Australian Government
Department of Industry, Science, Energy and Resources

AusIndustry
R&D Tax Incentive

Manufacturing and the R&D Tax Incentive

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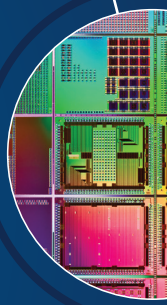

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How to use this Guide

The R&D Tax Incentive programme provides an incentive for companies performing eligible research and development (R&D). The programme is legislated and the rules appear in the legislation[1].

What does this guide do?

Research and development is particularly important for manufacturing companies. The sector in Australia faces well publicised challenges and innovation is central to ensuring it continues to be an important part of the economy.

As the market, both in Australia and internationally, continues to demand the development and manufacture of new and innovative products, the importance of the R&D Tax Incentive to local companies will only increase.

This guide helps clarify how to self-assess the eligibility of manufacturing R&D activities.

A series of examples show how to identify what eligible R&D might be and how to register eligible R&D activities.

No single example (or set examples) can represent the multiple combinations of company structures, operations, management, record keeping systems and expenditure. However, the business scenarios chosen attempt to broadly examine some highlighted issues identified as facing the manufacturing industry and at various points in a business R&D cycle. These issues were identified during consultation with business, industry representatives and tax agents.

While they follow the same format, the focus of each example is different. Through this mix, the Department of Industry, Innovation and Science (the department) has aimed to illuminate the range of issues that arose during close consultation with the manufacturing sector.

In addition, the department provides information on the R&D Tax Incentive that highlights issues relevant to the manufacturing sector through business.gov.au and the *R&D Tax Incentive Information eBulletin*. This edition of the guide replaces the [2013] edition.

If your company is spending money to experimentally solve technical problems or experimentally develop new products or services, you may be undertaking some activities that qualify as R&D under the Incentive. The examples in the Guide [2] address key eligibility requirements such as:

- new knowledge,

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1 See, division 355 of the *Income Tax Assessment Act 1997*. The definitions of eligible R&D activities are contained in sections 355-20, 25 and 30 of that Act.

[2] The examples used in this guidance are fictional examples created to illustrate application of the R&D Tax Incentive to hypothetical commercial enterprises. The examples reflect the department's experience with jointly administering the programme with the Australian Taxation Office. No similarity of the examples to existing enterprises or projects is intended.

- experimental process,
- core and supporting R&D activities,
- records management and compliance assurance,
- excluded activities, and
- activities likely to be ineligible.[3]

These concepts are incorporated throughout the guide with clear examples to highlight the issues. Commentary is also provided at the end of each example to direct companies to the important linkages to other guidance that has already been published to assist companies to de-risk their participation in the programme and evaluate their own 'compliance readiness'.

This guidance should be used in conjunction with the *R&D Tax Incentive*: *A Guide to Interpretation* which is available on the business.gov.au website.

Why is it important to use this guide?

This guide will assist companies and tax advisors to understand the eligibility requirements that apply to activities that are supported under the R&D Tax Incentive. Following this guide will:

- enable companies to self-assess and register eligible R&D, and
- help companies avoid:
  - compliance reviews, which may involve additional legal fees and tax agent fees, and
  - potential repayment of the tax benefit.

What is eligible R&D?

Eligible R&D is defined in the legislation. Companies self-assess whether their activities are eligible R&D activities before registering under the programme.

R&D Activities

Under the R&D Tax Incentive, R&D activities must either be:

- **Core R&D activities.** These are systematic, hypothesis-driven experimental activities with an unknown outcome and based on the principles of established science, undertaken to generate new knowledge (including new knowledge in the form of new or improved materials, products, devices, processes or services), or
- **Supporting R&D activities.** These are activities that are not part of the experimental activities, but directly support them.

Registration

The programme is accessed by registering self-assessed R&D activities with the department (this must be done within 10 months of the end of the company's income

[3] See page 8 for summaries of the examples that show these concepts.

year) and claiming for eligible expenses relating to the registered activities in the company's tax return.[4]

Companies applying to register for the R&D Tax Incentive must self-assess their activities against the legislated eligibility criteria. When a registration is accepted this does not mean that the registered activities have been determined to be eligible. The department routinely examines registrations in detail for compliance and may contact companies for further information.

The department applies the programme's legislative requirements during its registration and compliance processes and will do so as set out in its guidance. Registering companies must maintain adequate records that can allow self-assessment by substantiating the eligibility of R&D activities. Companies must ensure expenditure claimed for R&D activities is based on genuine financial records, as is the case for any element of their tax return.

