EUROPEAN COMMISSION

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In the published version of this decision, some information has been omitted, pursuant to articles 24 and 25 of Council Regulation (EC) No 659/1999 of 22 March 1999 laying down detailed rules for the application of Article 93 of the EC Treaty, concerning non-disclosure of information covered by professional secrecy. The omissions are shown thus […].		PUBLIC VERSION This document is made available for information purposes only.

Subject: **SA.39457 (2015/N) - United Kingdom**
SABRE – Aid to Reaction Engines Limited

Sir,

The Commission wishes to inform you that it has decided to raise no objections to the above mentioned State aid, for the reasons set out below.

1. PROCEDURE

(1) On 3 September 2014, the UK authorities pre-notified the SABRE engine project. On 15 October 2014 the Commission sent by electronic mail a request for information to the UK authorities, asking for several clarifications with respect to the aid to the beneficiary company.

(2) A meeting took place on 21 October 2014 between the Commission services and the UK authorities to discuss the clarifications demanded by the former. On 10 November 2014 the UK authorities submitted the answers to the Commission's inquiries.

The Rt Hon Philip HAMMOND

Secretary of State for Foreign and Commonwealth Affairs
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(3) On 21 January 2015 the UK authorities notified the aid and on 5 February 2015 they completed the information.

(4) On 19 March 2015 and 11 June 2015 the Commission sent a request for information asking for further clarifications, mainly with respect to the impact on competition of the SABRE project.

(5) On respectively 24 April 2015 and 30 June 2015 the UK authorities replied to the Commission's requests for information.

2. THE PROJECT

2.1. Beneficiary company

(6) The beneficiary of the aid is Reaction Engines Limited ("REL"), a medium-sized company established in the UK. The company, currently owned by 251 shareholders, was created in 1989. There is one class of ordinary shares in issue, each with the same voting and participation rights. REL's latest published and independently audited accounts for the Year to 31st December 2013 reflect the following:

- Staff headcount average of 52 (49 at start, 55 at close)
- Annual turnover of GBP 1.2 million (or EUR 1.68 million)[1]
- Annual balance sheet total of GBP 5.6 million (or EUR 7.86 million)[2]

(7) In the light of these figures, the UK authorities have confirmed that REL is a medium-sized enterprise, according to the SME Recommendation.[3] It should be underlined that no enterprise has the right to appoint or remove a majority of the members of the administrative, management or supervisory body of REL (and neither does REL have any such rights over other enterprises). No enterprise has the right to exercise a dominant influence over REL pursuant to a contract entered into with that enterprise or to a provision in its memorandum or articles of association (and neither does REL have any such rights over other enterprises). No enterprise controls alone, pursuant to an agreement with other shareholders in or members of that enterprise, a majority of shareholders' or members' voting rights in REL (and neither does REL have any such rights over other enterprises). None of the shareholders holds more than 25% of REL's shares or more than 25% of its voting rights.

(8) REL has been operating with limited private funding, coming largely from high net worth individuals with keen personal interest in the sector. An employee share scheme was established in autumn 2014 with no aerospace or industry shareholders at that point. Majority of shareholders are UK resident individuals and a few institutional shareholders.

2.2. Technical characteristics of the aided project

(9) REL has invested over 30 years in research into thermodynamics and heat exchanger technology and intends to develop SABRE, an engine which, if successful, is to power a reusable airframe, named SKYLON, for flights into the outer space.

(10) The company is seeking to develop SABRE design, a project which is to be undertaken from April 2015 (or from the clearance of the aid from the Commission) until end of 2017 ("SABRE design project"), and is purportedly unique as it combines a rocket engine with an air-breathing engine within one installation. The SABRE engine will enable hypersonic travel within the

[1] Exchange Rate 1GBP = 1.4 EUR (month June 2015 on the Commission's InforEuro webpage)

[2] See supra footnote 1.

[3] OJ L 124 of 20.5.2003, p. 36

atmosphere at a speed of Mach 5 in air breathing mode (more than twice as fast as any other air-breathing engine) and up to Mach 25 in pure rocket mode. The air-breathing characteristic reduces the amount of liquid oxygen that needs to be carried compared to a conventional rocket engine without the mass penalty of having multiple engine installations. This frees up mass and enables a step change in cargo capacity and/or increased room for more robust airframes, enabling a vehicle to reach orbital velocity and altitude from the Earth's surface without jettisoning any hardware.

(11) SABRE design project concerns the design, engineering and assembling of key engine components, namely an innovative heat exchanger, for integration in a new type of launcher engine and test for the following development phase. In particular, this will involve at least two "world firsts": the assembly of an ultra-lightweight air pre-cooler, rated at hundreds of megawatts, and a helium powered air turbo-compressor. Neither of these unique engine components has ever been built before. The objective of the 2.5 year programme is to de-risk the technology by bringing about a significant improvement to each of the multitude of component parts and subsystems of the complex SABRE system to enable pre-prototype integration into a system level approved design. Once completed an increase in the Technology Readiness Level (TRL) from 4 to 6 will occur.

(12) The key deliverable of the SABRE design project is to reach a successful outcome of the Critical Design Review (CDR) in late 2017 for the SABRE engine and, in doing so, to de-risk the engine design. Essentially, this means that during the project all component parts will be designed, and a programme of model and component testing will be completed together with the development of manufacturing processes to produce such components. In parallel, the design of parts and components will be assessed by the Civil Aviation Authority for certification. This will culminate in approved detailed design blueprints for each of the subsystems, and ultimately at the integrated system level.

(13) If the full SABRE project is successful (i.e. design and production), the engine will be mounted on SKYLON, a newly designed prototype which, once brought to commercial scale production, will significantly reduce the recurring costs typically making up the large proportion of the launch total costs. According to REL, SKYLON will bring launch costs significantly below the current market price.

(14) SKYLON is a vehicle concept prepared by REL to provide a reference point for SABRE engine-related design and development activities. Therefore SABRE is not a launch vehicle but an engine technology that could enable reusable space launch vehicles. The route to market for REL would be via the licensing of the SABRE engine technologies, or potentially developing engines with industrial partners in response to customer requirements.

2.3. Interest for the project among aerospace players and potential partners

(15) The UK Government announced its intention to grant an R&D&I aid to REL in July 2013. Since then, the company has received a general positive interest in future collaboration from […](*)[4] and from several European state bodies […] who wish to participate in the programme.

