



CORPORATION TAX – claim for research and development tax credit – whether the activity in respect of which the expenditure was incurred qualified as research and development in accordance with the terms of the guidelines published by the Department for Business, Innovation and Skills – no, because the Appellant had failed to establish on the balance of probabilities that the activity involved a project seeking to achieve a technological advance through the resolution of a technological uncertainty – appeal dismissed

**FIRST-TIER TRIBUNAL
TAX CHAMBER**

Appeal number: TC/2019/06690

BETWEEN

GRAZER LEARNING LIMITED

Appellant

-and-

**THE COMMISSIONERS FOR
HER MAJESTY'S REVENUE AND CUSTOMS**

Respondents

TRIBUNAL: JUDGE TONY BEARE

The hearing took place on 16 September 2021. The form of the hearing was V (video) on the Tribunal video platform. A face-to-face hearing was not held because of the COVID pandemic. The documents to which I was referred were a documents bundle of 188 pages (the “DB”) and an authorities bundle of 222 pages.

Prior notice of the hearing had been published on the gov.uk website, with information about how representatives of the media or members of the public could apply to join the hearing remotely in order to observe the proceedings. As such, the hearing was held in public.

Mr Jonathan Scott and Ms Sara Andrews of Haines Watts, for the Appellant

Mr Daniel Hickey-Baird, litigator of HM Revenue and Customs' Solicitor's Office, for the Respondents

DECISION

INTRODUCTION

1. This decision relates to a claim by the Appellant for a tax credit of £26,050 in respect of expenditure incurred on research and development (“R&D”) in its accounting period ending 31 October 2017. The tax credit in question was initially paid to the Appellant on 6 June 2018 but, following the opening of an enquiry into the accounting period in question on 5 October 2018, the Respondents issued a closure notice on 9 September 2019 denying the claim and requiring the tax credit to be repaid.

2. The Appellant is a small company which seeks to match providers and customers of digital learning services. The expenditure giving rise to the claim which is the subject of this decision related to the intended creation of a platform which would take into account a learner’s prior experience and specific learning goal in offering learning content. The Appellant’s director, Mr Mark Webber, has considerable prior experience in the learning sector but is not himself a software engineer. Accordingly, the Appellant engaged a firm of software developers called Halcyon Consulting (“Halcyon”) to create the software platform to achieve the objective and the claim relates to the expenditure which was incurred by the Appellant under its contract with Halcyon.

THE R&D REGIME

3. I do not propose to spend much time in this decision outlining the intricacies of the R&D regime, given that the issue which is in dispute between the parties relates to just one small part of that regime. It suffices to say that the regime provides for tax relief for a small or medium sized enterprise which incurs, *inter alia*, “qualifying expenditure on contracted out research and development”, as defined in Section 1053 of the Corporation Tax Act 2009 (the “CTA 2009”). In order for expenditure to satisfy the definition in Section 1053 of the CTA 2009, it needs, *inter alia*, to be “attributable to relevant research and development undertaken on behalf of the company” (see Section 1053(2) of the CTA 2009). The phrase “research and development” for this purpose is defined in Section 1138 of the Corporation Tax Act 2010, which in turn refers to regulations made by the Treasury under Section 1006 of the Income Tax Act 2007. The regulations in question are the guidelines produced by the Department for Business, Innovation and Skills on 5 March 2004, as updated on 6 December 2010 (the “Guidelines”).

4. It is common ground that the sole issue between the parties in relation to the tax credit which has been claimed by the Appellant is whether all, or an identifiable part, of the expenditure incurred by the Appellant in making its payments to Halcyon fell within the scope of the Guidelines.

THE GUIDELINES

5. The parts of the Guidelines which are relevant to the dispute are paragraphs 3 to 32 of the Guidelines. For ease of reference, those provisions are set out in full in the Appendix to this decision.

