

Service description

**Satellite project: Launch service for four 3U
CubeSats in formation**

Award No.: OV-238-26

Client:

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1 BRIEF DESCRIPTION OF THE SERVICE

As part of the in-orbit demonstration mission RACCOON IOD (**Robust And seCure post quantum COmmunication fOr critical iNfrastructure**), the Technical University of Berlin (TU Berlin, hereinafter referred to as the client – AG) intends to procure a partial service for the realization of the project.

During the project period, four small satellites (3U cubesats, 3 flight models (FMs), 1 flight spare (FS)) will be developed, built and launched into low Earth orbit.

The aim of the RACCOON IOD mission is to triangulate radio signals in orbit by means of a formation of four cubesats. The prerequisite for this is that the satellites are brought together and with defined, reproducible release conditions into a common orbital plane.

In order to achieve the project objectives, a launch service for four satellites in 3U CubeSat format including the provision of the deployment system and support for integration will be put out to tender.

The project is divided into two phases:

Phase 1 runs from 16.11.2026-28.02.2027.

The optional phase 2 is then to start from 01.03.2027, if the phase has been approved by the funding body. The launch of the satellites is planned for 2028.

1.1 PROJECT PHASES AND RESERVATION OF FUNDING APPROVAL

The project of the AG is divided into two phases. The Contractor must provide the following services:

- **Phase 1 (until 28.02.2027):** Reservation and contractual securing of the launch site, mission and orbit analysis, supply of the Interface Control Document (ICD), coordination of the deployment strategy.

Optional service for the AG - subject to the approval of funds

- **Phase 2 (from 01.03.2027):** Production and provision of the deployer, fit check, integration campaign, launch campaign, start and suspension as well as verification.

The commissioning of the services described in phase 2 is subject to the approval of the funds required for this purpose by the contracting authority's funding provider. A decision on the approval of the funds is expected in the first quarter of 2027.

The services of phase 2 are agreed as optional services. The Contractor has no claim to call up the optional services.

The Client shall inform the Contractor in text form by 28.02.2027 at the latest whether the services of Phase 2 will be called up. The call-off shall be expressly made by the Client.

If there is no call-off of phase 2 by 28.02.2027, the bindingly commissioned services of phase 1 will remain. For the uncalled services of phase 2, the contractor will not be entitled to remuneration, compensation or other payment claims.

The prices and other contractual conditions offered for Phase 2 shall be binding on the Contractor until the expiry of the scheduled call-off period.

1.2 MILESTONE PLAN

Phase 1:

- **M1 – Launch reservation confirmed:** When placing the order and signing the contract
- **M2 – Confirmation of phase 2 by the AG:** 28.02.2027 at the latest

Phase 2:

- **M3 – Kick-Off Meeting Phase 2:** Expected March 2027
- **M4 – Handover of the ICD:** Expected 12 months before the start date
- **M5 – Handover of Test Deployer:** Expected 9 months before start date
- **M6 – Completion of the integration campaign:** Expected 1-2 months before the start date

1.3 PAYMENT METHODS

Payments are based on the following milestones:

Phase 1:

- 100% of the total contract value for Phase 1 (OV-238-26 price sheet, item 1) after performance M1 (reservation of the starting place, includes reservation fees and service of the Contractor)

Optional Phase 2:

- 30% of the total contract value of Phase 2 (OV-238-26 Price Sheet, Item 2) upon completion of Milestone 3
- 25% of the total contract value of Phase 2 (OV-238-26 Price Sheet, Position 2) upon completion of Milestone 4
- 25% of the total contract value of Phase 2 (OV-238-26 Price Sheet, Position 2) upon completion of Milestone 5
- 20% of the total contract value of Phase 2 (OV-238-26 price sheet, position 2) at completion of milestone 6

The remuneration is in each case plus the statutory value added tax.