(16) The above companies combine activities in aviation and space-related projects. Without REL, these companies would not be likely to cooperate in view of the integration of the technology at issue into an innovative non-expendable space launcher because their main focus is upon different technology applications. In addition to the general interest shown by the above

[4] *Confidential information.

mentioned companies, […] which sets out their intention to "*cooperate in studies, development, manufacture and operations of the Skylon vehicle and potential experimental demonstrator vehicles of it*".

2.4. Competition (from outside Europe) and current technological progress

2.4.1. United States

(17) Regulatory restrictions have made it difficult for REL to work with and secure financial assistance from the aerospace industry in […]. […] Moreover, information provided by the UK authorities indicates that the […] has tasked […] to develop a launch vehicle whose propulsion system would be similar to SABRE's.

2.4.2. Japan – HIKARI project

(18) This project, which is a pre-cooled turbojet, could be viewed as a competitor that may move first to market. The engine uses hydrogen both as coolant for pre-cooler and as fuel for combustor, similar technologies to REL's technology. The project is being funded by the METI (Ministry of Economy, Trade and Industry) and other Japanese authorities, which essentially means that they have access to public funds to establish a testing programme

2.4.3. Other developments

(19) Apart from the two projects mentioned above, ongoing research projects are mostly targeted at incremental innovations of current technologies applied to multi stage rockets and based on expendable launchers. None of the existing launchers uses air-breathing engines, such as SABRE, and all of them are expendable. Although the most recent Space X's Grasshopper will be a reusable rocket, this will still rely on expendable launchers which will be jettisoned after take-off. The ongoing R&D&I projects include[5]:

- **Ariane** (EU): it is yet to be decided whether the next vehicle will be an upgrade to Ariane 5 or an entirely new design.
- **Long March** (China): Long March significantly increases payload capacity up to 25.000kg from current maximum of 9.000kg. It is smaller but enables rapid launch within 5-7 days of receiving orders
- **Angara** (Russia): Angara is expected to replace all its current vehicles; the heaviest version, Angara A5, will have a payload capacity of 24.500kg
- **SpaceX's** Falcon Heavy and Grasshopper (USA): the latter is an attempt to develop a completely reusable spaceflight system. The former focuses on the payload, but using a traditional propulsion system.

3. DESCRIPTION OF THE MEASURE

(20) REL needs GBP 120 million for the SABRE design project, of which GBP 50 million will be R&D&I aid in the form of a grant, while GBP 60 million will be provided by private investors. The remaining GBP 10 million have already been raised by REL in equity from private investors. The UK authorities claim that the clearance of the GBP 50 million State aid combined with additional GBP 60 million from private investors would enable substantial

[5] Source: Notification form submitted by the UK authorities notification SABRE Engine (page 90).

advancement in the technology, thereby de-risking the follow-on research activities needed for the integration of the key components into a fully scaled SABRE engine for test. Further, aerospace companies would only be interested in collaborating with REL if the TRL is advanced at least at level 6. State aid is therefore claimed to be essential in order to advance the TRL to such a level. According to the UK authorities, the funding is the minimum the company needs to start the project, recruit additional staff and purchase equipment.

(21) SABRE design project constitutes 'industrial research' (77%) and "experimental development" (23%). The aid pledged is claimed to be the absolute minimum to crowd in the remaining financing, and the aid intensity would be relatively low (GBP 50 million out of GBP 120 million, or 42%). Assuming a successful outcome for SABRE design project in late 2017, the ability to raise funding from sources other than public sources for follow-on R&D activities into commercial applications would become less difficult. The more advanced TRL would make commercialisation more predictable (and consequently more attractive for private sources of funding), even though full commercial production will still be several years away (with subsequent steps of prototype testing, integration and production) and will involve considerable further investment exceeding EUR 1 billion.

(22) The UK authorities argue that without State intervention, research and development into the SABRE design project would not be carried out at all. The amount raised at this stage from private equity would not be sufficient to undertake the design and testing required to bring the project to the required TRL, from which point, the project could attract commercial partners[6] for commercial applications. The beneficiary claims that, if the project does not materialise, the shareholders would seek to recover their investment most likely through sale to a company in […]. In addition, according to the UK authorities, further investment from current shareholders at the level required to complete the SABRE design project would not be realistic[7].

(23) Once the Critical Design Review (CDR) phase will be completed in 2017, the project will continue with the Engineering Manufacturing Development phase (EMD) for another 6 years, until 2023. During the CDR phase, the project will not generate any income, but only patents (or at least applications for patents). In 2021 and 2022 REL expects to sell two licences, […].

4. ASSESSMENT

4.1. EXISTENCE OF AID

(24) According to Article 107(1) TFEU, any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, insofar as it affects trade between Member States, be incompatible with the internal market.

(25) Firstly, REL will receive from the UK Government a grant of GBP 50 million. Therefore, the measure involves State resources and it is clearly imputable to the State.

(26) Secondly, REL is the sole beneficiary of the aid which therefore confers a selective advantage to the beneficiary.

(27) Thirdly, the measure is likely to distort competition and affect trade between Member States as other undertakings work or could work on competing products or technologies in the UK or

[6] While commercial partners are likely to join the full SABRE project once TRL 6 is reached, the UK authorities funding at this stage will attract investors who will provide the funding for the non-funded part of SABRE design project.

[7] Source: Notification form submitted by the UK authorities notification SABRE Engine (page 73)

other EU countries. In addition, REL signed or envisage signing partnership agreements with other firms active in the EU aeronautic industry.

(28) In view of the above, the Commission concludes that the grant to REL constitutes State aid within the meaning of Article 107(1) TFEU.

4.2. LEGALITY

(29) By notifying the measure described in Section 3 above and by not implementing the aid before the Commission's decision, the UK authorities have complied with their obligations under Article 108(3) of the TFEU.

4.3. COMPATIBILITY OF THE NOTIFIED AID UNDER THE R&D&I FRAMEWORK

(30) According to Article 107(3)(c) TFEU, aid may be compatible with the internal market if it facilitates the development of certain economic activities or of certain economic areas, where such aid does not adversely affect trading conditions to an extent contrary to the common interest.

(31) The Community Framework for State aid for research and development and innovation (hereafter "the R&D&I Framework")[8] sets forth criteria based on which the Commission will assess whether aid for certain R&D activities is compatible with the internal market under Article 107(3)(c) TFEU.

(32) The objective of the notified measure is to promote R&D activities. Such aid falls within the scope of the R&D&I Framework, as defined in section 1 of that Framework.