6. It may be seen from the relevant provisions that:

(1) in order for the expenditure incurred by the Appellant to qualify for relief as R&D expenditure:

(a) it needs to have been incurred pursuant to a “project” (see paragraph 3 of the Guidelines);

(b) that project must have been seeking to achieve an “advance in science and technology” (see paragraph 3 of the Guidelines); and

- (c) the activities to which the expenditure relates must either:
- (i) have been intended to “contribute directly” to achieving that advance in science and technology through the resolution of “scientific or technological uncertainty” (see paragraph 4 of the Guidelines); or
 - (ii) amounted to “qualifying indirect activities” in relation to the project (see paragraph 5 of the Guidelines);
- (2) for the purposes of paragraph 6(1)(a) above, a “project” consists of a number of activities conducted to a method or plan in order to achieve an advance in science or technology and encompasses all of the activities which collectively serve to resolve the scientific or technological uncertainties associated with achieving the advance (see paragraph 19 of the Guidelines);
- (3) for the purposes of paragraph 6(1)(b) above:
- (a) an “advance in science and technology” is an advance in “overall knowledge or capability” in a field of science or technology and not simply in a company’s own state of knowledge or capability alone (see paragraph 6 of the Guidelines);
 - (b) an adaptation of knowledge or capability from another field of science or technology can comprise an advance in science or technology only if it was not readily deducible (see paragraph 6 of the Guidelines);
 - (c) a process, material, device, product, service or source of knowledge does not become an advance in science and technology simply because science or technology is used in its creation. Work which uses science or technology but which does not advance overall knowledge in a field of science or technology is not an advance in science or technology (see paragraph 8 of the Guidelines);
 - (d) the following are expressly stated to amount to an advance in science and technology:
 - (i) a project which seeks to extend overall knowledge or capability in a field of science or technology;
 - (ii) a project which seeks to create a process, material, device, product or service which incorporates or represents an increase in overall knowledge or capability in a field of science or technology;
 - (iii) a project which seeks to make an appreciable improvement to an existing process, material, device, product or service through scientific or technological changes; and
 - (iv) a project which seeks to use science or technology to duplicate the effect of an existing process, material, device, product or service in a new or appreciably improved way,
- (see paragraph 9 of the Guidelines);
- (e) it is not necessary for the advance in science or technology sought by the project to be achieved or fully realised (see paragraph 10 of the Guidelines); and
 - (f) the routine analysis, copying or adaptation of an existing product, process, service or material is not an advance in science and technology (see paragraph 12 of the Guidelines);
- (4) for the purposes of paragraph 6(1)(c)(i) and 6(2) above:

- (a) “scientific or technological uncertainty” exists when knowledge of whether something is scientifically possible or technologically feasible, or how to achieve it in practice, is not readily available or deducible by a competent professional working in the field (see paragraph 13 of the Guidelines);
 - (b) uncertainties that can readily be resolved by a competent professional working in the field are not scientific or technological uncertainties (see paragraph 14 of the Guidelines); and
 - (c) similarly, improvements, optimisations and fine-tuning which do not materially affect the underlying science or technology is not work to resolve a scientific or technological uncertainty (see paragraph 14 of the Guidelines);
- (5) for the purposes of paragraph 6(3)(a) above:
- (a) “overall knowledge or capability” in a field of science or technology means the knowledge or capability in the field which:
 - (i) is publicly available; or
 - (ii) readily deducible from the publicly available knowledge or capability by a competent professional working in the field (see paragraph 20 of the Guidelines); and
 - (b) the routine analysis, copying or adaptation of an existing process, material, device, product or service is not an advance in “overall knowledge or capability” even though it may be completely new to the company or the company’s trade (see paragraph 22 of the Guidelines);
- (6) for the purposes of paragraph 6(1)(c)(i) above:
- (a) an activity “directly contributes” to achieving an advance in science or technology where it attempts to resolve an element of the scientific or technological uncertainty associated with achieving the advance (see paragraph 26 of the Guidelines);
 - (b) those activities include:
 - (i) the creation or adaptation of software, materials or equipment needed to resolve the scientific or technological uncertainty, provided that the software, material or equipment is created or adapted solely for use in R&D;
 - (ii) scientific or technological planning activities; and
 - (iii) scientific or technological design, testing and analysis undertaken to resolve the scientific or technological uncertainty; and
 - (c) those activities do not include, *inter alia*, qualifying indirect activities, (see paragraphs 26 to 28 of the Guidelines); and
- (7) for the purposes of paragraph 6(1)(c)(ii) above, “qualifying indirect activities” are limited to certain specified activities which form part of a project but do not directly contribute to the resolution of the scientific or technological uncertainty, including:
- (a) scientific and technical information services, insofar as they are conducted for the purpose of R&D support (such as the preparation of the original report of R&D findings); and

