Cygnus™ OA-4 Mission
Cargo Delivery Spacecraft for the International Space Station (ISS)

Overview
For the OA-4 mission, Orbital ATK has developed an enhanced space system for improved cargo delivery capability to the International Space Station (ISS). Cargo capability has increased to better than 3500 kg (7700 lbs) on this mission vs previous maximum capability of 2300 kg (5070 lbs).

The Cygnus spacecraft is a flight proven system, having successfully delivered cargo to the ISS on three previous missions. Cygnus is used to carry crew supplies, spare equipment and scientific experiments to the ISS. The OA-4 Cygnus vehicle consists of an upgraded service module and an enhanced pressurized cargo module.

The upgraded service module utilizes flight proven avionics and communication systems, and incorporates new UltraFlex™ solar arrays as well as an optimized propulsion system and structure.

The Enhanced Pressurized Cargo Module is based on the standard PCM, developed by Thales Alenia Space for the Cygnus spacecraft. The Enhanced PCM has increased volume capability by approximately 25%, as well as an improved secondary structure allowing for more densely packed cargo.

The OA-4 mission is the first Cygnus mission utilizing the Atlas V launch system, providing increased performance and flexibility to the Orbital ATK cargo delivery service. This mission is also the first Cygnus mission to utilize the Kennedy Space Center and launch from the Cape Canaveral Air Force base in Cape Canaveral, Florida.

FACTS AT A GLANCE

Mission Partners
Orbital ATK
Prime contractor; engineering and development; Cygnus Service Module, mission and cargo operations

Thales Alenia Space
Pressurized cargo module

Mitsubishi Electric Corporation (MELCO)
Proximity link system

Draper Laboratory
Guidance, navigation and fault tolerant computer support

United Launch Alliance
Atlas V 401 launch vehicle delivery service

JAMSS America, Inc.
Operations support

Kennedy Space Center
Spacecraft processing facilities and services
**Specifications**

**Mission Overview**
- **Space Vehicle:** Cygnus
- **Launch Vehicle:** ATLAS V 401
- **Cygnus Launch Mass:** 7,492 kg
- **Propellant Mass:** 828 kg
- **Ascent Cargo Mass:** 3,513 kg
- **Descent Cargo Mass:** Up to 3,513 kg
- **Mission Duration:** 4 days ascent & phasing up to 60 days berthed, 2 days descent & reentry

**Pressurized Cargo Module**
- **Height:** 5.1 m
- **Diameter:** 3.05 m
- **Heritage:** Multi-Purpose Logistics Module
- **Total Cargo Mass:** 3,513 kg
- **Pressurized Volume:** 27 m³
- **Berthing at ISS:** Common Berthing Mechanism (CBM), Node-1 nadir or Node-2 nadir

**Service Module**
- **Heritage:** GEOStar, LEOStar
- **Height:** 1.29 m
- **Max Diameter:** 3.23 m
- **Power Generation:** 2 fixed wing *UltraFlex™* solar arrays, ZTJ Gallium Arsenide cells
- **Power Output:** 3.5 kW (sun-pointed)
- **Propulsion:** 32 x 7 lbf REA, 1 x 100 lbf DVE
- **Propellant:** Dual-mode N₂H₄/MON-3 or N₂H₄

**Mission Profile**
- **NASA cargo loaded in Cygnus Pressurized Cargo Module**
- **Launch from Kennedy Space Center**
- **Rendezvous and berthing with ISS**
- **Destructive reentry above the Pacific Ocean**

**Key Contacts**

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