4.3.1. Contribution to a well-defined objective of common interest

(33) The UK authorities claim that no other aerospace company is developing a hybrid engine similar to SABRE in the EU. The notified project could therefore form the basis of a new industrial venture through the development of the engine itself, the vehicle that it propels and the space infrastructure that it enables. If successful, the SABRE design project would allow access to a propulsion system which will be integrated in a wider project, in order to realise a single-stage fully reusable prototype vehicle named SKYLON. Its aim is to deliver a payload equivalent to Ariane 6 (i.e. the new generation of Ariane launch vehicles currently under development) but much cheaper and more efficiently. Several European companies expressed their interest to collaborate with REL in the R&D activities related to the project; […] (see points (15) and (16)). Therefore, the SABRE design project could trigger follow-on R&D activities for commercial applications, thereby promoting R&D&I in several Member States. This would in turn contribute to a well-defined objective of common interest by advancing Europe's innovative capability in the space launcher industry.

(34) Without State intervention, research and development into the SABRE design project would fail and would probably not be carried out at all resulting in the loss of a potential new technology. If SABRE design project is cancelled, REL could not survive past its current European Space Agency contract obligations, with the direct loss of 57 jobs during the course of 2015. According to REL, the most likely outcome would be its sale to a company in […].

(35) After the major risk to achieving this technology is removed, and the engine subassemblies designed and scaled, various agencies and aerospace companies would be prepared to work

[8] OJ C 198, 27.6.2014, p. 1.

closer with REL on developing the technology further, resulting in the retention of this technology and intellectual property within the EU, with the direct creation of jobs both within REL and further afield in the supply chain relationships across the UK and Europe.

(36) According to the UK authorities REL will need to enter into a number of collaborative agreements in order to realise the development of the SABRE engine. Discussions are at varying levels of maturity and sensitivity. Discussions with […] on areas such as intake systems, turbo-machinery and propulsion systems are at advance stage

(37) In light of the above mentioned arguments the Commission concludes that SABRE design project will stimulate R&D&I in several Member States thus contributing to a well-defined objective of common interest.

4.3.2. Need for State intervention

(38) Section 4.2 of the R&D&I Framework underlines that State aid must be necessary to increase R&D&I in the European Union in a situation where the market, on its own, fails to deliver an efficient outcome.

(39) The SABRE engine is capable of forming the basis of a new high technology industry through the development of the engine itself, the vehicle that it propels and the space infrastructure that it enables. According to the UK authorities, the lack of projects comparable to SABRE is explained by the fact that the development of such projects is hampered by the existence of market failures that reduce the incentive to invest for private players.

(40) The Commission notes that the individual components and test rigs for SABRE engine need to be built and tested together, and the engine scaled up. As the TRL for the notified project are currently at 4, REL needs to increase the TRL to give potential investors the confidence that its unique technological developments can be scaled up and integrated into the completed SABRE engine design.

(41) In addition to these contextual elements, the UK authorities submitted in their notification a number of arguments showing that technological innovations of SABRE would cause significant positive externalities that the various project sponsors would not be able to appropriate (section 4.3.2.1), and that the project will suffer from a problem of imperfect and asymmetric market information that hamper their financial developments (section 4.3.2.2). Furthermore, potential coordination problems would constitute another obstacle to the realization of the notified project (section 4.3.2.3).

4.3.2.1 Positive externalities

(42) The UK authorities claim the existence of positive externalities both in the form of knowledge spill overs and environmental externalities. In fact, this novel technology cannot work in isolation. Successful development would require REL to share knowledge with strategic partners to enable successful integration. Two-way flow of technology could result in the capture of new intellectual property permitting the use in other sectors and sharing by a wider group of companies.

(43) The Commission considers that while REL's project is limited to the creation of a new propulsion system for space vehicle, the technologies expected to be generated by the supported R&D&I activities would have potential impacts in a number of different industries, such as spare parts industry, satellite launch, spaceports, space tourism, mobile broadcasting, weather and navigation, natural resource management, disaster relief, etc. In addition, some

areas of REL's technology will have applications that could promote spin-offs or technology transfer to sectors that are not at the core of REL activities:

- **Technology spin-offs:** Economic analysis conducted by London Economics[9] indicates specific technology spin-offs that would have a positive impact on investments. In particular, the technologies relate to applications derived from the research on the new heat exchanger, such as the cooling of liquid gas for the shipping industry, engines cooling systems for vehicles, ships, submarines and nuclear reactors, reduced jet engine fuel consumption, reduced infra-red signatures in military jet engines, hypersonic point-to-point transport. Other spin-off technologies include increased knowledge and expertise in the use of advanced materials, including carbon composites, ceramics and metal alloys; the development of autonomous and semi-autonomous vehicles for subsonic, supersonic, hypersonic and orbital regimes; and hydrogen fuel technology, a future market for the aviation industry.
- **Exploration of space spin-offs:** Once transportation to low Earth orbit becomes cheaper, regular, cleaner and safer, there will be revolutionary growth in the utilisation and exploration of space. The step from the Earth's surface to low Earth orbit is by far the most difficult in any space mission, absorbing more than 80% of the resources (effort, propellants, and costs) required. If this step becomes routine and inexpensive, growth in the number of successful launches is likely to follow.

(44) It is also to be said that REL has a proven track record in proactively disseminating information about the SABRE engine. The dissemination of information has taken several forms but has most notably been via the sponsorship of PhD and MSc students (researching technical areas related to the SABRE engine) and outreach activities such as conferences, public presentations, workshops and television interviews. Examples of both forms of knowledge generation are given below:

a. **PhD and MSc Studentships**: 9 PhD and MSc students have studied subjects related to SABRE and published relevant thesis. In most cases they have been sponsored by REL. It is anticipated that further PhDs will be initiated during the notified project, commensurate with the value of the project.

b. **Public Outreach Activities**: REL senior staff regularly undertakes public outreach activities to educate and inform public bodies and organisations on all aspects of the SABRE engine and SKYLON spaceplane: REL has undertaken 46 outreach activities since 2013 (already carried out or scheduled so far for 2015).

(45) According to the UK authorities, REL will use the network of established conferences (which are widely attended by industry and academia) to deliver presentations and technical papers. For example, REL will be presenting the keynote Culpepper lecture at the American Institute of Aeronautics and Astronautics (AIAA) conference in Glasgow in July 2015. In addition, the UK authorities have confirmed that REL regularly seconds staff to the organising committees of such events (eg: International Astronautical Congress).

