

POTENTIAL UK WITHDRAWAL FROM EUROPEAN UNION MEMBERSHIP ("BREXIT")

Policy and Regulatory Considerations for the Space Sector

A Joint Programme of ISPL and UCL

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LONDON INSTITUTE OF SPACE POLICY AND LAW



REPORT

This Workshop was jointly organised by ISPL and UCL, and was held on Thursday 23 March 2017. Topics of relevance were outlined by specialists in the relevant fields and discussed under Chatham House Rules by invited delegates from all sectors of space operation and regulation. We would like to thank UCL's Institute of Education for hosting the event.

The Rapporteurs were Professor Alan Smith and Dr Ian Scott.

WITHDRAWAL PROCESS AND EFFECT

INTRODUCED BY PROFESSOR PIET EECKHOUT

The withdrawal process was described although much uncertainty exists. A single agreement could include both the terms of the withdrawal and a description of the future relationship. It is also possible that trade agreement negotiations would only occur after a final withdrawal.

Trade negotiation will take a lot longer than 2 years, and there is currently no real sense of what the transition will look like. In principle this could involve some continued membership but this might be politically very difficult to achieve, especially in relation to the European Union Court of Justice. The negotiation of the transition arrangements would have to be relatively comprehensive and may be as complex as the final relationship. Therefore negotiating such a transition might be pointless.

Many contracts between UK entities and other EU entities rely on the enforceability of decisions in one EU jurisdiction in another, as provided by the Brussels Regulations that form part of EU regulations. Under the Brussels Regulations, any judicial decision in London on a commercial contract is accepted throughout the EU. If these regulations and the jurisdiction of the ECJ were to be removed from English law, it would have an impact on the relationships already formed. A recent report in Parliament included the recommendation

that the Brussels Regulations should continue to apply in the UK. Therefore, the transition is a matter of concern. It will not be possible to remove the authority of the ECJ over the UK while retaining the underlying laws and regulations that are to be interpreted by the ECJ. The Great Repeal Bill is a misnomer. It is not about repeal at all, as the Government has stated that it will incorporate EU laws currently applied in the UK into English Law. Some of the laws could stand alone, for example environmental law, but much of the EU law is concerned with cross-border relationships, such as common standards that facilitate the single market. There is more EU law that relates to these relationships than there is concerning other matters. It makes little sense to incorporate such laws into English Law unless an agreement has been reached with the EU to secure it will also apply those laws to the UK.

There are also institutional changes that need to be made to accommodate adoption of EU laws that increasingly make use of certain agencies with regulatory powers. The UK will need to establish agencies that can perform those functions, or agree with the EU terms that allow use of the EU regulatory agencies.

Regarding a trade agreement and leaving the customs union, the UK government has suggested scope for a sectorial approach. However this focus on trade issues leaves to one side more systemic issues such as recognition and enforcement of judgments, environmental legislation, free movement of persons that is not merely about immigration but has an economic dimension relating to access to expertise, etc. Why should the EU be disposed to give to the UK the opportunity to select the sectors that it is most interested in? The EU is based on the premise that all members are involved in everything, not just the things they see as most beneficial. Why should the sectorial approach only be given to the UK and not to other nations?

It is unlikely that the EU will depart from its fundamental principles. The single market is predicated on uniform application of all the rules throughout the market. In existing trade relationships the EU has insisted that the trading partner respect its laws and regulations. For example, it has required the US to protect data relating to EU persons on the same terms as those that apply in the EU.

A legal objection to the sectorial approach is that the WTO customs union rules require their application to substantially all the trade between the members of the WTO customs union.

The current EU Customs Union of which the UK is a part allows movement of goods within the EU free of any customs formalities or duties. As soon as a product enters any Member State, the harmonised customs regulations allow the goods to be treated as if they were European products and allow their free circulation within the EU. This can work because of the EU's single external trade policy. This does not mean that after Brexit there can be no free trade arrangement between the UK and the EU, but of necessity rules of origin will need to apply between the two.

For the space sector, where components cross borders perhaps several times before they become finished products, this would mean repeated checks at customs borders to determine the origin of the relevant items. This would create bureaucratic processes and delays in supply chains. The rules of origin, particularly those applied to the origin of finished products, are a battle ground in trade negotiations, as commercial interests are involved. It was noted that there are specific rules applied to ‘dual use’ products that are often present in space systems.

The easiest thing would be to extend the period of withdrawal, or move into the EEA group, providing a framework. Note that EU law is not supreme under EEA rules.

EU regulations only apply in Member States at the EU level. On leaving the EU, they will no longer apply to the UK. The UK will have to construct its own regulations and structures needed to implement them.

Negotiations are complicated by the plethora of agendas involved, including those of the Commission, the Council, the EU Parliament and 27 Member States.

