insight

sh gillamor stephens
CONSULTING, TECHNOLOGY & SERVICES

HOW PRESTWICK SPACEPORT IS QUIETLY POSITIONING ITSELF TO LEAD UK LAUNCH AMBITIONS

Mick O'Connor

As the UK's small satellite spaceflight capability comes online, potential market growth will be limited only by our imagination and determination.

**By Mick O'Connor CEng, CDir,
Programme Director, Prestwick Spaceport**

Some people question how many spaceports the UK can sustain. However, if the UK can offer a reliable, responsive, and affordable small satellite launch capability, then the world will beat a path to our door.

In this article, I explore some of the potential challenges that lie ahead. I'll also set out why Prestwick Spaceport is well-placed to lead the UK's future spaceflight ambitions, as well as the many potential benefits we offer to investors, partners, and local economy 'beyond launch'.

How many spaceports can the UK sustain?

Across the UK, six spaceports aim to become operational in 2022, with Prestwick aiming to be ready for first orbital launch in late 2023. The plan is for all of us to be able to launch small satellites into 'low Earth orbit' – though our ambition at Prestwick goes even further.

> **The real challenge is about competitiveness and growing the market in Europe and beyond.**

While there are questions around whether the UK will be able to sustain so many spaceports, the real challenge is about competitiveness and growing the market in Europe and beyond. In many ways, the global market is still immature, but demand for launching satellites – and the data they provide – is growing fast and is currently outstripping supply. Therefore, as the small satellite spaceflight industry starts catching up with demand and launch options appear in Europe for the first time in history, the market can start to find its feet.

With this rising demand, if the UK can offer a world leading capability for delivering payloads into space, then satellite owners and operators will come to us. Likewise, if we are not responsive and safe, or amongst the most sustainable and affordable, then the market will go elsewhere. This is partly where regulation plays a part.

The regulatory challenge

While technical challenges remain for Prestwick and other spaceports, one major potential hurdle ahead is regulation. No one can launch without a licence, and no one can get a licence without the regulator granting them one. At present, the spaceflight regulatory framework is not in place.

At the time of writing, the regulation is passing through the UK parliament. While we anticipate this will have been passed by the end of the summer, we will then have a new regulator having to interpret a new piece of legislation. Like anything new, this comes with a learning curve, both for the regulator and for us in the industry.

Even in a best-case scenario, spaceports will not begin to submit licence applications until August or September this year and, depending on complexity, it could take anywhere from nine to eighteen months until an application is granted. In other words, any small delay in submitting applications means spaceports may possibly not receive licences to launch until 2023.

> **Any small delay in submitting applications means spaceports may possibly not receive licences to launch until 2023.**

For us at Prestwick, the fact we have announced our intention to launch in 2023 shouldn't mean our application gets put to the back of the queue, provided we submit all of the relevant documentation in plenty of time. This is something our team is working together with the Civil Aviation Authority to ensure.

Prestwick's unique launch capability

There are many aspects to the development of Prestwick Spaceport that make us unique, starting with our launch technology. The other UK spaceports – except for Cornwall – will launch rockets using vertical launch technology from fixed points.

At Prestwick, we will be employing horizontal launch technology. That is, we use a carrier aircraft that takes off from a runway carrying a rocket. Once the plane is airborne and far from Prestwick, the launch vehicle releases, ignites, and autonomously heads into space from an ideal position anywhere in the world depending on the desired orbit and inclination.

> **We would have the technical capability to have multiple launches in a single day if the market required it, which is pretty unique – not just in Scotland or the UK, but anywhere in the world.**

Because of the launch solution we will be using, we are not constrained by limited carrier aircraft availability, which gives us a level of in-built redundancy. It also means that we would have the technical capability to have multiple launches in a single day if the market required it, which is pretty unique – not just in Scotland or the UK, but anywhere in the world.

This is one reason why we're seeing interest from well-known satellite companies in the industry who are excited by the idea of multiple launches. At the same time, our launch vehicle technology is currently in development in the US and is a variant of an already demonstrated capability, immediately putting Prestwick in a strong and less risky position.