Companies may choose to use an R&D tax advisor to help prepare applications and registrations. However, the use of an R&D tax advisor is not a requirement of entry into any departmental programme and using the services of an R&D tax advisor to assist with the preparation of a registration application and offset claim does not guarantee eligibility. Companies wishing to get an assurance whether particular activities they are currently conducting, or are intending to conduct, are eligible R&D activities may apply to the department for an Advance Finding.

Eligibility must be self-assessed for activities, not for whole projects.

Companies and advisors also need to be aware of expenditure that is ineligible under the R&D Tax Incentive. This includes:

- interest expenditure (within the meaning of interest in the withholding tax rules),
- expenditure that is not at risk,
- core technology expenditure, and
- expenditure included in the cost of a depreciating asset (decline in value notional deductions may apply however).

Note: Readers with questions about the eligibility of expenditure items on R&D activities registered under the R&D Tax Incentive should consult the ATO through its website at ato.gov.au/business/research-and-development-tax-incentive/, by phone on 13 28 66 (for businesses) or 13 72 86 (for tax agents).

Other relevant publications

R&D Tax Incentive: A Guide to Interpretation – this document provides companies with the government's interpretation of the legislative requirements of the programme, including a detailed overview of core and supporting R&D activities. In addition, there are checklists and examples of activities unlikely to meet the programme requirements.

[4] Information on the benefits available through the programme and the registration application form are available on business.gov.au.

Compliance Readiness

The department has released guidance to help companies that intend to register for the R&D Tax Incentive to ensure that they are 'compliance ready'[5]. Compliance readiness means having in place the systems and processes to identify, evaluate and record eligible R&D activities and expenditure on those activities. First-time participants in the programme should seek assistance from the department to make sure they understand the programme's requirements.

The following set of principles is suggested to assist companies in developing appropriate systems and processes to document their R&D activities and associated expenditure. It is important to note that the first step to ensuring compliance is reviewing and understanding the R&D Tax Incentive guidelines and requirements.

These principles have been informed by the department's experience in conducting compliance assurance activities. The principles also take into account key Administrative Appeals Tribunal decisions, where failures in a company's or tax agent's assessment of eligible R&D activities resulted in tax claims for R&D being overturned.

Maintaining contemporaneous documentation that demonstrates eligibility under the programme is essential. Companies cannot establish eligibility without maintaining detailed documentation that records the process of each activity as it develops.

Principle 1

Ensure that internal processes and systems allow for documentation of how activities meet eligibility requirements as part of the overall project planning and management process.

Principle 2

Identify and document eligible R&D activities at the time they are conducted – this improves the potential to capture associated costs in real time.

Principle 3

Document methods for identifying eligible R&D activities and recording expenditure associated with eligible activities. This ensures that there is a clear understanding of how information has been derived and enables the process to be repeated in future years.

Principle 4

Forge strong connections between those responsible for preparing and maintaining R&D Tax Incentive records and staff who understand the technical aspects of activities to enable a shared understanding of programme requirements.

Principle 5

Ensure that strong links have been established between activity and expenditure records.

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[5] *Compliance Readiness – Importance of Record Keeping* and *Compliance Readiness – Risk Review and Findings* are available on business.gov.au.

The Examples

Projects to develop new products or services undertaken by companies are generally comprised of activities. Eligibility under the R&D Tax Incentive cannot be self-assessed at the project level. The legislation governing the programme requires eligibility to be assessed at the level of the activities within the project.

The examples in this document illustrate the eligibility requirements of the programme in the context of activities being conducted in hypothetical business scenarios.

Table 1 provides the reader with an idea of the level of detail contained in the examples on particular concepts.

Example 1 – InnovateChips (Page 10)

Scenario

Development of a carbon nanotube transistor.

R&D Tax Incentive Principles

This example illustrates the application of key definitions such as **core** and **supporting R&D activities**, and shows how the company self-assessed and registered for the R&D Tax Incentive.

Example 2 – PoolZapper (Page 16)

Scenario

Development of a new chlorination cell for domestic pools.

R&D Tax Incentive Principles

This example shows a company engaging with a **Research Service Provider** to access specialist R&D expertise. In particular, this example examines how the identification and management of eligible R&D activities in a **production environment** can satisfy the **dominant purpose** requirement of the legislation.

Example 3 – BuzzBirds (Page 22)

Scenario

Incremental product development in the manufacture of an interactive toy.