RESEARCH AND DEVELOPMENT FUNDING INTRODUCED BY PROFESSOR GRAEME REID

Eighteen percent of EU funds coming to the UK are for R&D - second only to Agriculture. The Scientific Academic community favoured remaining in the EU (by about 85% to 90%) and sees great benefit in close ties with Europe. EU membership provides access to a much wider talent pool in the competitive world of science and a relative ease of forming collaborations. Therefore it is a significant part of the Brexit agenda. It is also a pervasive one, because scientific expertise underpins agreements on international trade and many of the regulatory responsibilities would transfer from the EU to the UK. As well as being a budget factor, it is also understood as ‘code’ for much of the technical expertise that will be part of the Brexit process and part of the UK's changing relationship with the wider world.

In relation to EU structural funds and their benefit for UK Science, it was noted that across the board the UK is a net contributor to the EU, while within the science domain the UK is a net recipient. Less than five percent of UK support for science comes from the EU (about €1.5bn/year) although some sectors, disciplines and institutions have benefited more than others (including, for instance, UCL). The actual patterns are very complicated, and may not be reflected by headline numbers.

In terms of business participation in EU funding, here also headline numbers may be misleading for certain sectors. Overall the UK participates at a lower level than France and Germany in bigger businesses (on the order of UK 20%, France and Germany 30%), but the UK's small business sector has participated more than SMEs in France and Germany. In financial terms it's difficult to imagine damage to UK science as a consequence of Brexit. UK Government statements have reflected support for science funding, and the Autumn Budget Statement announced additional funding for science not as compensation for loss of EU funds, which is yet to be discussed. The announced increase more than compensates for the loss of EU funding, although it may be differently distributed. In overall financial terms Brexit is therefore unlikely to be damaging to science in a financial sense.

It has to be noted, though, that the health of the UK science sector involves much more than funding. The bigger issue is people, especially the free flow of talented people, including EU nationals. There is awareness in government of a need to provide substantive reassurance for UK nationals living in other EU countries and *vice versa*. There is also a recognition that the UK is in a competition for talent, and needs to go out and find it.

Science interacts with other aspects of the UK's relationship with Europe. For instance, science underpins the harmonisation of standards and protocols across the EU. If there is an asymmetry in scientific expertise in trade negotiation teams, the team with less expertise will be at a disadvantage.

Regarding international standards, it was noted that ISO is the main standard body for measurement, but for matters such as food, EU standards dominate. The view was expressed that there is an advantage to formulating laws and regulations in keeping with UK views and experience, as in the case of the Draft Spaceflight Bill, rather than to adopt a European or other model.

In relation to infrastructure and the sharing of large items of equipment or facilities, we may see some of them relocated to central Europe because of current shared ownership and access to markets. However, the main shared infrastructures are in environment and life sciences rather than space.

Regarding funding, it is hard to find evidence of significant funding benefit from EU membership. However there is evidence that funding from Framework Programme 7 (FP7), which we will lose on Brexit, is effective. Two-thirds of investment in research comes from business and one-third from the public sector, a pattern found in other countries. One half of the business investment comes from companies headquartered outside the UK, which is not the case in other countries. The UK is attractive to foreign investors such as AxaNobel, Boeing, and McLaren. The strength of the UK Science base (arguably under threat from Brexit, see above) is a huge determinant of inward investment into the UK generally and UK R&D in particular. The motivation behind the Autumn Budget increase might be to make the UK even more attractive to global investors in R&D, helping prepare for life outside the EU.

It was noted that UCL/MSSL is engaged mainly with ESA (rather than EU) projects, and that the UK's membership of ESA is not currently threatened. However, it was also noted that the EU is a major funder of ESA's optional programme, and so UK involvement in Optional programmes (such as Galileo) may be in jeopardy. It was noted that ESA rarely turns away sources of funding, and that access to national funding is a route to international collaboration.

RELATIONSHIP WITH ESA AND EU PROGRAMMES OF ESA INTRODUCED BY PIERO MESSINA

ESA was created before the EU started thinking about space. In the 60's and early 70's the UK's position was to be outside the EU but within ESA.

ESA now has 22 Member States, 20 of which are also members of the EU. Norway and Switzerland are outside of the EU; the UK will become the third. ESA has cooperation agreements with Canada and with Slovenia (an EU member State that has just become an

Associated State), and cooperation agreements with all other EU States not yet members of ESA, except Croatia.

ESA is an intergovernmental organisation and its main decisions are taken by the Council of Ministers. Currently Jo Johnson represents the UK. In the last five years there have been Council of Ministers meetings ('Ministerials') in 2012, 2014, and 2016 at which budgets and funds are agreed, especially with regard to the Optional Programme and general level of funding. Of €10bn gathered at Lucerne in 2016, €1.5bn came from UK, the fourth largest contributor after Germany, France, and Italy. The UK's main interests were earth observation, telecoms, science, and space exploration (ExoMars and the ISS). The UK is also making space a pillar of its economic development. At Lucerne the UK Minister stated that the government believes space can make a strong contribution to the UK economy, and that it will support projects that can achieve a greater share of the worldwide space market.