1.4 MAXIMUM PRIZE PHASE 1

The maximum price for phase 1 is EUR 166,600.00 gross/ EUR 140,000.00 net and is binding for all bidders/bidding consortia. This means that bidders/bidding consortia who submit a higher bid price will be excluded from the further procedure.

The maximum price must already include/calculate any additional services that may be subject to a fee. Claims beyond the offer cannot be asserted against TU Berlin.

2 SERVICE DESCRIPTION

Below are the minimum criteria (MK) with the required components and parameters of the services to be procured.

2.1 LAUNCH SERVICE FOR FOUR 3U CUBE SATS IN FORMATION

Below are the minimum performance requirements.

2.1.1 Background and objective

The subject of this service is the provision of a launch service for four satellites in the 3U CubeSat format of the RACCOON IOD mission, including the provision of the deployment system, support for integration and the execution of the launch and release into the target orbit.

The scientific objective of the mission requires that all four satellites are released into the same orbital plane and altitude and that the release conditions between the four launch sites are as equal as possible. Deviations in the release speed, the rotation rate and the release time determine the subsequent relative drift of the satellites and thus directly the achievable quality of the formation. The contractor must advise the AG on how to realize a formation after ejection.

The deployer is provided by the contractor. The satellites are developed, built and tested by the AG and handed over to the contractor for integration.

2.1.2 Service description

2.1.2.1 SCOPE OF SERVICES

The Contractor (Contractor) shall perform the following for the Client (Client):

- Supply and contractual securing of a launch site for four satellites in 3U CubeSat format
- Supply of the deployer system with four deployment slots

- Advice (in German or English) on the release of the satellite formation with regard to influence on the ejection direction, sequence and time
- Mission and orbit analysis including proof of compliance with target orbit parameters
- Interface Control Document (ICD) for Deployers and Launchers
- Support for the mechanical and electrical integration of the satellites into the deployer, including fit check
- Implementation of the launch and launch campaign
- Verification of release times, state vectors and achieved orbital parameters
- Execution of the export and customs clearance to the launch site. The costs are carried by the Contractor, which must be included in the offer
- Supply of CAD data and a test pod (EM/EQM of the deployment system) for accuracy of fit and acceptance tests
- Check-out campaign at the launch site including obtaining the necessary permits. The costs are carried by the Contractor, which must be included in the offer.

2.1.2.2 REQUIREMENTS

The requirements are divided into mandatory and target criteria. Mandatory criteria (Must) must be complied with. Bidders who do not meet them will be excluded from the evaluation. Target criteria (should) are desired and can be discussed after the contract has been awarded.

ID	Requirement
LS-01	The satellites must be launched into Low Earth Orbit (LEO).
LS-02	The satellites must be launched into a polar or sun-synchronous orbit (SSO).
LS-03	The launch configuration must support the deployment of four satellites with a common launch launcher.
LS-04	The deployer system must provide four deployment slots for CubeSat satellites in 3U format.
LS-05	It must be evaluated together with the working group whether one or more deployers are needed for the deployment of the four satellites in formation. The result must be implemented.
LS-06	The nominal orbital altitude of the satellites must be between 500-600 km.
LS-07	The start is scheduled for summer (July to September) 2028. If this is not possible, other launches must be offered and coordinated with the AG.
LS-08	The start date should be able to be postponed once seven months before the original start free of charge.
LS-09	The deployer system must be provided by the contractor (AN) and must be compatible with the CubeSat Design Specification for the 3U format.
LS-10	The deviation of the spring forces and the resulting launching velocities between the four launching stations must be less than 5%.
LS-11	The mechanical environmental conditions occurring during launch and ascent (quasi-static loads, sine and random oscillations, shock) as well as the pressure drop and temperature profile must be fully specified in the ICD.