(b) indirect supporting activities such as maintenance, security, administration and clerical activities, and finance and personnel activities, insofar as undertaken for R&D,

(see paragraphs 31 and 32 of the Guidelines).

PROCEDURAL MATTER

7. Before turning to address the substantive issues in this appeal, I need first to record a significant case management decision which fell to be made at the hearing. This arose as follows.

8. On 11 November 2020, the First-tier Tribunal issued comprehensive directions in relation to the proceedings in this case. Paragraph 2 of those directions required each party, by no later than 11 December 2020, “to send or deliver to the other party statements from all witnesses on whose evidence they intend to rely at the hearing setting out what that evidence will be (“witness statements”) and ...notify the Tribunal that they have done so”.

9. Notwithstanding the clear and unequivocal terms of this direction, the Appellant did not send any witness statements to the Respondents prior to the start of the hearing. Instead, it became apparent at the hearing that the Appellant’s representative, Haines Watts, had:

(1) sent a witness statement from Mr Webber to the First-tier Tribunal (but not the Respondents) on 9 April 2021 (some four months after the date by which the Appellant was required to serve that witness statement on the Respondents if it wished to rely on that witness statement at the hearing of the appeal); and

(2) sent three further witness statements – one from a representative of Halcyon and two from alleged experts in digital learning, a Dr Ian Kenny and Dr Tim Coughlan – to the First-tier Tribunal (but not the Respondents) on 13 September 2021 (just three days before the hearing and some nine months after the date by which the Appellant was required to serve those witness statements on the Respondents if it wished to rely on those witness statements at the hearing of the appeal).

10. Accordingly, none of the four witness statements described above had been sent to the Respondents prior to the hearing and the Respondents were not even aware prior to the hearing that the Appellant was proposing to adduce any witness evidence at the hearing.

11. When Mr Hickey-Baird became aware, at the hearing, of the existence of the relevant witness statements, he, unsurprisingly, submitted that the Appellant should not be permitted to introduce them as evidence at the hearing without making a prior formal application to do so, to which application he would object on behalf of the Respondents. Mr Scott duly made that application on behalf of the Appellant.

12. In considering the application, I took into account the overriding objective of proceedings before the First-tier Tribunal, as outlined in Rule 2 of the Tribunal Procedure (First-tier Tribunal) (Tax Chamber) Rules 2009 (the “Tribunal Rules”), which is to deal with cases fairly and justly, and to the specific matters mentioned in Rule 2(2) of the Tribunal Rules. The difficulty posed by the application to admit the relevant witness evidence in this instance was that, on the one hand, without its admission, it was highly unlikely that the Appellant would be able to satisfy the burden of proving that the expenditure in this case satisfied the terms of the Guidelines and would therefore necessarily limit the extent of my consideration of the case. That suggested that it would not be fair or just to the Appellant to deny it the opportunity to introduce the evidence in question. On the other hand, I considered that it would not be fair or just to the Respondents to allow the Appellant to introduce the evidence at the hearing without having given prior notice to that effect to the Respondents in advance of the hearing because, by acting in that manner, the Appellant had prevented the Respondents from giving proper

consideration to the relevant evidence and, critically, whether or not they wished to cross-examine any or all of the witnesses.