ESA maintains some level of presence throughout the world, and has centres in most of the big European countries (France, Germany, the Netherlands, Spain, Italy, Sweden, as well as offices in Belgium.) In the UK ESA's Harwell Campus concentrates on telecoms, integrated applications, science and technology. This reflects the growth in UK participation in ESA programmes. There are 100 people of 22 nationalities working at Harwell, as well as several hundred UK nationals working for ESA at different locations.

ESA is engaged in all fields of space activities in Europe, in Mandatory and Optional programmes. Mandatory Programmes account for one quarter of ESA's budget and are contributed to by Member States according to their respective GDPs. The rest of the budget comes from Optional Programmes in which Member States participate in line with their industrial or research interests. One of the most successful of the Mandatory Programmes is the scientific research programme that costs only €600 million a year. ESA runs some Optional programmes on behalf of the EU. Galileo and Copernicus are EU funded projects within the Optional programmes.

ESA's annual budget is €6bn, a third of which comes from EU programmes, in particular Galileo and Copernicus. The other €4bn comes from the other 22 ESA Member States. The Optional programmes include the Human Space Flight Programme, recently joined by the UK. Others are earth observation (Copernicus), autonomous access to space (European launchers, including Ariane VI), navigation (Galileo) and telecommunication, one of the focuses of ECSAT.

Brexit may have an impact on UK participation in some projects that ESA undertakes for the EU. Currently ESA's Optional Programmes include Galileo and Copernicus, two flagship EU projects:

- Galileo is the navigation programme for which ESA is developing and managing the space segment. 18 satellites are in orbit with 6 more to fly. Initial services have been launched. Galileo provides Open and Public Regulated Service (PRS), devoted to such

areas as public authorities and civil protection. SSTL is part of the consortium and a major contributor to the space sector. The UK will be a full member of the EU when the current batch of satellites is launched, however the next batch (up for bidding in 2019) may be a problem for UK companies. There may also be issues associated with the liability of the UK as a Launching State for the 18 satellites in orbit.

- Copernicus is a global monitoring system primarily for environmental purposes. ESA is the system architect and is developing the space segment (Sentinel satellites). UK access to this system and its market will become problematic after Brexit.
- GovSatCom is a telecommunications programme in the definition phase.

The EU also has its own Space Surveillance and Tracking (SST) programme that is similar to ESA's Space Situation Awareness (SSA) programme. A UK company is part of the SST consortium.

Continued participation by the UK in all of these programmes will be affected by Brexit, and will have to be negotiated with the EU. ESA could provide some assistance, as it does for Norway and Switzerland, but ultimately the role of the UK will have to be negotiated with the EU.

ESA is independent of the EU, even though they have come to work together more closely over recent years. ESA operates on a *juste retour* policy, returning to a Member State about 93% of its contributions to ESA (i.e. members are guaranteed to see this return to their states from ESA contracts), while the EU favours open competition and definitely not *juste retour*.

Discussions about EU-ESA integration have been on-going for some time, and have led to some tension. A framework agreement was negotiated in 2004 that outlines and seeks to regulate working relations between the European Commission and ESA, but it is not well applied at present. It foresees a series of bodies and entities that are not currently very active. The agreement has been extended to 2020.

In October 2016 an attempt was made with strong support by Member States of ESA and the EU to align the space strategies of the EU and ESA into a single strategy. But, as a compromise solution, the EU published its own space strategy with an overarching statement signed by the EU and by ESA to increase cooperation and coordination between the two. There are also a series of agreements in place between ESA and European agencies, such as GSA that is in charge of the operation of the Galileo constellation, and the European Defence Agency. It was noted that procurement regulations of GSA require contractors to have their centre of business in an EU Member State.

Currently the EU contribution to ESA is 30% of the budget. This is already causing tension, and if it grew further, ESA would need to adapt to the interests of its already largest funder.

It was noted that ESA does not seem to be considering the NATO dimension, as it does not appear to want to be seen as a North Atlantic organisation.

The EU is interested in space because it's an enabler of the wider economy and social progress, through applications such as communications and navigation, and as a means of ensuring security of European citizens.

Leaving the EU may affect UK participation in some of ESA's EU programmes. Brexit might also affect the ability of UK nationals to work in ESA centres in Europe (and *vice versa*) even though there are some special arrangements in place. The Foreign Office (FCO) has said that it will limit the number of 'diplomatic status' Europeans working in Harwell ESA centre.