LS-12	The contractor must support the AG in the mechanical and electrical integration of the satellites into the deployer and accompany the integration.
LS-13	The Contractor must enable the participation of at least two employees of the AG in the integration campaign in order to carry out the integration of the satellites in the deployer.
LS-14	The Contractor must take over or organise the transport of the satellites from the Client to the integration (at the Contractor) or launch location, including transport insurance and customs clearance. The costs for this are to be included in the offer.
LS-15	The Contractor must confirm the deployment of each satellite and transmit the deployment time (UTC) and the state vector at the time of deployment to the AG.
LS-16	The launch carrier used must have proven flight experience: at least 15 successful launches of the same with a success rate of at least 90%.
LS-17	The launching system must be qualified for use on the intended launch carrier.
LS-18	The Contractor must provide CAD data of the deployment system in a neutral exchange format (at least a STEP file) for a computer-aided fit check.
LS-19	The Contractor must provide the Client with a test deployer that is suitable for accommodating the satellites for mechanical fit testing as well as for acceptance and environmental tests. This shall be done no later than six months before the launch date.
LS-20	A fit check of the satellites in the deployment system must take place. This should be possible at the latest three months before the flight models are handed over.
LS-21	The contractor must communicate the final requirements for the environmental test campaign (including test and acceptance levels for vibration, shock, thermal vacuum). This should be done in a binding version at least nine months before the start.
LS-22	The exact handover date of the four flight models must be bindingly agreed with the AG at least six months before the start date.
LS-23	If necessary, access to the satellites at the launch site must be guaranteed. This includes, among other things, charging the batteries and replacing critical components in the event of a fault. Depending on the scope of the service work, this can be done by the Contractor or must be made possible for the employees of the AG.
LS-24	The Contractor must take care of the return transport of the previously shipped check-out material and ground support equipment to TU Berlin, including customs clearance and freight costs.
LS-25	Transport insurance must be taken out for all transports of satellites and ground support equipment. The insurance sum must be stated in the offer.
LS-26	The contractor must provide the expected orbit data. This should be done at least one week before the start.
LS-27	The Contractor must provide a post-launch report for each satellite. This should be done no later than 24 hours after launch.
LS-28	The bidder must have successfully completed at least 10 launch campaigns as a launch broker or launch service provider. Proof is provided by references (see point 5) with the offer.
LS-29	Russian launch sites, launch systems and supplies are excluded. The Contractor must ensure compliance with the applicable EU sanctions and foreign trade regulations.
LS-30	The Contractor must provide a named personal contact person (Mission Manager) who can be reached by phone and e-mail and will get back to you within two working days at the latest.
LS-31	The technical support of the Contractor must be available until the start and beyond until the return of the ground support equipment to TU Berlin.
LS-32	The Contractor must obtain all start-related licenses, approvals and permits for the deployed launch carrier.

LS-33	The Contractor must advise and support the AG in the implementation of the formation of the satellites. This includes, among other things, the realization of the same exit directions and speeds, influence on the separation sequence and estimation of the drift after the release of the satellites.
LS-34	The AN should have previous experience with the deployment of formations (2 or more satellites).

3 PLACE OF PERFORMANCE

3.1 PICK-UP LOCATION AT THE AG

Technical University of Berlin
Marchstraße 12-14
10587 Berlin

3.2 LOCATION OF THE INTEGRATION LABORATORY OF THE AN

The place of performance INTEGRATION LABORATORY OF THE CONTRACTOR is located on the premises of the Contractor. The specific place of performance must be bindingly communicated to the Client when submitting the offer.

3.3 SATELLITE LAUNCH AS A PLACE OF PERFORMANCE

The place of performance SATELLITE LAUNCH is located in external premises. The specific place of performance must be bindingly communicated to the Client when submitting the offer.

First, the satellites are transported by the Client to the Contractor's integration laboratory (point 3.2), for the purpose of integrating the satellites into the container before transport to the actual place of performance, the launch site (point 3.3). The costs for this, including all ancillary costs and transport, including the risks of delivery, are borne by the Contractor. These are to be stated in the OV-238-26 price sheet at the appropriate place.

The launch site (point 3.3) is freely selectable by the contractor as long as all the 2.1.2.2 are met.

