NG-14 Mission
Delivering Cargo to the International Space Station

Launch Profile

1. Stage One Ignition
   - Time: 0 sec
   - Orbit Altitude: 0 km (0 mi.)

2. Lift Off
   - Time: 3.7 sec
   - Orbit Altitude: 0 km (0 mi.)

3. Main Engine Cut-Off (MECO)
   - Time: 3 min 18 sec
   - Orbit Altitude: 83.9 km (52.1 mi.)

4. Stage One Separation
   - Time: 3 min 24 sec
   - Orbit Altitude: 88.9 km (55.2 mi.)

5. Fairing Separation
   - Time: 3 min 54 sec
   - Orbit Altitude: 111 km (68.9 mi.)

6. Interstage Separation
   - Time: 3 min 59 sec
   - Orbit Altitude: 114 km (70.8 mi.)

7. Stage Two Ignition
   - Time: 4 min 7 sec
   - Orbit Altitude: 118 km (73.3 mi.)

8. Stage Two Burnout/Orbit Insertion
   - Time: 6 min 52 sec
   - Orbit Altitude: 178.3 km (110.8 mi.)

9. Payload Separation
   - Time: 8 min 52 sec
   - Orbit Altitude: 178.1 km (110.6 mi.)

Mission Parameters

Launch Vehicle:
Antares 230+

Cargo Spacecraft:
Cygnus

Launch Site:
MARS Pad 0A, Wallops Island, Virginia

Ascent Cargo Mass:
Approx. 3,400 kg (7,500 lb.)

Descent Cargo Mass:
Up to 3,700 kg (8,100 lb.)

Initial Orbit Altitude:
171 km x 295 km

Inclination:
51.63°

Transit to Station:
Two Days

Duration at Station:
Up to 90 Days Berthed
Up to two weeks on orbit

*not drawn to scale
Mission Description

For the NG-14 mission, the Cygnus spacecraft will deliver approximately 3,629 kg (8,000 lb.) of cargo to the space station. Cygnus is comprised of two primary components, the Pressurized Cargo Module and the Service Module. In keeping with company tradition, each spacecraft is named after an important figure in the aerospace industry. Northrop Grumman is honored to name the NG-14 Cygnus spacecraft after the first woman of Indian descent to fly in space, Kalpana Chawla. The S.S. Kalpana Chawla will be launched into orbit using an Antares 230+ rocket from Virginia Space’s Mid-Atlantic Regional Spaceport (MARS) Pad 0A on Wallops Island, Virginia. Northrop Grumman will once again load critical cargo into Cygnus, 24 hours before the scheduled launch.

Upon arrival at the International Space Station, the cargo will be unloaded from Cygnus. For the fifth time, Cygnus will host the Spacecraft Fire Experiment – V (Saffire-V) experiment to study the behavior of large-scale fires in microgravity that will be performed once the spacecraft departs the station. The mission will also carry Northrop Grumman’s SharkSat payload, an internally developed prototype supporting on-orbit technology demonstrations. Utilizing a streamlined development approach, SharkSat will allow engineers to evaluate emerging technologies in the space environment. SharkSat is driving rapid innovation in technology development processes and building Northrop Grumman’s next generation of engineering leaders. Once its mission has been completed, Cygnus will perform a safe, destructive reentry into Earth’s atmosphere over the Pacific Ocean.

Cygnus Spacecraft

Pressurized Cargo Module
Service Module

Cygnus Launch Mass:
8,050 kg (17,700 lb.)
Propellant Mass:
800 kg (1,764 lb.)
Ascent Cargo Mass:
Approx. 3,400 kg (7,500 lb.)
Pressurized Volume:
27 m³
Height:
6.39 m (21 ft.)
Power Generation:
2 fixed wing UltraFlex™ solar arrays, ZTJ gallium arsenide cells
Descent Cargo Mass:
Up to 3,700 kg (8,100 lb.)

Antares Launch Vehicle

Diameter:
3.9 m (12.8 ft.)
Height:
42.5 m (139.4 ft.)
Mass:
290,000 - 310,000 kg (639,341 - 683,433 lb.)

Stage 2
Northrop Grumman
CASTOR® 30XL solid motor with thrust vectoring

Stage 1
Liquid oxygen/kerosene fueled
Northrop Grumman responsible for system development and integration
Core tank designed and verified by KB Yuzhnoye (Zenit-derived heritage)
Core tank production by Yuzhmash
Two Energomash RD-181 engines each with independent thrust vectoring

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