Relations with China and India are important to ESA and there is cooperation between them. ESA wants to expand this, and to maintain good links to these and other nations. There is a diplomatic dimension to these relationships while maintaining cooperation with the US. This is going to become more relevant with the ISS reaching the end of its life and the new Chinese space station just being built.

EU SECURITY SPACE PROGRAMMES

INTRODUCED BY RICHARD BOWDEN

There is a general consensus that space is becoming increasingly important, especially in relation to security. This comprises three main areas: surveillance and intelligence, communications and navigation, plus some focus on weaponisation. Space provides a global footprint and reach, making space technology a major resource and part of a critical infrastructure. For example, space provides the timing that regulates many of our daily activities. There have been huge reductions in the cost of accessing space.

The EU is primarily a civilian organisation, but does have a strong and very important security role, e.g. Frontex, Computer Emergency Response Team. The EU also links more widely, for instance through the Five Eyes organisation that includes Australia and New Zealand.

The EU Defence Agency is primarily a procurement organisation and as yet there is no European Defence Force (EDF). However, the UK is currently the main negative voice regarding formation of EDF, favouring instead NATO, so after Brexit we may see movement towards its creation.

EU space programs with security aspects:

- Galileo, the EGNSS, is the only civilian-owned navigation system. Users of Galileo include the military, and it has a strong security focus.
- EGNSS deals with safety and integrity. EGNSS 3 will have a much greater security aspect.
- Copernicus is a mainly science-based Earth Observation programme but does have security connotations. However, it is not a 'secure system'.
- GovSatComm provides dual-use secure communications for military and other government agencies. In this area the UK has a strong background and technically a lot to offer; there is potential to negotiate a post-Brexit role.

While the UK is a major participant in Galileo security aspects, nevertheless it could lose all rights to use Galileo at Brexit. Currently one of the two security monitoring centres for Galileo is in the UK at Swanwick. Brexit will have an impact on the significant PRS legislation (particularly Decision 1104/2011). In addition, the US has requested permission to participate in PRS and the EU will push for a reciprocal arrangement, possibly in the absence of the UK. (See above regarding the implication of Brexit to our engagement in EU funded ESA's Optional programmes.)

Modern security is a global operation (although the EU seeks system independence), and the relationship of the USA with the rest of the world is a significant factor. The EU needs the UK as much as the UK needs the EU. Collaboration is essential in areas such as space debris. It was noted that much of the UK technology provision into EU funded programmes comes from international companies such as Airbus, and that we should expect to see them rebalance their UK presence accordingly.

ECONOMIC FACTORS AND CONSIDERATIONS INTRODUCED BY PROFESSOR MARIANA MAZZUCATO

The UK sees a renewed focus on industrial and innovation policy. There is a continuing focus on sectors, while the space sector tends to be more naturally mission-oriented. However, the economic benefits derived from investment in mission-oriented activities are difficult to evaluate (valorisation).

The right balance between market-shaping and market-making needs to be found. Business investment, particularly UK R&D, is below the OECD average. It is hard to improve investment by tinkering with interest rates and taxes. The underlying ecosystems can be predator-prey, symbiotic or parasitic – the space sector appears increasingly to be in the last category. A huge part of US R&D is going through brokers, and there are concerns about Risk-Reward (e.g. in space tourism).

Taxes provide the underlying source of government funded R&D, yet the level of taxation today is much lower than in the past. The UK does not have mission-specific long-term finance. We need better metrics of public value since economics should consider 'Public Good' (see for instance funding of the BBC). The long-term value of publicly funded activities needs to be identified and measured. We will need to encourage the private sector to invest rather than 'sit on their money'. Challenges and missions can be used to catalyse new thinking. A UK Industrial Strategy White Paper is expected that is not just about sectors. Space 4.0, ESA's term for the current situation with an increased level of private participation in space projects, is very much mission-driven.

It was noted that security was a challenge that could provide an opportunity to increase skills in the UK. The UK must overcome the sectorial constraints of a 'Green book' approach, and see investments such as that in the Sabre engine as potentially transformative in ways not

restricted to direct returns on investment. Policy makers should seek to raise investment rather than merely raise profits. Governments should provide funding rather than micromanage its use.

It was noted that there was always strong pressure to demonstrate economic return from space science missions. Brexit may make this harder. It was also remarked that the ‘world is currently awash with money looking for a 7% return’ for investment in technology. The science community has to address this more purposefully.

CONCLUDING NOTE

This Workshop identified some of the important factors that need to be considered by the space sector and by Brexit negotiators. Notice under Article 50 has been served by the UK, setting out some of the UK’s positions, but changes could occur following the General Election in June 2017, and much remains to be clarified.

Further joint Workshops will be held by ISPL and UCL as developments occur. Those interested to participate are encouraged to contact [ISPL Events](#).

If you would like to follow up on the issues raised in this report please contact us.

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