students need to _____ in the course before the semester begins.
19. The medicine had a _____ effect on alleviating the patient's pain.
20. Launching a successful business will _____ a significant amount of hard work.

Matching Sentences (Match each definition to the correct word from the vocabulary list.)

21. Some ancient cultures believed that the movements of the stars and planets were guided by forces.
22. study the universe its celestial bodies and the phenomena that occur in space.
23. focus on understanding the fundamental principles that govern matter energy space and time.
24. The national debt reached over one dollars a staggering amount.
25. The novel had an plot that captivated readers until the very end.
26. The artist was for her innovative sculptures that challenged traditional art forms.
27. is the scientific study of prehistoric life through the examination of fossils.



28. As a wine she could discern the subtlest flavors and aromas in different vintages.

29. The tsunami caused damage to the coastal town leaving devastation in its wake.

30. The of the issue became clear as more people voiced their concerns.

Answer

Multiple Choice: 1. Astronomical 2. Catastrophic 3. Ambitions 4. Viability 5. Entailing 6. Enticing 7. Promising 8. Robust 9. Enormity 10. Prudence

Gap-Fill: 11. metamorphosing 12. suffused 13. recesses 14. promising 15. museographical 16. terminated 17. floundering 18. enrol 19. potent 20. entail

Matching sentence: 1. celestial 2. astronomers 3. physicists 4. trillion 5. enthralling 6. renowned 7. paleontology 8. connoisseur 9. catastrophic 10. salience

CATEGORY

1. Sci/Tech - LEVEL6

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