R&D Tax Incentive Principles

This example explores the eligibility conditions for an **Advance/Overseas Finding** including its four key requirements.

Example 4 – Rutimech (Page 28)

Scenario

Modification of a small batch production process that produces custom titanium alloys in powder form.

R&D Tax Incentive Principles

This example addresses R&D in **scale-up** activities, the **separation of core and supportin**g and the **transition** to normal production.

TABLE 1 · This table demonstrates a range of relevant issues for companies and their treatment in each of the examples

KEY CONCEPT	**EXAMPLE 1** InnovateChips	**EXAMPLE 2** PoolZapper	**EXAMPLE 3** BuzzBirds	**EXAMPLE 4** Rutimech
Core R&D activity definition	■	◆	◆	◆
Supporting R&D activity definition	■	◆	◆	◆
Supporting R&D activity – dominant purpose	■	●	◆	
Example of activities that are neither core nor supporting		■		●
Record Keeping	■	◆	◆	◆
Grouping R&D activities	■			
Overseas Finding			■	
Feedstock		●		■
R&D in a production environment		■		
R&D in scale-up activities – separation of core and supporting			■	
Transition from R&D to normal production – dominant purpose				●

■ Concept explored in the example and an expanded explanation given in the commentary

◆ Concept explored in the example

● Concept explored in the commentary section

Note that the following issues are administered by the ATO:

- Feedstock adjustment
- Clawback adjustment

Example 1: InnovateChips

This example applies the key legislative requirements.

This example illustrates the application of key definitions such as **core** and **supporting R&D activities**, and shows how the company self-assessed and registered for the R&D Tax Incentive.

The example also highlights the importance of good **record keeping** and provides commentary on the types of records that should be kept to ensure compliance with the R&D Tax Incentive.

Business Scenario

InnovateChips is a medium-sized Australian company that specialises in the design and development of high-performance semiconductors that are used in computer processors, mobile phones and other technologies.

The company has a track record of developing new semiconductor products through incremental improvement. Recently, the R&D manager advised the company's Board that its competitors were exploring next generation materials as a replacement to silicon transistors. The research was focused on carbon nanotube transistors because of the potential to provide faster processor speeds with lower power consumption.

Intrigued by the potential of this research but aware that much more work needed to be done before it was viable, InnovateChips embarked upon an initial programme of work that aimed to:

1. isolate semiconducting carbon nanotubes from metallic varietal, and
2. untangle the separated nanotubes.

Subsequently InnovateChips began an R&D project to develop carbon nanotube transistors. After considering the department's guidance material on the business.gov.au website, InnovateChips self-assessed the activities it was conducting in its project and registered two core R&D activities and two supporting R&D activities.

Core R&D Activity 1:

Separating semiconducting carbon nanotubes from metallic varietals and preventing entangling

Carbon nanotubes exist in both metallic and semiconducting forms. InnovateChips needed to identify an effective separation method to isolate the semiconducting varietals as well as a method to untangle the carbon nanotubes after separation and prevent further tangling. Carbon nanotubes have a natural tendency to form into rope structures and they exhibit a high degree of entanglement.

InnovateChips designed and ran hypothesis-driven experiments that tested different separation methods using a variety of chemicals. The results were evaluated and the purity and degree of tangling were compared. The company discovered that the addition of Liquid 651 during the preparation stages allowed the semiconducting nanotubes to be separated from the metallic elements by column chromatography. This technique gave a purity level of 99.9%.

InnovateChips turned to the second part of its experimental activities – developing a method for untangling the carbon nanotubes and inhibiting them from further tangling. InnovateChips considered that DNA techniques, that used polymer micro hooks to grip DNA strands and the focused application of lasers on the hooks to untangle the strands, might be effective in untangling carbon nanotubes. The company conducted experiments with carbon nanotubes and a range of these DNA techniques to test hypotheses about untangling the nanotubes.

InnovateChips self-assessed that the experiments conducted to develop the purifying and untangling processes were eligible core R&D activities[6] as:

- the company could not identify any existing techniques to separate and untangle the carbon nanotubes despite its literature/web reviews and consultation with industry experts,
- the company could not determine how to untangle the carbon nanotubes through the knowledge, information and experience of competent professionals,
- the company conducted experiments based on scientific principles and used a systematic approach that proceeded from a hypothesis to experiment, observation and evaluation and led to a logical conclusion, and
- a significant purpose of the experiments was to generate new knowledge in the area of carbon nanotube separation and disentanglement.