(46) Moreover, the new technologies and know-how which will result from the implementation of SABRE design project will be shared between REL and sub-contractors. Whilst contractual conditions with sub-contractors have yet to be defined in detail, it is likely that sub-contractors will, generally, retain ownership of foreground IP generated under the project which could enable them to register patents in their own right, but with rights to exploitation relating to the SABRE engine technologies vested in REL. It is to be noted that REL is focussed on the

[9] Source: Notification form submitted by the UK authorities notification SABRE Engine (page 77)

SABRE engine class of propulsion; it does not envisage being an operator of launch vehicles such as SKYLON per se. The model envisages licensing the production of SABRE engines to a competent manufacturer who in turn manufacture and ultimately sell the engine systems to various operators.

(47) From the information provided by the UK authorities, the Commission understands that the project may present further positive externalities, in particular environmental benefits, such as: cleaner rocket propellants, manufacture of reusable components extending SABRE life cycle, reduced carbon and energy consumption, under flight path noise reduction due to lower engine thrust and reduction in space debris in the Low Earth Orbit (LEO) and geostationary orbit (GEO) because no paint, exhaust propellant or spent stages will be expended. In addition, based on the information provided by the UK authorities, REL's innovative heat exchanger technology could provide specific fuel consumption gains of 10% for aero gas turbines through new approaches to air-cooling.

(48) In the light of the foregoing, the Commission notes that there is no clear commitment from the UK authorities with respect to future dissemination of knowledge generated by SABRE design project. Most of the actual plans for knowledge transfer will be through licencing agreements, notably with subcontractors, which will be presumably be concluded at commercial terms and which cannot therefore constitute evidence of positive externalities in the form of knowledge spill-overs. Moreover, the Commission notes that the UK authorities have not been able to quantify the positive externalities generated so far by the project.

(49) Having said that, the Commission notes that the project will be able to generate certain externalities in form of environmental benefits.

4.3.2.2 Imperfect and Asymmetric information

(50) The high risk profile and time horizon of SABRE design project seems to impede further private sector involvement because the initial costs are substantial while returns are not likely to materialise until a later stage.

(51) Before approaching the UK Government in 2012, REL claims to have made numerous attempts to obtain interest and investment from external sources. In particular, REL sought investment from aerospace companies, sovereign wealth funds, banking institutions and investment funds. All efforts have failed because it was impossible to attract investment without having designed and developed the necessary components and their drawings with supporting test results to upgrade the TRL and prove the technology's viability to industry. As shown by the information provided by the UK authorities, the ground for refusals from several private investors was 1) long timescales involved before any guaranteed return 2) no formal valuation of IP (although REL has filed 13 patents in the UK and 8 in the U.S.) and 3) high level of risk[10].

(52) In October 2014, for the project at issue, REL appointed […], an investment banking firm, […] to facilitate primary investment capital into the business.

(53) As regards the type of funding that could be attracted, the UK authorities indicate the following:

- **Debt:** it does not represent an option for funding at this point, given that the company has no revenue streams or tangible assets to secure a debt facility against. Yet, the company has expensed its costs rather than capitalised them and the company's core intellectual property is not recorded or capitalised on its balance sheet.

[10] Source: Notification form submitted by the UK authorities notification SABRE Engine (page 72)

- **Ordinary Equity:** REL raised GBP 10 million in ordinary equity to support continuous liquidity until State aid clearance can be achieved to develop SABRE. This fundraise was completed in June 2014; 80% of the funds raised were from existing shareholders, many have been invested for a long period. According to the UK authorities, current shareholders are unwilling to support further financing rounds. [11]

- **Partner Funding:** According to the UK authorities, REL's confidence of raising additional capital has been heightened by the considerable benefit of the UK government's commitment announcements which has created a significant level of interest from potential partners. Additionally, the technological progress made by REL and the 'vote of confidence' in the company's technological progress from independent assessments made by the European Space Agency has further fuelled this interest.

- **Short Term Funding:** As shown by the information provided by the UK authorities, REL has spoken with its local bankers and asset financing/ leasing entities regarding sources of funds to cover working capital cycles associated with drawing down funds in arrears and freeing up funding to assist capital expenditure investments. In both cases these sources of funds are not presently available until the Commission approves the notified aid. [12]

(54) It seems that past competitive rivalry with other aerospace companies, […], has so far culminated in their refusal to collaborate with REL, preferring to concentrate on their existing […] technologies rather than take the investment risk and incubate a potentially disruptive technology.[13]

(55) Additionally, conversations with two well established financial institutions (with similar scale investments) are underway with the likely proviso that investment will be contingent on both State Aid approval and the presence of an aerospace prime as a strategic partner, proving the interest of private financing for the project.[14]

(56) The UK Government's stated intention to award the aid has changed the landscape and, as a result, REL went out and successfully raised GBP 10 million in fresh equity investment in mid-2014. A further result of the Government's commitment has been the opening of discussions with […] potential prime aerospace partners. […]

(57) The Commission notes that, absent State aid, the programme would not be attractive either to lending institutions or to equity partners. In conclusion, the Commission notes that the combination of risk associated with developing innovative space-related technology and broader market difficulties associated with early stage of development of the relevant technology has prevented REL from obtaining large amounts of capital investment.

4.3.2.3 Coordination and network failure

(58) The information provided by the UK authorities only indicates that REL has received positive interest in future collaboration (i.e. as from TRL 6) from […]. It is to be noted that some of these companies […], despite the early stage of technology development. Moreover, […] will most likely be significant subcontractors to the programme, given their specialities in particular areas of the technology development.[15]

[11] See supra footnote 7

[12] Source: Notification form submitted by the UK authorities notification SABRE Engine (page 73)

[13] Source: Notification form submitted by the UK authorities notification SABRE Engine (page 70)

[14] Source: Submission of information of 24.04.2015 (page 8)

[15] Source: Submission of information of 24.04.2015 (page 9)

(59) The Commission notes that these agreements point out to the positive effects that the aid might have in stimulating follow-on collaborative R&D activities. However, such arguments do not convey any evidence of possible coordination failures specifically affecting the notified project which, as explained in section 2 above, is due to be carried out by a single company, REL.

(60) In the light of all the above arguments, the Commission concludes that the project at issue is affected by a market failure within the meaning of the point 4.2.1 of the R&D&I Framework mainly due to asymmetry of information and, to a more limited extent, to positive externalities which makes it unlikely to be implemented in the absence of State aid.

4.3.3. Appropriateness of the aid measure

(61) The UK authorities estimate that the grant is an appropriate instrument as it enables the implementation of SABRE project while properly addressing the identified market failure. No other means would achieve the same result without distorting competition and affecting trade.

