

## Responsive Launch Mission Planning Tool

**Code:** 20/41

**Company:** KISPE Space System Limited

**Location:** Farnborough

### **Company Description:**

KISPE was established in 2016 as a programme and systems engineering company working in the electronics, telecommunications and space sectors. The goal of the company is to work with its customers on the execution or implementation of their business ideas, from the early inception and business planning activities, through the design, manufacture, integration, test and operations. In addition to the programme and systems engineering activities, the company is also active in the generation and delivery of specialist training and development and the provision of consultancy services.

KISPE's vision is to advance the responsible and sustainable use and utilisation of space and to stimulate the development of space-based applications and services. The company strives to find innovative engineering, programmatic and business solutions to address challenging programme requirements, drawing on significant experience in the design, development and operation of space systems, and leveraging cutting edge and disruptive technologies and techniques developed in other fields.

The KISPE team have significant small-satellite engineering and launch-related experience, having been responsible for the design, development, manufacture, launch and operation of over 50 satellite programmes, working with launch providers around the world for delivery of the missions to orbit.

KISPE are involved in a number of spaceport and launch-related activities within the UK, supporting Virgin Orbit and Spaceport Cornwall in establishing Horizontal launch from Cornwall Airport Newquay in 2021/2022 and working with MOOG on the development and UK manufacture of the Orbital Manoeuvring Vehicle.

### **Project Description:**

Through the work with Virgin Orbit and Spaceport Cornwall, KISPE have identified the need for a unified responsive launch mission planning tool. A tool that can be used from the initial mission capture stage, mission planning, trajectory design, guidance navigation and control parameter derivation, payload accommodation and integration, through to launch. While COTS based tools exist that provide some of the functionality, they do not provide the level of integration needed to support the responsive launch operations requirement. The development of a specific tool would therefore be beneficial.

The objective of this project is to begin the development of one element of the mission planning tool, specifically the trajectory design and overflight analysis functions. These functions have been selected as a starting point, as they can be used to support some of the ongoing Spaceport Cornwall mission analysis work.

The work will entail:

1. Capture and agreement of the requirements for the trajectory design and overflight analysis functions.
2. Identification of baseline mission reference scenarios, that will be used in the development, testing and as examples.
3. Development of the trajectory design and analysis functions.
4. Testing of the trajectory design and analysis functions against other algorithms and tools.
5. Development of the overflight analysis functions.
6. Testing and validation of the overflight analysis functions.
7. Development of reference mission scenarios, assuming Spaceport Cornwall operations.

The output of this project will feed into the wider Responsive Launch Mission Planning Tool development activity.

### **Applicant Specification:**

KISPE are looking for candidates that are enthusiastic, inquisitive, motivated, and self-starting to come and join our team for the summer. The company blends the knowledge and experience of a highly skilled team who have designed, build and operated many satellite missions, with a small company environment, a collaborative and disruptive ethos, and a desire to stimulate the utility and application of space, and to do things differently.

Assuming lockdown restrictions are relaxed prior to commencement of the internship, the work placement will be at the KISPE facilities in Farnborough, Hampshire. Alternatively, this project may be achieved while observing lockdown restrictions, employing a range of appropriate remote working tools and applications.

### **Minimum Requirements:**

The candidate must

- Be a UK passport holder\*
- Be older than 18\*
- Be a quick learner, curious and creative
- Be able to work independently and as part of a team
- Be open to new challenges

- Have knowledge of aerospace or aeronautic engineering
- Have knowledge of programming and simulation software

(\* Site access requirement)

**Preferred Additional Requirements:**

To be undertaking further education in the following disciplines: Engineering, Computer Science, Physics / Maths or similar

Have experience in suitable programming languages and modelling tools such as C, C++, Python, Java, MATLAB, STK.

**Further details:**

8 weeks minimum fixed term contract to be agreed with successful candidate but nominally with a start date around 20<sup>th</sup> July 2020 to attend the SPIN Induction day at the Satellite Applications Catapult, and completion before 20<sup>th</sup> September for the Showcase the following week. Salary is £1,500 per calendar month gross.

**Closing Date for Applications: 5pm Thursday 9 July**

Applications should be made through the online form attaching a CV, before the closing date. Please note that elements of the form left incomplete will be deemed to render the application ineligible. They will be checked for eligibility and forwarded to the employer.