When it registered for the R&D Tax Incentive, the company decided to group the two parts of the experimental activities as a single core activity. The company kept records that documented its rationale for registering the two parts of the activity as a single core activity including reasons why the two parts were so closely linked.

Supporting R&D Activity 1:

Developing the experimental process

The company undertook literature and internet research to identify potential methods to separate carbon nanotubes from their metallic varietals and untangle the separated nanotubes. The company self-assessed that, while it was not a core R&D activity, the relevant aspects could be a supporting R&D activity. This assessment was made because some parts of this research was directly related to the core R&D activity because it informed the design and methodology of the experimental activities. However, not all of the research was eligible for inclusion in a supporting R&D activity and the company was careful to document which research it was claiming and its reasons for this assessment.

Core R&D Activity 2:

Testing carbon nanotube semiconductor chips

Having completed the first core R&D activity, InnovateChips still needed to discover whether carbon nanotubes could be used to create a working semiconductor chip. To do this, the company developed hypotheses and conducted experiments to test a batch of 100 prototype semiconductor chips to determine whether the technology

[6] The flow chart *Process for Identification of Core R&D Activities* is available on the business.gov.au website.

worked in principle and if so, to examine the performance and electrical characteristics of the technology in comparison to its existing chips.

The tests showed the new carbon nanotube semiconductor chip technology worked, and in comparison with the existing technology the nanotube semiconductor chip functioned reliably, delivered faster processing speeds, and required less power.

In a similar way to Core R&D Activity 1, InnovateChips self-assessed these experiments to be an eligible core R&D activity. This was because the company's research could not identify that carbon nanotubes have been used to create a working semiconductor chip. Further, the industry experts consulted by the company did not know nor could they determine whether the chips would perform. The company also assessed that its purpose for conducting the experiments was to generate new knowledge in the form of new carbon nanotube chips.

Supporting R&D Activity 2:

Manufacture of the prototype carbon nanotube semiconductor chip

InnovateChips used its manufacturing line to produce the 100 prototype carbon nanotube semiconductor chips to test the performance of the carbon nanotubes in circuitry.

InnovateChips self-assessed that this activity was not a core R&D activity as the process of manufacturing semiconductors was well known and the company believed the inclusion of carbon nanotube circuitry didn't present any additional complexity or uncertainty. Consequently, there was no need for InnovateChips to design and undertake experiments to produce the prototypes.

The manufacture of the prototypes progressed as InnovateChips expected and the company did not encounter any problems that couldn't be resolved by its staff using currently available expert knowledge, information and experience. InnovateChips reviewed the department's guidance and self-assessed that the manufacture of the prototype semiconductor chips could be a supporting R&D activity as it was directly related to the core R&D activity that tested the semiconductor chips.

InnovateChips knew that as this activity would produce goods in the form of the chips the dominant purpose test would apply. This meant that, in order to be eligible as a supporting R&D activity, the activity also needed to have been undertaken for the dominant purpose of supporting a core R&D activity.

InnovateChips self-assessed that the activity satisfied the dominant purpose test[7] as the prototype semiconductor chips were manufactured solely for use in the experiments and were not made available for sale or otherwise used by the company.

[7] Further information on the dominant purpose test is available on business.gov.au in the:

1. *Customer Information Guide* (p 12)
2. *R&D Tax Incentive: A Guide to Interpretation* (p 20).

What documentation did InnovateChips keep?

It is important to maintain records to demonstrate to the department and the Australian Taxation Office (ATO) that:

- an eligible R&D activity was conducted,
- the company incurred eligible expenditure in relation to those activities, and
- the R&D activities and claimed expenditure met all legislative requirements under the programme.

To enable InnovateChips to substantiate its claim, the company maintained documents that demonstrated:

- the current state of knowledge that existed before the R&D activity commenced and what new knowledge was being sought,
- the knowledge or information that was needed was not already publicly available (literature/ internet review, patent searches and industry expert consultation),
- the knowledge needed was not able to be known or determined by a competent professional without conducting a hypothesis-driven experiment/s,
- its purposes for conducting the experiments,
- the experiments undertaken to discover the new knowledge, including the hypotheses, results, analysis and logical conclusions, and
- any changes to the hypotheses or experiments in the course of the R&D activity.

InnovateChips also kept:

- its email communications with scientists,
- lab reports,
- failure reports, and
- compiled tables comparing existing products in the market and the product in development.

In addition to this documentation the company provided a clear project plan[8], listing the activities to be conducted, the methodology of the experiments and the handling of results. The company also maintained receipts of purchases, logs of when the manufacturing line was used for conducting the supporting R&D activity and R&D staff working hours.