(62) In particular, the UK authorities argue that the grant is an appropriate form of aid because the technology that REL is developing has not been proven and remains far from market. Moreover, SABRE engine will not be demonstrated in full until a working prototype will be built. REL will not generate revenues until at least 2021 and would therefore be unable to service any debt costs or repayment of loan (see section 4.3.2.2). A loan or repayable advance would also make the project less attractive to potential investors, without whom the project would be unsustainable as their funding is essential.

(63) The UK authorities claim therefore that the funding options available to REL at this point in its development cycle are very limited, given the quantum of funds required at the current relatively immature TRL. If another funding route had been chosen, such as a loan or repayable advance, the costs incurred to REL would have a substantial negative impact on the project's NPV.

(64) In light of these arguments, the Commission considers that a grant is an appropriate form of aid, given the relative remoteness of the project from the market. In particular, while a repayable advance is generally better suited from R&D projects consisting mainly of experimental development, this form of aid could prove inadequate in the case at issue, where 77% of the costs are for industrial research activities.

4.3.4. Incentive effect

(65) As regards compliance with the formal incentive effect, it should be noted that the R&D works started in July 2015, while the aid application pre-dated the start of works, as it was made in January 2012, followed up in May 2013[16]. As regards, compliance with the substantive incentive effect test, it should be recalled that State aid must trigger a change in behaviour which would lead to an increase in the beneficiaries' R&D activities. Section 4.3.4 of the R&D&I Framework sets the conditions which need to be fulfilled in order to demonstrate the incentive effect of the individual aids.

4.3.4.1 Specification of intended change

(66) From the information provided by the UK authorities the Commission understands that the project is supposed to raise additional funding of GBP 60 million from private investors (see point (20)). The recent equity drive (i.e. GBP 10 million) was the largest ever undertaken by

[16] Source: Notification form submitted by the UK authorities notification SABRE Engine (page 8).

REL and was made possible by the UK commitment to grant the notified aid and the technological advancements which could be achieved as a result. As stated, further investment from shareholders at the level required to complete the SABRE design project cannot be expected.

4.3.4.2 Counterfactual analysis

(67) Based on the information provided by the UK authorities, the Commission considers that without State intervention, research and development into the SABRE design project would probably not be carried out at all (see points (22) and (34)). In addition, the atomization of shareholding (see point (6)) decreases the likelihood of additional resources to be committed from the existing shareholders. Therefore, in the absence of aid, the counterfactual scenario would be that the project would not be carried out altogether.

4.3.4.3 Amount of investment and time frame of cash-flows

(68) There are various indicators that can be used to verify the impact of aid on the project's profitability level, including the NPV and IRR of the project. Point 70 of the R&D&I Framework specifies that "[...] *the level of profitability can be evaluated by reference to methodologies which are demonstrably used by the beneficiary undertaking or are standard practice in the particular industry concerned, and which may include methods for evaluating the net present value of the project (NPV), the internal rate of return (IRR) or the average return on capital employed (ROCE)*"

(69) Taking into account the fact that, absent the aid, REL will discontinue the project and will not pursue any alternative project (no counterfactual scenario), the UK authorities provided several financial indicators (NPV, IRR) to the Commission in the following two situations:

- a scenario "*SABRE with aid*", that is a R&D program for 9 years which assume selling of project's IP rights, i.e. licenses in respectively 2021 and 2022 (see below the methodology for licences' valuation – point (70));

- a second scenario "*SABRE without aid*" a fictitious scenario which intends only to illustrate the impact of aid on the investment decision criteria.

(70) The profitability calculations were made from the business plan of REL, which is based on a set of assumptions about costs and revenues of the beneficiary. The project's NPV was calculated with and without the aid, in order to evaluate the necessity of the notified aid. Licensing is one method used to realise a return on technology investment and is used as the basis for this appraisal. […]

(71) The UK authorities claim that the value of licence agreements for aerospace engine technology seems not readily available in the public domain and the game-changing capabilities of the SABRE engine are likely to bring unique characteristics to any such deal. Qualitatively, an amount of […] to gain access to the SABRE engine technology appears to be the correct order of magnitude. A survey of engine production licence agreements showed that this is a typical business model. In one instance, a value of USD 250 million (GBP 156 million) was reported for the licensed production of a conventional Russian jet engine in India in 2009.

(72) Moreover, a key input to the investment appraisal is the discount rate applied to the programme. In the present case, the UK authorities indicate that investors require a high rate of return to compensate for high volatility and risk. Based on the assumptions of the company, the aid will enable the project to achieve an IRR of 35%, which is close to REL's average risk

adjusted WACC[17] of 36%. The project NPV amounts to GBP 3.9 million in the "aid" scenario and to a negative value of GBP - 15.3 million in the "no aid" scenario.

(73) In essence, the NPV becomes slightly positive in the scenario with aid and remains largely negative in the no-aid scenario. In addition, the difference between the average risk adjusted WACC (36%) and IRR in the scenario with aid is 0.85%, which shows the alignment between the high cost of capital used and the IRR generated by the project (see below).

Table 1: comparison of financial indicators in the various scenarios:

	Scenario "**No Aid**"	Scenario "**With Aid**"
NPV (mGBP)	-15.3	3.9
IRR (%)	24.77%	35.15%

(74) The Commission considers that, having regard to potential risks of unforeseen engineering challenges, as well as risks of cost and time overruns, the level of discount rate applied in the above conditions seems justified.

(75) The table below summarises the types of risks involved in the project and their impact on the planned objectives:

Table 2: Identified Risks

	Assessed level of occurrence	**Impact**	**Reason**
Programme late delivery	High	High	Complex programme with large external dependencies
Programme cost overrun	High	High	Complex programme with large initial cost uncertainties
Adverse cash flow and funds not forthcoming	High	High	Funds from commercial sources carry perceptions of high risk for new technology
Unavailability of component test facilities	Moderate	Moderate	Competing programmes and political constraints
Unavailability of externally sourced items	Moderate	Moderate	USA ITAR restrictions on USA manufactured items
Technology development problems	Moderate	Moderate	Technology working at material limits to achieve flight weight
Low workforce growth and availability	Moderate	High	Competing programmes in expanding economy. Graduate skills mismatch
Limited subcontractor	Moderate	High	Competing programmes. Limited surplus workforce and facilities

[17] The risk adjusted WACC reflects the changing technology levels as the programme progresses, using the European Investment Bank (EIB) benchmarks referred to in the proposal. Looking at the IRR of cash flows, 35% is in line with European Investment Bank target returns for venture capital for expansion stage financing. The risk level has been reflected in the adjusted WACC figures with reference to the EIB (i.e. lowering as technology matures and the financial stage moves from first stage to later stage). As such a flat rate annual WACC of 35% would yield the same result as the varying technology risk adjusted WACC figures used, which fits the EIB category of financing stage between first and later stage.

availability			
Loss of technology to country outside the EU	Moderate	High	Failure to obtain funding and clearance

(76) Finally, the UK authorities also claim that in this industry significant development projects are typically government funded (usually on a "cost plus" basis) so as to mitigate investment risks during the development phase. Moreover, it is unusual for cases of risky ground breaking technologies to be privately funded to the necessary degree at these early stages.