13. One obvious solution to these conflicting requirements would have been to postpone the proceedings, in order to enable the process described above to take place. However, I considered that that course of action would also not be fair or just to the Respondents. The Respondents had served their statement of case on the Appellant on 14 February 2020, a considerable period of time before the hearing, and that statement of case had clearly set out both the concerns held by the Respondents in relation to the ability of the expenditure in question to fall within the ambit of the Guidelines and the fact that the onus was on the Appellant to discharge those concerns. It ought therefore to have been very clear to the Appellant for some considerable time before the hearing:

- (1) what issues it was going to have to address at the hearing; and
- (2) the fact that the onus would be on it to satisfy the First-tier Tribunal in relation to those issues.

14. It ought also to have been very clear to the Appellant that satisfying the First-tier Tribunal in relation to those issues was going to require evidence from:

- (1) Mr Webber, as the director of the Appellant and the person who commissioned the work by Halcyon, who would be able to explain the underlying purpose of the expenditure and the nature of the task which he was requiring Halcyon to perform;
- (2) a representative of Halcyon, who would be able to explain the precise nature of the work carried out by Halcyon at the Appellant's behest and therefore demonstrate why that work amounted to an advance in science or technology; and
- (3) competent professionals in the field to which the expenditure related, who would be able to explain why the work carried out by Halcyon involved an advance in overall knowledge or capability in a field of science or technology and directly contributed to that advance through the resolution of scientific or technological uncertainty.

15. Indeed, Mr Scott candidly admitted at the hearing that, if the Respondents had agreed to make available their software R&D specialists for a meeting with the Appellant as sought by the Appellant during the period of the enquiry – as to which, see paragraph 24 below – the Appellant would have had to adduce evidence from all of the above people at that meeting in order to persuade the Respondents of its case. That being so, I consider that the Appellant ought to have been aware that it was going to have produce the same witnesses at the hearing in order to persuade the First-tier Tribunal of its case.

16. Given the above, it is simply inexplicable that the Appellant did not follow the procedure set out in the direction mentioned in paragraph 8 above. There was nothing ambiguous about the scope of that direction.

17. The injunction in Rule 2 of the Tribunal Rules to deal with cases fairly and justly entails being fair and just in relation to both parties and not merely in relation to the appellant. In the circumstances, I concluded at the hearing that the fair and just approach in this case would be to continue with the hearing but refuse to allow the witness evidence in question to be admitted.

FACTS

18. As I have already mentioned, the absence of witness evidence has made it very difficult for me to ascertain with any degree of precision the nature of the work carried out by Halcyon at the behest of the Appellant. I have had to rely entirely on:

- (1) the R&D report by Haines Watts, set out at pages 171 to 183 of the DB;

- (2) the note of a meeting between the parties held on 12 March 2019, set out at pages 126 and 127 of the DB;
- (3) letters from Mr Sean Stone of the Respondents to Haines Watts dated 30 November 2018, 29 March 2019 and 12 July 2019, set out at pages 125, 128, 129, 133 and 134 of the DB; and
- (4) emails from Ms Sara Andrews of Haines Watts to Mr Stone dated 25 June 2019 and 8 July 2019, set out at pages 130 to 132 of the DB.

19. Based on those documents, my findings of fact in relation to this appeal are as follows:
- (1) the purpose of the Appellant in incurring the expenditure was to develop a platform to assist learners in finding learning services best-suited to their needs – in effect, a “sat-nav for learning”;
 - (2) that platform was not intended to contain learning content itself. Instead, it was intended to use a learner’s prior experience and learning goal to identify the most appropriate learning content;
 - (3) the platform was very different from any other learning platform available on the market and has not yet been completed. It is in an ongoing state described by the Appellant as “permanent beta” where there is no end to discovering new ways in which the platform can be improved; and
 - (4) the platform involved the creation of new pathways, as opposed simply to gathering up pathways from other learning platforms. Whereas other learning platforms are constrained by the existing formal education curricula, so that the coding required to bring an individual to a specific subject area is a single pre-defined pathway, the Appellant’s platform took into account the learner’s experience and specific learning goal and also a broader category of content, including informal education paths, to bring the individual to a specific subject area. As such, it did not involve a single pre-defined pathway and instead introduced a novel multi-pathway approach to identifying the most appropriate learning pathway.