Good record management throughout its project allowed InnovateChips to provide clear and accurate descriptions of the activities in its R&D Tax Incentive registration, as well as preparing it for a compliance review if it were selected for one by the department.

Commentary

Core R&D activities

Companies must be able to substantiate that conducting experimental activities is required to generate the new knowledge that is needed. To do this, companies should focus on explaining how they determined that current knowledge and

[8] Maintaining formal R&D plans is not compulsory under the R&D Tax Incentive; however evidence of good planning and governance processes form strong supporting evidence for compliance purposes. Information on record keeping is available on business.gov.au in the *Compliance Readiness – Importance of Record Keeping* guide.

information from world-wide sources that were reasonably accessible by the company, could not be used by competent professionals to know or determine the new knowledge it needed. This can be demonstrated by undertaking and recording analysis or searches outside the company regarding the current state of knowledge (or state of the art) and documenting why this existing knowledge fails to provide an answer to the problem or a method for resolving it. This can include a broad range of information from sources like suppliers, research organisations, industry articles, blogs and wikis.

Supporting R&D activities

As seen in this example, activities that do not form part of the core R&D activities may still be eligible as supporting R&D activities. Supporting R&D activities must be directly related to a core R&D activity. To be directly related, an activity needs to have a direct, close and relatively immediate relationship with a core R&D activity. The R&D Tax Incentive: A Guide to Interpretation[9] contains information on the meaning and operation of 'directly related' (see page 10 of the Guide).

In this example, the company self-assessed that it could manufacture a prototype that incorporated new materials with its existing knowledge.

There may be other circumstances, for instance where a company manufacturing prototypes with new materials may encounter challenges that it is not able to resolve on the basis of existing knowledge, information or experience. Under these circumstances, as long as the experimental activities undertaken to generate the new knowledge satisfy the eligibility requirements, the company may choose to self-assess the activity as a core R&D activity.

Dominant Purpose

When assessing activities undertaken in a production environment for eligibility as supporting R&D activities it is necessary to demonstrate that the 'dominant purpose' is to support a core R&D activity. In determining the dominant purpose of an activity, consideration is given to the overall circumstances in which the activities are conducted.

It is possible that similar activities may be eligible in one context, but not in another. Companies need to consider:

- the extent to which the prospective supporting R&D activities also achieve commercial or production outcomes in addition to enabling the conduct of the core R&D activities, and
- the importance of those non-R&D outcomes.

At times companies may use their own production line to produce the supporting materials for the core R&D activity. In this situation it is especially important that companies keep good records. It is also important that companies keep and maintain good records that demonstrate they meet legislative requirements under the R&D Tax Incentive programme. If the prospective supporting R&D activity is occurring in

[9] The *R&D Tax Incentive: A Guide to Interpretation* is available on business.gov.au.

the production environment or is on the list of excluded core R&D activities[10], both the direct relationship test and the dominant purpose test must be satisfied.

Grouping of activities[11]

The decision of whether or not to group activities in a registration for the R&D Tax Incentive is one for each company to determine. It should be noted, however, that grouping complex activities that are not directly related to each other (for example multiple core activities that are not seeking to answer the same questions or including supporting activities as part of a core activity) may increase the risk of further compliance reviews being required.

The eligibility of each activity must be able to be self-assessed and substantiated, whether grouped together or not (cf *Mt Owen*[12]).

In this example, when registering its R&D activities with the department, InnovateChips provided a statement and record of the reasoning behind the company's self-assessment decisions (that is, the steps it took in order to establish the eligibility of the activities in its claim) and in particular, its approach to grouping the core R&D activities together.

[10] The list of excluded core R&D activities and commentary on their meaning may be found on page 25–40 of the *R&D Tax Incentive: A Guide to Interpretation* which is available on the business.gov.au website.

[11] The R&D Tax Incentive's *How Should Companies Group Activities* Specific Issue Guidance is available at business.gov.au.

[12] For a summary of the key points of this case, see https://www.business.gov.au/Assistance/Research-and-Development-Tax-Incentive/Administrative-Appeals-Tribunal-AAT-decisions/Mt-Owen-2013

Example 2: PoolZapper

This example shows the application of key definitions of the R&D Tax Incentive in a manufacturing business scenario.

The example shows a company engaging with a Research Service Provider (RSP) to access specialist R&D expertise. In particular, this example examines how the identification and management of eligible R&D activities in a production environment can satisfy the dominant purpose requirement of the legislation.