(77) In light of the above mentioned arguments, the Commission concludes that, given the risks the projects might encounter, the aid has an incentive effect because it is necessary to ensure a fair rate of return and induce investment into a project, which, without the aid would not be carried out at all.

4.3.5. Proportionality of the aid

(78) The analysis of the proportionality of State aid for R&D will be carried out using the conditions specified in Section 4.5 of the R&D&I Framework, which provides for general conditions (research categories and eligible costs) and additional criteria (aid intensities).

(79) According to the information provided by the UK authorities, REL is a medium company and, subject to the Commission's approval, it will receive GBP 50 million aid for a total project cost of GBP 120 million. The research activities involved in the project fall under the categories of "industrial research" and "experimental development" according to a 77% to 23% ratio. Pursuant to the R&D Framework, these two categories of research can benefit from aid up to a maximum aid intensities of 60% and 35% respectively for a medium-size company such as REL. From the information provided by the UK authorities, the Commission understands that all the costs of the project are eligible. REL is entitled to receive aid of GBP 55.4 million[18] for the industrial research and GBP 9.6 million[19] for experimental development. In total, REL might be entitled to receive aid up to GBP 65 million (54%). Therefore, the aid amount (GBP 50 million, or 42% of eligible costs) is considerably lower than the maximum limit allowed by the R&D&I Framework.

(80) The UK authorities payments are contingent on REL raising funding as well as delivering technical milestones, as described in Table 3 below.

Table 3: The technical and financial milestones

[…]

(81) The Commission notes that the UK authorities committed to grant the aid to REL in successive *tranches* against the successful delivery of the project milestones. These milestones are not solely of a technical nature, REL is committed to attract additional funding alongside the grant funding so as to respect the maximum aid intensity allowed under the R&D&I framework. Moreover, the UK authorities committed to monitor closely and continuously review the efforts of REL in attracting additional funding (see above Table 3). Therefore the risk of the UK authorities funding not being matched is excluded, in principle, as the release of these funds will be on an incremental basis, and only after each milestone has been achieved.

[18] GBP 55.5 million = GBP 92.4 million x 60%

[19] GBP 9.6 million = GBP 22.7 million x 35%

(82) The ability of REL to conform to this commitment seems to correspond with past fund raising experience. For instance, over the 2009-2014 period, for every 1 GBP of ESA funding received, the company was able to raise over 4 GBP of private investment, totalling over GBP 30 million. Investors have included large financial institutions (including Elliott Associates L.P., Odey Asset Management and Artemis) and high net worth individuals.

(83) Therefore, the Commission notes that aid will allow REL to implement the project by providing the necessary financial resources while significantly reducing its maximum financial exposure (see points (72) and (73)). At the same time, the Commission concludes that the aid will be limited to the minimum as the aid intensities provided for the in the R&D&I Framework will be respected.

4.3.6. Avoidance of undue negative effects on competition and trade

4.3.6.1. Distortion in product markets

a) The markets

(84) The Commission notes that SABRE design project aims at a very specific objective: the design of the key components a new type of engine for space launchers, including an innovative heat exchanger. The engine integrated into will be able to work both in air-breathing and rocket mode. If successful, such an innovative engine will be tested on a prototype air frame named SKYLON. Therefore, the notified aid may have an impact, at least in theory, on several markets, notably (i) the heat exchanger markets, (ii) the market for space launchers engines and (iii) the space launcher market.

i. Heat exchangers markets

(85) When assessing the potential impact of SABRE heat exchangers technology, it should be noted that the broad heat exchanger sector is characterised by the presence of many large and medium sized manufacturers across the globe[20]. Some of the leading players include Alfa Laval AB, GEA Group and Xylem. This sector is growing fast, with a recent report[21] forecasting a global growth rate of 6.05% per annum over the 2014-2019 period and an overall value estimated at USD 21 billion by 2019[22].

(86) Such a sector can be subdivided in several relevant markets the definition of which mainly depend on the specific industrial applications that each heat exchanger technology is designed to address. REL has identified four potential applications for the SABRE technology, i.e. engines for space launchers, defence systems (for thermal management in air systems), HVAC applications (heating, ventilation and air conditioning) and water desalination. However, these potential future applications rely on additional and specific R&D investments necessary to adapt the technology to the requirements of each product market. The notified project is concerned with one of these potential applications, namely the design and integration of an innovative heat exchanger into a new type of space launcher engine. Therefore, the impact of the notified aid has to be considered in respect of the latter market.

ii. The market for space launchers engines

(87) The Commission notes that space launchers are currently propelled by engines using, multi-stage expendable launchers, jettisoned after take-off. The market for space launchers engines is characterised by the presence of a small number of large companies whose operations are

[20] http://www.oilandgasnewsonline.com/Article/37479/Heat_exchangers_market_worth_$195bn_by_2019

[21] http://www.researchandmarkets.com/reports/3138704/global-heat-exchanger-market-2015-2019

[22] http://www.marketsandmarkets.com/PressReleases/heat-exchanger.asp

strongly integrated downstream into the production of space launchers. Therefore, the position of the incumbents on the launcher engine market can be assessed by taking into account their shares in the downstream market for space launchers. The main players include[23]: Starsem (20%), United Launch Alliance (15.2%), Arianespace (11%), International Launch Services (9%), SpaceX (7%), Orbital Sciences Corporation (3%), Sea Launch (1%) and China Aerospace Science and Technology Corporation (market shares not available)[24].

(88) REL is not currently present on this market as it has never manufactured and sold engines for space launchers. If the notified project would prove successful, REL could potentially enter this market with a new competitive technology. However, it should be noted that the follow-on R&D activities which will be necessary for the integration of REL's newly designed engine components into the planned SABRE engine are not covered by the notified aid and will require cooperation with other players.