Our development timeline indicates that we will be ready for first operational launch in the last quarter of 2023, after we thoroughly and carefully achieve each milestone. At that stage, we will have the capability

to launch small satellites with payloads of up to 800kg from anywhere in the world. The conversations we are having with satellite operators around the world, have been favourable, so for planning purposes we are looking at a cadence of around one launch per month, from the second year of operation.

The other thing we are looking into – though this is still at the concept stage – is the potential for a crewed spaceflight from Prestwick. When I mention it, people usually give me a funny look, but this is something we have been researching for some time and currently liaising with the Civil Aviation Authority on noise contours.

With human space flight capability, we would be able to replenish the international space station and other space stations as they come online. Certainly, we expect the replenishment of food, provisions, and people to and from space stations to become more in demand in the decades ahead and we feel that this is an area that should be explored in detail rather than dismissed out of hand.

The crewed spaceflight solution would also be able to recover and re-orbit satellites, as well as allowing in-space experimentation, manufacture, and construction. This is an area that is likely to grow, so we are planning for it now – and so far, we are the only European spaceport doing so.

> **“The other thing we are looking into is the potential for a crewed spaceflight from Prestwick.”**

> **“We are having several interesting conversations with companies who are investigating the benefits of investing and locating here.”**

Prestwick’s unique skillset and heritage

With lofty ambitions like these, you need to have strong foundations. This is the other area where Prestwick really stands out, and what is likely to make us the leading UK spaceport in the years ahead.

Companies such as BAE Systems, Collins Aerospace, GE, Woodward, Spirit Aerosystems, and others, are already based here at the Prestwick. They bring a wealth of talent and skills in aerospace and aviation all in one ecosystem. The spaceport is building on this strong heritage of innovation, engineering expertise, and a reputation as a leading European aerospace hub.

After a period of flying “under the radar”, it is this heritage that we are building our marketing around at the moment and why our new brand tagline is “Beyond Launch”. Prestwick Spaceport is a catalyst to stimulate economic activity around space. Not only are we planning for space launch capability for 2023, but we are also building the commercial infrastructure to support it, as well as manufacturing and significant supply chain capability, all of which will build on Prestwick’s established history within aerospace and aviation.

The idea is to stimulate inward investment from across the UK and further afield. So far, results are encouraging, and we are having several interesting conversations with companies who are investigating the benefits of investing and locating here.

The recently signed £250m Ayrshire Growth Deal, of which £80m is dedicated to aerospace, including space, activity, will provide the funding to sustain and grow such activity, positioning Prestwick as Europe's leading space hub. We are also looking to establish an application centre to assist companies develop their technology and overcome the challenges of transitioning through TRL 5 to 9.

With all of these projects, Prestwick would be uniquely positioned as its own self-contained 'spacetech' cluster, covering everything from technology development to design, manufacture, and launch, as well as having the future potential to put humans in space as well. It is all very exciting, and we have support from the UK government, the Scottish government, and the local councils as demonstrated by the Growth Deal.

Safe, affordable, and responsive access to space

The space industry is in an exciting place right now, particularly in Scotland. But, as I indicated earlier, there is competition from across Europe and the rest of the world. If our plans – both across the UK, Scotland and here in Prestwick – come to fruition, then we can become one of the world's fastest growing spacetech hubs, attracting the best talent, the best companies, and the most exciting research and development. We have the ambition, the rail, road, sea and air infrastructure, the history, the appetite, and the expertise to do so.

> **"There is competition from across Europe and the rest of the world… we must not rest on our laurels."**

However, we must not rest on our laurels. Other countries are seeking to develop their own space industries and several European nations are also in the race to provide reliable, responsive, and affordable launch capability. In the years ahead, the focus of the industry in the UK must remain:

- **Are we safest?**
- **Are we affordable?**
- **Are we responsive?**
- **Are we sustainable?**

The signs are positive, the will is here. All we need is to stay focused and respond to the needs of the market, and our dreams for the future of the Scottish space sector can come true. We are only constrained by our imagination; 'dare to dream'.