The satellites will then be delivered by the Contractor to the SATELLITE LAUNCH location. The transport to one of the launch sites, including the assumption of all costs incurred during the transport (export, customs, insurance), as well as the risks of delivery, shall be borne by the Contractor.

The exact delivery date of the satellites to the integration laboratory must be agreed by the contractor with the client at least 6 months in advance.

4 DATES / EXECUTION TIMES

Phase 1:

Start of execution: Execution can take place from the day the contract is awarded (presumably 16.11.2026).

End of execution: The end of execution is the reservation of the starting place, no later than 30.11.2026.

Phase 2:

Start of execution: Execution will start with the kick-off meeting in phase 2 (milestone 3), which is expected to take place in March 2027 if commissioned.

End of execution: The end of the execution is the launch of the satellites, the handover of the post-launch report and the return of the check-out materials to TU Berlin, probably Q3-Q4 2028.

The agreed delivery deadlines are binding. Delays in delivery and performance must be reported to TU Berlin immediately. This applies if, due to significant and unforeseeable circumstances of political and/or economic proportions, there are supply bottlenecks or disruptions in the supply chains that are not within the Contractor's area of responsibility. With the prompt notification of this to TU Berlin, the expected delivery times at this time must be communicated.

5 DOCUMENTS TO BE SUBMITTED

The following documents must be submitted with the offer. If the following points are not presented in writing, the offer will be excluded:

- **TUB - Offer letter from the bidder:** Please submit this document completed with the offer.
- **TUB - Price sheet (ZK¹):** Please submit this completed document with the offer.
- **Wirt declarations (EK):²** Please submit these documents completed with the offer:

¹ ZK = Award criterion

² EK = Suitability Criterion

- Wirt-124
- Wirt-2141
- If applicable:
 - Wirt-235
 - Wirt-236
 - Wirt-238

- **Specification documents (EK):** The bidder submits the following documents:
 - Requirements matrix with information on whether the respective requirements can be met
 - Deployer System Document
 - Mission and launch description with planned launch windows
 - Self-declaration that the launch carrier used meets LS-16.
- **Reference (EK):** At least one reference must be attached in each case stating that the bidder:
 - Has successfully completed at least 10 launch campaigns
 - the launch carrier used has proven flight experience: at least 15 successful launches of the same with a success rate of at least 90%.

with comparable models within the last 10 years.

The reference must contain the following information:

company/institution, contact person, contact details, scope of service

The bidder agrees that TU Berlin may contact the specified contact persons within the framework of this call for proposals.

- **Business liability insurance (EK):** The bidder must confirm in the form of a self-declaration that a valid business liability insurance with a minimum coverage of 1 million euros for personal injury and property damage and 500,000 euros for financial losses is available for each claim or that the sums insured will be adjusted at the latest at the beginning of the contract. The contracting authority reserves the right to request appropriate evidence in the course of awarding the contract.
- **Indication of place of performance (EK):** The bidder must specify the location of the integration laboratory and the location of the starting site.
- **Transport insurance (EK):** The bidder must confirm in the form of a self-declaration that there is valid transport insurance for the integration and starting site. Business liability insurance with a minimum coverage of EUR 1 million for personal injury and property damage and EUR 500,000 for financial loss is available per claim or the sums insured are adjusted at the latest at the beginning of the contract. The Client reserves the right to request appropriate evidence in the course of awarding the contract.

- **Flexibility start date (EK):** The bidder must state in the form of a self-declaration whether the start date can be postponed free of charge once seven months before the original start. The conditions applicable to this and any other requirements must be stated in full.

6 AWARD CRITERION AND WEIGHTING

Taking into account all the circumstances, the contract will be awarded to the most economical bid, including phase 1 and phase 2. The evaluation will be based on the bid submitted. Therefore, it is in the interest of the bidder to provide all requested information as detailed and correct as possible.

The award criterion is 100.00% of the total net bid price.