(89) There are several research projects currently aimed at decreasing launching costs, either by improving the payload capacities or by improving the capabilities of the engines. For instance, SpaceX's Grasshopper will be a reusable rocket still relying on expendable launchers, jettisoned after take-off. However, the rocket itself will be able to reignite engines and land safely for subsequent re-use, thus reducing the launching costs to an estimated average $56 million per launch[25]. The notified project aims at introducing a radical innovation within this market, which may further reduce launch costs by enabling the development of a non-disposable engine for a fully reusable air-frame.

(90) The Commission notes that there are currently two other initiatives, in the United States and Japan, aimed at developing a non-disposable engine for fully reusable air-frames. Firstly, the Japanese Ministry of Economy, Trade and Industry has financed a pre-cooled turbojet project (the HIKARI project) which could be viewed as a competitor to REL and which may move first to market. At present, the Japanese Aerospace Exploration Agency (JAXA) is conducting performance analysis of a pre-cooled turbojet engine (PCTJ), which can operate from take-off to Mach 5 using hydrogen both as coolant for pre-cooler and as fuel for combustor. Secondly, information provided by the UK authorities indicates that the US Air Force has tasked Lockheed Martin and Aerojet Rocketdyne to develop a launch vehicle whose propulsion system would be similar to SABRE's.

(91) Therefore, the aided project will enter in competition with other substitutable technologies. However given their early stage of development and the incertitude regarding their successful integration in commercial-scale space launchers, no reliable estimation of their potential market penetration can be made at this stage.

iii. Market for space launchers

(92) The launcher market has been growing steadily during the last decade reaching 92 launches in 2014[26]. The total value of the market for commercial launchers to deliver goods to orbit is estimated at approximately USD 9 billion, with commercial launches accounting for approximately USD 2-3 billion of the total each year.

[23] Source: News, Federal Aviation Administration

[24] The market shares are based on the number of launches carried out in 2014 and therefore can only represent a proxy for the incumbents' market power. However, should a different methodology be used to assess the market power of the incumbents, it will not change REL's position in this market because it is a newcomer on the market and therefore its market share is zero whatever methods is used.,

[25] Launch costs typically vary between USD 30 million and USD 400 million depending on the launch vehicle and payload size.

[26] ttps://www.faa.gov/about/office_org/headquarters_offices/ast/media/FAA_Annual_Compendium_2014.pdf

(93) As pointed out above at point (86), a small number of large and strongly integrated companies operate world-wide on this market, including Starsem, United Launch Alliance, Arianespace, International Launch Services, SpaceX, Orbital Sciences Corporation, Sea Launch and China Aerospace Science and Technology Corporation.

(94) The Commission notes that REL has neither the capability nor the intention to become an operator in the market for space launchers. Rather, its strategy is to carry out the notified project in order to reach the demonstration stage (TRL6) by using SKYLON as a prototype so as to prove the validity of the newly designed non-disposable engine. Therefore, any future commercial activity by REL will consist in licensing out its technology, once proven, and/or enter into cooperation agreements with the incumbents of the sector for further research on the integration of SABRE engines into newly designed space launchers.

(95) In this respect, the Commission understands that REL has received positive interest in future collaboration from […] and from several European public bodies […] who wish to participate in the programme (see point (15)).

(96) As such, therefore, the notified aid will not enable REL to enter the market for space launchers and does not affect directly such a downstream market.

iv. Geographic dimension

(97) The trend has been for public space research and defence bodies to use indigenously developed space vehicles for launching public institutional payloads. In this context, however, there has been intense international cooperation aimed at sharing knowledge and costs linked to highly risky R&D. In addition, during the last two decades, a strong demand from commercial users has addressed the space launcher industry at global scale. Such demand is mainly driven by industries such as IT&C, broadcasting, meteorological forecasts, which buy launching services worldwide. In particular, in the EU, the space launchers industry is strongly integrated in a system of international cooperation within the European Space Agency.

(98) Therefore, the Commission consider that the geographic dimension of the markets for space launchers and related technologies is likely to be world-wide or at least EU-wide.

b) Distorting dynamic incentives

(99) The Commission considers that the notified aid is unlikely to have harmful crowding out effects for the following reasons.

(100) Firstly, the SABRE design project comes within a dynamic and growing market where the demand from commercial users is expected to increase in the upcoming years. Independent analysis has shown that the demand for launches could increase by a factor of 4 to 7 over the upcoming decade[27], such a growth being dependent on the ability of global players to improve the current state of the art by reducing launching costs. There are currently two directions to improve the current state of the art. On the one hand, incumbent operators are investing in R&D projects aimed at reducing the operating costs of space launchers through incremental innovations of existing technologies (see section 2.4.3 above). On the other hand, there are attempts in Europe, US and Japan to devise a breakthrough technology able to change the paradigm of the industry (see section 2.4.1 and 2.4.2 above).

(101) Evidence to date suggests that, following the introduction of SpaceX's lower cost Falcon 9 rocket, competitors have continued to invest in new technologies. For example, United Launch

[27] Market Opportunity Review, LEK Consulting, 2012

Alliance plans to compete with SpaceX[28] and ESA is also responding to this competitive challenge with the development of the new Ariane 6 rocket[29]. Moreover, given the early stage of current R&D on alternative space launcher engines such as SABRE, it is unlikely that actual and potential competitors will be deterred by the notified aid to continue their own R&D activities. Rather, the fact that the notified aid would be targeted at bringing the SABRE design project from TRL 4 to TRL 6 could be seen by competitors as a challenge to intensify their efforts to come first with innovative solutions so as to capture a substantial share of such a growing market.

(102) Secondly, given the estimated value of the space launcher market (USD 9 billion), the aid amount appears to be relatively modest (GBP 50 million). In addition, the full integration of the new components into the future SABRE engine will require further investments from REL and other interested partners in the order of EUR 1 billion. Therefore, in relative terms, the aid amount at issue is unlikely to constitute a significant distortive factor.

(103) Thirdly, looking at the closeness of the project to the market and the nature of the aided activities, it is important to underline that the aid covers mostly industrial research activities. Because the final products in which the expected innovations will be applied (i.e. SABRE engine) will require substantial additional R&D and will be exploitable in a rather far time horizon, the impact of the aid on the downstream markets can be considered as very indirect, which reduces the risk of distorting competitors' incentives to invest.

(104) Fourthly, the level of barriers to exit seems to be relatively high. R&D for space launcher engines involves considerable sunk costs spent over a long period, which makes it highly unlikely that players having undertaken investments to enter and/or stay on the market will decide to reduce their efforts because of the notified aid, particularly if one takes into account the relatively small aid amount compared to the full development costs of a new propulsions system for space launchers.