20. In my view, it is wholly unclear from those documents whether the creation of the platform described in paragraph 19 above involved the creation of new technology which was designed to resolve a scientific or technological uncertainty or was no more than a novel utilisation of existing technology or an adaptation of existing technology, and, in the latter case, whether that adaptation was readily deducible by a competent professional working in the field.

DISCUSSION

21. There is no dispute between the parties in relation to either:
- (1) the validity of the process pursuant to which the closure notice to which this appeal relates was issued; or
 - (2) the satisfaction of any of the conditions for the relief to be available apart from whether or not the expenditure in question was “attributable to relevant research and development undertaken on behalf of the company” (as mentioned in Section 1053(2) of the CTA 2009); or
 - (3) the manner in which the Appellant has quantified the relief, assuming that all of the expenditure did meet that condition.
22. The Appellant accepts that the enquiry which led to the assessment was validly opened and that the closure notice which brought that enquiry to an end was validly issued.

23. For their part, the Respondents accept that, if all of the expenditure to which this appeal relates was “attributable to relevant research and development undertaken on behalf of the company” (as mentioned in Section 1053(2) of the CTA 2009), then:

- (1) each of the other conditions which need to be satisfied before the relief can be claimed are so satisfied; and
- (2) the Appellant has used the correct method for calculating the relief.

24. Notwithstanding paragraphs 21(1) and 22 above, Mr Scott indicated at the hearing that the Appellant was unhappy with the manner in which the Respondents had conducted themselves in relation to this matter. He said that the Appellant considered that the Respondents should have been represented at the meeting on 12 March 2019 by the software R&D specialists within the Respondents who were ultimately responsible for the rejection of its claim and not merely by Officer Stone. However, this is not a challenge to the validity of the process as such. It is instead a complaint as to the conduct of the Respondents in the course of the enquiry and that is outside the scope of my jurisdiction in this case.

25. As such, the only issue which I need to determine in this decision is whether all, or an identifiable part of, the expenditure to which this appeal relates was “attributable to relevant research and development undertaken on behalf of the company” (as mentioned in Section 1053(2) of the CTA 2009). In that regard, given the terms of the Guidelines, I need to determine whether the Appellant has satisfied the burden of proving that, on the balance of probabilities:

- (1) the expenditure, or at least an identifiable part of the expenditure, was incurred in the course of a project which sought to achieve an advance in science and technology; and
- (2) the activities to which the expenditure, or the identifiable part of the expenditure, related either directly contributed to achieving that advance through the resolution of scientific or technological uncertainty or amounted to qualifying indirect activities.

26. The Respondents submit that the Appellant has not satisfied that burden of proof. They say that:

- (1) first, the Appellant has not established that the expenditure in this case was incurred with the intention of resolving a scientific or technological uncertainty (and, hence, with the intention to make a scientific or technological advance), as opposed to being incurred with the intention of making a novel use of existing technology or adapting existing technology in a manner which was readily deducible by a competent professional working in the field. They accept that the platform proposed by the Appellant was different from other platforms available in the market but they say that the Appellant has not identified the scientific or technological uncertainty which the proposed platform was intended to overcome or established how the proposed platform was intended to address that uncertainty. They say that the mere fact that the Appellant’s proposed platform offered additional functionality does not demonstrate either of these things. A novel or innovative approach to the application of existing technology is insufficient to justify a claim for the relief. Instead, there needs to be an advance in the technology itself. In addition, even though work on combining standard technologies can involve a resolution of a technological uncertainty if that combination is not readily deducible by a competent professional working in the field, the Appellant has provided no evidence to that effect from a competent professional working in the field;

- (2) secondly, the expenditure in this case was not incurred in the course of a “project”, as is required by the Guidelines, in that the Appellant has described the platform as being

in a “permanent beta” state. In other words, the Appellant has provided no evidence of the existence of a plan to overcome an alleged uncertainty, with a start date and an end date, but has instead asserted that the proposed new platform can be continually improved;

