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How Deploying Your Satellite from the International Space Station Brings Value to Your Organization

Contact info@nanoracks.com for satellite inquiries.

Value Proposition

Commercial Satellite deployment from the International Space Station (ISS), offered by Nanoracks, has proven to be an effective and reliable launch strategy. As of the end of 2020, Nanoracks has deployed more than 200 satellites from the ISS, with manifests continuing to fill up for future missions.

NewSpace companies and academia build their technology differently from the traditional space industry by adapting to agile development paradigms. Business models, technical specifications, and funding are typically not finalized up front, but rather through iterative investment and development. These companies and institutions are thus pressured to show incremental progress and proof-of-concept in order to raise funding for next cycle of their development.

The growth of lower-cost small satellite launch services is leading to a preference and trend for quick evaluation In Orbit Demonstrations (IOD), in favor of the traditional and less conclusive ground-based R&D.

The pressure of stage gate funding and the resolve of IOD is however, pushing technology development toward a more risk tolerant ethos. Developers cannot afford to lose pace, need to adhere to tight schedules, and must deliver tangible results at critical milestones. In effect pushing the envelope of rapid development whilst achieving mission success rates. A difficult act to balance.

IOD has many advantages and appeal, however it does come with some inherent drawbacks and risks with the launch service. Tight schedules commonly lead to slippage meaning large penalties to move to a later flight or with fewer less convenient follow-on options, and a volume approach to mass market small satellite launch can mean a harder touch approach with a less finessed ride, or the spacecraft equivalent of a *cattle class* ticket.

What the NewSpace player needs more than anything is a reliable, flexible launch service with high touch delivery on-orbit success, all at an affordable price.

Nanoracks Satellite Deployment from the International Space Station offers exactly that.



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Deploying satellites from the ISS, compared to a traditional Rideshare launch has a number of unique features:

Highly reliable launch: to the ISS are proven to be very reliable with multiple types of launch vehicles and a steady and predictable schedule. No prime satellite customer that will delay the launch indefinitely or unforeseen technical risks that come with other unproven/low-cost launcher systems.

Flexible launch window: If development of the spacecraft slips, then the decision to fly the with degraded mission parameters is often the only choice that can be made in contrast to losing the launch. Nanoracks, however, can manifest on all commercial resupply missions (CRS) to the ISS. This means that the customer can choose between 4-5 launch windows per year and shift this for a comparatively low-cost up to L-120 days. Even as late as after L-120 days, Nanoracks has the ability to re-manifest the spacecraft and get you into space within a few months following, pending cargo availability and launch schedule.

Very short turn around on re-flight: If a mission fails or an organization needs to make technical adjustments to prove a business case, fast re-flights are essential. With only minor changes to the spacecraft, Nanoracks is able to re-manifest the mission and get you into space within a 6-month window.

Soft stowed, pressurized, ambient temperature at launch: CubeSats are integrated into the Nanoracks CubeSat Deployer (NRCSD) at Nanoracks' facilities in Houston, Texas. The deployers are bubble wrapped and placed in Cargo Transport Bags in the pressurized capsule with other equipment and supplies bound for the ISS. The spacecraft will not be exposed to the same magnitude of shock, vibration and depressurization as a traditional rideshare mission. This type of launch lowers risk and increases development speed by downscaling the required amount of ground testing.

Well defined orbit: ISS orbit covers 85% of Earth's populated areas. The ISS has a very well-defined orbit which means that orbital injection parameters are very accurate and delivered early, helping the mission management during Launch and Early Operation Phase (LEOP). Nanoracks has representatives on console during deployment who will communicate directly to our customers.

High quality video stream from deployment: Satellite deployment from the ISS can be video streamed real-time in high quality compared to traditional ride-share. This is a great help for mission management during LEOP as visual feedback on the spacecraft tumbling rate, and of course also a great feature if customers want to throw a launch party for their team, customers, investors and other stakeholders. Nanoracks is often able to coordinate for the ISS crew to take high resolution photos during satellite deployment.

Space debris mitigation: ISS altitude of approximately 400km provides about a one-to-one-and-a-half-year orbital lifetime. This is highly sufficient for most IOD missions, but also means that we are reducing orbital debris and satellites de-orbit naturally. This is a



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very cost-effective feature since the spacecraft design do not need to include active de-orbit sub-systems.

Launch from US: Nanoracks typically manifest payloads to SpaceX Falcon 9/Dragon and Northrop Grumman Antares/Cygnus. Nanoracks can arrange access to launch viewing for visitors, a major exciting bonus for the customer, investors, families, and friends.

Student and university projects: Nanoracks have enabled hundreds of student projects, including microgravity research and CubeSats, to be launched to the ISS. Students were some of Nanoracks first customers and remain a strong force today. The ISS brings a unique opportunity to inspire students to understand the wonders of space by designing, building, and launching a real experiment that will fly to the ISS. The fast turnaround from concept to flight that the ISS provides also allows students to complete research in one academic year, an issue that student organizations have run into in the past with students graduating before a project was complete. Nanoracks truly enjoys the enthusiasm of students and has become masterful at guiding the launch of student projects to space successfully.

Price: Competitive to traditional rideshare launch incorporating all the above additional value adds.