(105) Finally, the market for space launcher engines is highly differentiated due to the complexity of the technologies incorporated into the final product. On this market competition on quality and reliability of technological solutions is as crucial as the relative prices per launch. As indicated at points (88) and (89) above, SABRE technology is subject to competitive constraints coming not only from incremental innovations brought to the market by incumbent operators (e.g. SpaceX's Grasshopper) but also from parallel R&D projects in Japan and the US aimed at drastically reducing launching costs through the introduction in the market of non-disposable engines for fully reusable launchers. The ability of these new technical solutions to gain the confidence of launchers manufacturers and, ultimately, of industrial users of launching services has still to be proven. Therefore, in this context, it is unlikely that REL's competitors would refrain from bringing their projects forward due to the envisaged aid. It may be observed incidentally that, as far as the Japanese and US parallel R&D projects are concerned, both of them seem to benefit from public support by the respective governments.

(106) Moreover, as the integration of new technologies into innovative engines (and in turn into specifically designed space launchers) requires the cooperation of different actors operating at various levels of the supply chain, the timing of the introduction of a new technology in the market is also of importance. Early cooperation agreements with space launcher producers could give the holder of a new engine technology a first mover advantage by locking-in key downstream players. In this respect, available information suggests that the HIKARI project

[28] http://www.washingtonpost.com/blogs/the-switch/wp/2015/03/02/ula-ready-to-compete-against-elon-musks-space-startup-ceo-says/

[29] http://spacenews.com/desire-for-competitive-ariane-6-nudges-esa-toward-compromise-in-funding-dispute-with-contractor/

may be the first to move to the market, which further decreases the potential risks of crowding out effects of the notified aid.

(107) In light of the above arguments, the Commission considers that the aid will not induce significant distortions of dynamic incentives.

c) Creating or maintain market power

(108) As indicated in point (86) above, the market directly affected by the notified aid, i.e. the global market for space launcher engines, is characterised by the presence of a small number of strong and vertically integrated players. At the present stage, REL may only be regarded as a potential entrant. Indeed, if successfully developed, its innovative technology could enable REL to move forward into subsequent phases of product development, most likely in cooperation with other players, in order to achieve the integration of this technology into a newly designed SABRE engine. However given the relative remoteness of the notified project from the market, it is unlikely that the aid could contribute to confer REL with any significant market power.

(109) Firstly, it should be observed that, far from contributing to a deterioration of the market structure, the successful outcome of the project could create the conditions for a new market entry and enable downstream players to benefit from an additional technological solution for fully reusable launchers.

(110) Secondly, even considering the potential effects of the aid on the technology market for non-disposable launcher engines, the presence of competing emerging technologies (one of which, HIKARI, being at a more advanced stage of development) is likely to prevent REL from acquiring a gatekeeper position on such an upstream market.

(111) Thirdly, there several barriers to entry recognized by the industry:

a. Capital: the cost of developing new space propulsion and launch systems is substantial (billions of Euros);
b. Customer loyalty: customers desire reliable launch systems giving incumbents an advantage due to proven track records and existing customer relationships;
c. Government regulations: regulations relating to the design of launch systems increase development costs and export control regulations can limit access to international markets, reducing the overall market accessible to new entrants;
d. Research and Development: Substantial research and development is required to bring new products to market in the high tech aerospace sector;
e. Cost Advantages: Incumbents have advantages including proprietary technology and know-how and learning curve advantages.

Moreover, in a market where the main manufacturers of space launchers are vertically integrated, companies operating only on the upstream technology market such as REL are faced with an additional entry barrier as their market success will ultimately depend on their ability to enter into cooperation agreements with other companies operating downstream. Therefore, in such market circumstances, the notified aid should help REL to overcome these constraints rather than creating artificial obstacles for competitors.

(112) Finally, the notified aid is all the more unlikely to confer REL the power to licence out its SABRE technology at supra-competitive prices given the presence on the downstream markets of few and strong potential licensors which may be willing and able to integrate SABRE engines into fully reusable space launchers.

d) Maintaining inefficient market structures

(113) As already observed, far from maintaining inefficient market structures, the notified aid is designed to enable REL to enter a technology market which it could not access absent the aid. Moreover, the introduction of SABRE technology is expected to foster cooperation with a wider set of downstream operators through licensing agreements, thereby contributing to sustain the growth of the market for space launchers.

e) Conclusion on avoidance of undue negative effects on competition and trade

(114) In conclusion, the Commission considers that the aid to SABRE design project is not likely to distort competition to an extent contrary to the common interest.

4.3.6.2. Location effects

(115) The Commission notes that although the project is developed by a company located in the UK, REL will have to enter into cooperation agreements with other organisations across Europe in order to carry out the subsequent R&D activities in view of the integration of the new SABRE engine in a fully reusable space launcher (see point (15)). This will offer the project an European dimension, thus avoiding potential adverse effects on the chosen location.

4.3.6.3. Conclusion on the distortion of competition

(116) In light of the above mentioned arguments, the Commission considers that the aid to REL is not likely to distort competition to an extent contrary to the common interest.

4.3.7. Transparency

(117) The Commission takes note that the UK authorities commit to comply with the transparency requirements in point 4.7 of the 2014 R&D&I Guidelines.

(118) The UK authorities argued that the envisaged R&D&I aid would entail no risk of competitive harm because there would be no European player currently engaged in comparable R&D&I projects and certainly no actual supplier of substitutable technologies. The notification only hints at possible parallel research which might be carried out in parallel in the US.

5. DECISION

(119) The Commission considers the notified State aid SA.39457 (2015/N) to be compatible with the internal market, pursuant to Article 107(3)(c) TFEU. Accordingly, it decides not to raise objections to the aid measure.

(120) The Commission reminds the UK authorities that, in accordance with Article 108(3) TFEU, all plans to change this aid measure must be notified to the Commission.

(121) The Commission reminds the UK Government to provide an annual report on the implementation of the measure.

If this letter contains confidential information, which should not be disclosed to third parties, please inform the Commission within fifteen working days of the date of receipt. If the Commission does not receive a reasoned request by that deadline, you will be deemed to agree to the disclosure to third parties and to the publication of the full text of the letter in the authentic language on the Internet site: http://ec.europa.eu/competition/elojade/isef/index.cfm.

Your request should be sent by registered letter or fax to:

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Yours faithfully,
For the Commission

Margrethe Vestager
Member of the Commission

CERTIFIED COPY
For the Secretary-General,

Jordi AYET PUIGARNAU
Director of the Registry
EUROPEAN COMMISSION