(3) thirdly, they have not been provided with any original contracts between the Appellant and Halcyon, invoices from Halcyon or evidence from anyone at Halcyon to identify the exact nature of the work commissioned by the Appellant. It is therefore impossible to know exactly what Halcyon was asked to do, whether what it was asked to do was to overcome a technological uncertainty and, if so, how much of Halcyon’s work was attributable to that purpose; and

(4) finally, the Appellant has provided no evidence from a competent professional in the field to speak with authority on various relevant matters, such as the nature of the technological uncertainty which the work was intended to resolve or the technological advance to which the work would give rise.

27. The Appellant has responded to these challenges by saying that:

(1) first, the work carried out by Halcyon was a “project” in that the objective was to advance the educational and digital learning space by developing new technology. There was thus an area of technological uncertainty which the project sought to resolve and the objective was to make an advance in overall knowledge or capability in a field of technology. It was true that, in the course of the project, the Appellant had used some software platforms which already existed but that was merely in order to gather data. The aim of the project was to develop new software. This was not a case involving additional functionality or a novel approach to the application of existing technology. Instead, it involved an increase in overall knowledge or capability in technology;

(2) secondly, the witness statement of the representative of Halcyon explained why the work carried out by Halcyon involved the resolution of a scientific or technological uncertainty and hence involved a scientific or technological advance;

(3) thirdly, the witness statements of Dr Kenny and Dr Coughlan, two respected experts in the field of digital learning, explained that the work did not involve a combination of technologies which was readily deducible by a competent professional in the field; and

(4) finally, the Respondents had never asked the Appellant to provide copies of the original contracts between the Appellant and Halcyon or invoices from Halcyon. In any event, so far as the invoices were concerned, the language used in those invoices was generic and would not have advanced the debate even if the invoices had been provided.

28. It will by now be apparent that, without having heard the evidence of any witnesses, it is impossible for me to find in favour of the Appellant in this appeal. The burden of proof is on the Appellant to establish that all, or an identifiable part, of the expenditure was incurred on work which sought to resolve a technological uncertainty and thereby achieve an advance in science and technology. The Appellant has said in its submissions that it did satisfy these criteria but this is mere assertion. It has provided no proof to that effect. The known facts are compatible with both the satisfaction of the criteria and also a failure to satisfy those criteria. In other words, it is perfectly possible from the facts which I have found that the work carried out by Halcyon at the behest of the Appellant was no more than a novel utilisation of the existing technology in this area or an adaptation of that existing technology which was readily deducible by a competent professional working in the field. It is far from clear that the work

involved the resolution of a scientific or technical uncertainty or an advance in science or technology, as defined in the Guidelines.

29. In order to satisfy the burden of proof, the Appellant would have needed to provide witnesses who could have testified to the facts necessary for me to conclude that the criteria set out in the Guidelines were satisfied and who could then have been subjected to cross-examination by the Respondents. In the absence of that, I am unable to conclude that, on the balance of probabilities, the expenditure in question satisfied the relevant criteria. For example, although the four categories described in paragraph 9 of the Guidelines are not exhaustive, based on the facts which are known to me, it is wholly unclear whether the present facts fall within any of those categories.

30. I therefore dismiss the appeal.

RIGHT TO APPLY FOR PERMISSION TO APPEAL

31. This document contains full findings of fact and reasons for the decision. Any party dissatisfied with this decision has a right to apply for permission to appeal against it pursuant to Rule 39 of the Tribunal Rules. The application must be received by this Tribunal not later than 56 days after this decision is sent to that party. The parties are referred to “Guidance to accompany a Decision from the First-tier Tribunal (Tax Chamber)” which accompanies and forms part of this decision notice.

