

OA-5 Mission

Cargo Delivery for the International Space Station (ISS)

FACT SHEET



Overview

The OA-5 mission is the sixth mission undertaken by Orbital ATK to deliver crew supplies, spare equipment and scientific experiments to the International Space station under the NASA Cargo Resupply Service-1 (CRS-1) contract. For the CRS-1 contract Orbital ATK will deliver approximately 28,700 kilograms of cargo to the ISS, and dispose of ISS waste.

Cargo is delivered to the station using Orbital ATK's Cygnus spacecraft. The Cygnus spacecraft consists of two modules: the Service Module (SM) which incorporates the avionics, propulsion and power systems from Orbital ATK's flight proven LEOStar and GEOStar spacecraft buses; and the Pressurized Cargo Module (PCM) which carries the crew supplies, spares and scientific experiments. The SM is integrated and tested at Orbital ATK's Dulles, Virginia satellite manufacturing facility. The PCM is supplied by Thales Alenia Space and is produced in Turin Italy.

Cygnus will be launched into orbit using Orbital ATK's upgraded Antares 230 launch vehicle from Virginia Space's Mid-Atlantic Regional Spaceport Pad 0A on Wallops Island, Virginia at NASA's Wallops Flight Facility. The Antares 230 vehicle features all new RD-181 engines which provide increased performance and flexibility to the Orbital ATK cargo delivery service.

After being launched into low-Earth orbit, the Cygnus spacecraft will use its substantial maneuvering capability to transport the cargo from a low parking orbit to the ISS where it will be grappled by the ISS crew using the station's robotic arm and berthed to the station. After the cargo is removed and any ISS disposal items are added, Cygnus will depart from the ISS, and begin secondary payload missions.

For the OA-5 mission Cygnus will carry the Saffire II payload experiment to study combustion behavior in microgravity. Data from this experiment will be downloaded via telemetry. In addition, a NanoRack deployer will release Spire Cubesats used for weather forecasting. These secondary payload operations will be conducted after Cygnus departs the ISS.

FACTS AT A GLANCE

Launch Vehicle: Antares 230

Cargo Spacecraft: Enhanced Cygnus Ascent Cargo Mass: 2400 kg Descent Cargo Mass: Up to 3200 kg Launch Site: MARS Pad 0A, Wallops Island, VA Mission Duration: Up to 75 days



Cygnus Spacecraft

Pressurized Cargo Module



Cygnus Launch Mass:	6,163 kg	Turning
Propellant Mass:	800 kg	
Ascent Cargo Mass:	2,400 kg	
Pressurized Volume:	27m ³	
Height:	6.39 m	
Power Generation:	2 fixed wing "UltraFlex ^T ZTJ Gallium Arsenide o	^M " solar arrays, cells
Descent Cargo Mass:	Up to 3,200 kg	
Mission Duration:	4 days ascent & phasir up to 60 days berthed Up to 2 weeks descen	ng t & reentry

Antares Launch Vehicle

- Diameter: 3.9 m
- Height: 42.5 m
- Mass: 290,000 310,000 kg

Stage 2 -

 Orbital ATK CASTOR® 30XL solid motor (CASTOR 120 Heritage) with thrust vectoring

Stage 1 -

- Liquid oxygen/kerosene fueled
- Orbital ATK responsible for system development and integration
- Core tank design and design verification by KB Yuzhnoye (Zenit-derived heritage)
- Core tank production by Yuzhmash
- Two Energomash RD-181 engines each with independent thrust vectoring

Cygnus Advanced Maneuvering Spacecraft



Destructive reentry into Earth's atmosphere at the end of mission

Mission Profile



Cargo is delivered to Wallops Flight Facility and loaded into Cygnus



Cygnus is launched into orbit by Antares from MARS Pad 0A at Wallops Island, VA



Cygnus rendezvous with the ISS and is grappled and berthed by the ISS crew