**TONY BEARE
TRIBUNAL JUDGE**

RELEASE DATE: 23 SEPTEMBER 2021

THE APPENDIX

RELEVANT PROVISIONS OF THE GUIDELINES

“THE DEFINITION OF RESEARCH & DEVELOPMENT”

3. R&D for tax purposes takes place when a **project** seeks to achieve an **advance in science or technology**.
4. The activities which directly contribute to achieving this advance in science or technology through the resolution of scientific or technological uncertainty are R&D.
5. Certain **qualifying indirect activities** related to the project are also R&D. Activities other than qualifying indirect activities which do not directly contribute to the resolution of the project’s scientific or technological uncertainty are not R&D...

ADVANCE IN SCIENCE OR TECHNOLOGY

6. An advance in science or technology means an advance in overall knowledge or capability in a field of science or technology (not a company’s own state of knowledge or capability alone). This includes the adaptation of knowledge or capability from another field of science or technology in order to make such an advance where this adaptation was not readily deducible.
7. An advance in science or technology may have tangible consequences (such as a new or more efficient cleaning product, or a process which generates less waste) or more intangible outcomes (new knowledge or cost improvements, for example).
8. A process, material, device, product, service or source of knowledge does not become an advance in science or technology simply because science or technology is used in its creation. Work which uses science or technology but which does not advance scientific or technological capability as a whole is not an advance in science or technology.
9. A project which seeks to, for example,
 - (a) extend overall knowledge or capability in a field of science or technology; or
 - (b) create a process, material, device, product or service which incorporates or represents an increase in overall knowledge or capability in a field of science or technology; or
 - (c) make an **appreciable improvement** to an existing process, material, device, product or service through scientific or technological changes; or
 - (d) use science or technology to duplicate the effect of an existing process, material, device, product or service in a new or appreciably improved way (e.g. a product which has exactly the same performance characteristics as existing models, but is built in a fundamentally different manner)will therefore be R&D.
10. Even if the advance in science or technology sought by a project is not achieved or not fully realised, R&D still takes place.

11. If a particular advance in science or technology has already been made or attempted but details are not readily available (for example, if it is a trade secret), work to achieve such an advance can still be an advance in science or technology.

12. However, the routine analysis, copying or adaptation of an existing product, process, service or material, will not be an advance in science or technology.

SCIENTIFIC OR TECHNOLOGICAL UNCERTAINTY

13. Scientific or technological uncertainty exists when knowledge of whether something is scientifically possible or technologically feasible, or how to achieve it in practice, is not readily available or deducible by a competent professional working in the field. This includes system uncertainty. Scientific or technological uncertainty will often arise from turning something that has already been established as scientifically feasible into a cost-effective, reliable and reproducible process, material, device, product or service.

14. Uncertainties that can readily be resolved by a competent professional working in the field are not scientific or technological uncertainties. Similarly, improvements, optimisations and fine-tuning which do not materially affect the underlying science or technology do not constitute work to resolve scientific or technological uncertainty.

OTHER DEFINITIONS

Science

15. Science is the systematic study of the nature and behaviour of the physical and material universe. Work in the arts, humanities and social sciences, including economics, is not science for the purpose of these Guidelines. Mathematical techniques are frequently used in science, but mathematical advances in and of themselves are not science unless they are advances in representing the nature and behaviour of the physical and material universe.

16. These Guidelines apply equally to work in any branch or field of science.

Technology

17. Technology is the practical application of scientific principles and knowledge, where ‘scientific’ is based on the definition of science above.

18. These Guidelines apply equally to work in any branch or field of technology.

Project

19. A project consists of a number of activities conducted to a method or plan in order to achieve an advance in science or technology. It is important to get the boundaries of the project correct. It should encompass all the activities which collectively serve to resolve the scientific or technological uncertainty associated with achieving the advance, so it could include a number of different sub-projects. A project may itself be part of a larger commercial project, but that does not make the parts of the commercial project that do not address scientific or technological uncertainty into R&D.

Overall knowledge or capability

20. Overall knowledge or capability in a field of science or technology means the knowledge or capability in the field which is publicly available or is readily deducible from the publicly available knowledge or capability by a competent professional working in the field. Work which seeks an advance relative to this overall knowledge or capability is R&D.

21. Overall knowledge or capability in a field of science or technology can still be advanced (and hence R&D can still be done) in situations where

- several companies are working at the cutting edge in the same field, and are doing similar work independently; or
- work has already been done but this is not known in general because it is a trade secret, and another company repeats the work; or
- it is known that a particular advance in science or technology has been achieved, but the details of how are not readily available.

22. However, the routine analysis, copying or adaptation of an existing process, material, device, product or service will not advance overall knowledge or capability, even though it may be completely new to the company or the company's trade.

Appreciable improvement

23. Appreciable improvement means to change or adapt the scientific or technological characteristics of something to the point where it is 'better' than the original. The improvement should be more than a minor or routine upgrading, and should represent something that would generally be acknowledged by a competent professional working in the field as a genuine and non-trivial improvement. Improvements arising from the adaptation of knowledge or capability from another field of science or technology are appreciable improvements if they would generally be acknowledged by a competent professional working in the field as a genuine and non-trivial improvement.

24. Improvements which arise from taking existing science or technology and deploying it in a new context (e.g. a different trade) with only minor or routine changes are not appreciable improvements. A process, material, device, product or service will not be appreciably improved if it simply brings a company into line with overall knowledge or capability in science or technology, even though it may be completely new to the company or the company's trade.

25. The question of what scale of advance would constitute an appreciable improvement will differ between fields of science and technology and will depend on what a competent professional working in the field would regard as a genuine and non-trivial improvement.

Directly contribute

26. To directly contribute to achieving an advance in science or technology, an activity (or several activities in combination) must attempt to resolve an element of the scientific or technological uncertainty associated with achieving the advance.

27. Activities which directly contribute to R&D include:

- (a) activities to create or adapt software, materials or equipment needed to resolve the scientific or technological uncertainty, provided that the software, material or equipment is created or adapted solely for use in R&D;
- (b) scientific or technological planning activities; and
- (c) scientific or technological design, testing and analysis undertaken to resolve the scientific or technological uncertainty.

28. Activities which do not directly contribute to the resolution of scientific or technological uncertainty include:

- (a) the range of commercial and financial steps necessary for innovation and for the successful development and marketing of a new or appreciably improved process, material, device, product or service;
- (b) work to develop non-scientific or non-technological aspects of a new or appreciably improved process, material, device, product or service;
- (c) the production and distribution of goods and services;
- (d) administration and other supporting services;
- (e) general support services (such as transportation, storage, cleaning, repair, maintenance and security); and
- (f) qualifying indirect activities.

System uncertainty

29. System uncertainty is scientific or technological uncertainty that results from the complexity of a system rather than uncertainty about how its individual components behave. For example, in electronic devices, the characteristics of individual components or chips are fixed, but there can still be uncertainty about the best way to combine those components to achieve an overall effect. However, assembling a number of components (or software sub-programs) to an established pattern, or following routine methods for doing so, involves little or no scientific or technological uncertainty.

30. Similarly, work on combining standard technologies, devices, and/or processes can involve scientific or technological uncertainty even if the principles for their integration are well known. There will be scientific or technological uncertainty if a competent professional working in the field cannot readily deduce how the separate components or sub-systems should be combined to have the intended function.

Qualifying indirect activity

31. These are activities which form part of a project but do not directly contribute to the resolution of the scientific or technological uncertainty. They are:

- (a) scientific and technical information services, insofar as they are conducted for the purpose of R&D support (such as the preparation of the original report of R&D findings);
- (b) indirect supporting activities such as maintenance, security, administration and clerical activities, and

finance and personnel activities, insofar as undertaken for R&D; (c) ancillary activities essential to the undertaking of R&D (e.g. taking on and paying staff, leasing laboratories and maintaining research and development equipment including computers used for R&D purposes);

(d) training required to directly support an R&D project;

(e) research by students and researchers carried out at universities;

(f) research (including related data collection) to devise new scientific or technological testing, survey, or sampling methods, where this research is not R&D in its own right; and

(g) feasibility studies to inform the strategic direction of a specific R&D activity.

32. Activities not described in paragraph 31 are not qualifying indirect activities.”