In this context, the example looks at R&D of a new product in a production environment and illustrates the importance of keeping documents to demonstrate:

- why the experimental activities were necessary, and
- the identification of where the application of new knowledge commences and the R&D activities end.

Business Scenario

PoolZapper is a medium sized Australian manufacturing company that produces salt water chlorination devices. These devices operate by passing a current through adjacent conductive plates immersed in pool water to produce sanitising agents. For the process to work effectively the plates need to be fully immersed in water with a relatively high water flow through them.

Over a number of years PoolZapper has made modifications to its chlorinator cells, which have focused on the reduction of the build-up of calcium and other minerals on the titanium plates. However, in the face of declining sales caused by the availability and popularity of energy efficient low water flow pumps, PoolZapper's directors decided that a significant technological improvement in their product was required to recapture its market share. The company realised that while it lacked the necessary technical expertise in-house, it was important that it invest in R&D and innovation.

PoolZapper discovered organisations called Research Service Providers[13] (RSPs) through business.gov.au that specialise in providing R&D services to companies. After researching RSPs, the company realised that certain expenditure on R&D – including through an RSP – could be eligible for a tax offset through the R&D Tax Incentive.

While PoolZapper could claim an R&D tax offset for eligible expenditure on this registered R&D activity, even if its total claim was less than the usual threshold of $20,000 in an income year, it still needed to ensure that the activities undertaken by the RSP met the eligibility requirements of core and supporting R&D activities.

[13] Information on Research Service Providers, including the contact details of current RSPs is available on the business.gov.au website.

Core R&D Activity 1:

Determining a new plate composition and catalyst

Working on behalf of PoolZapper the RSP began a planned series of experiments with different plate compositions and a variety of surface textures to increase the chlorination rate and compensate for the low water flow.

The RSP's approach was to focus on ways to maximise reactions by increasing the surface area of the plates. To do this the RSP developed hypotheses about prospective plate shape and texture that could be experimentally tested. Of particular interest were the various designs that involved cross pieces and dimpled surfaces. However, these proved to be unsuccessful as the cross pieces caused uneven current flow across the plates and micro turbulence produced by the dimples reduced the volume of pool water passing through the plates.

Undeterred, the RSP tried folding and arranging the plates to simulate parallel fractal patterns. In this approach the surfaces of the opposing plates were in effect 'intermeshed' but at an even distance apart. This approach facilitated an even flow of current between all parts of the plates.

Following these experiments, the RSP reported to PoolZapper that it had identified a new plate composition which appeared to produce better results than any previous models.

The RSP also developed a new catalyst that bound the calcium and other minerals away from the plates, reducing build-up and extending cell life. This was achieved by selecting a cohort of existing proton acid catalysts that, while unsuitable, were near matches for the physical lock and key shapes required to bind calcium and the undesirable minerals to other compounds common in pool water. The RSP then chemically bound the selected catalyst molecules to other molecules that altered the catalysts contact areas. The candidate catalysts were then tested for their ability to facilitate the chemical reactions to bind the waste products of the chlorination and other undesirable compounds typically found in pool water. This was continued until the RSP had produced the new catalyst that matched the design requirements.

Core R&D Activity 2:

Testing new plate and catalyst

PoolZapper needed to build on the discoveries made for it by the RSP. In particular, the company needed to test the level of chlorination the plates would produce under variable water flow rates and salt concentrations. PoolZapper also needed to test whether the action of the catalyst could clog the surface of the plates with calcium and other minerals.

PoolZapper consulted the RSP's experts and were advised that they did not know this information nor were they able to determine it on the basis of current knowledge, information or experience. For this reason PoolZapper was advised that the information could only be discovered by conducting further hypothesis-driven experiments.

Using the results of the earlier work produced by the RSP, PoolZapper constructed a number of prototype chlorinator cells using the new plate composition and catalyst.

The company then conducted the experiments on the prototype cells to determine the chlorination levels produced under variable water flow and salt concentrations. These experiments also measured and analysed any mineral build-up on the plates.

Supporting R&D Activity 1:

Manufacture of prototype chlorinator cells

In order to conduct the experiments PoolZapper required a number of prototype chlorinator cells to be manufactured with the new plates and catalyst. The company decided that the most cost effective method of manufacturing the small number of prototype cells required was to place the new plates in the normal production line feed and label the cells that were produced. The marked cells were then modified to include the catalyst.

PoolZapper self-assessed that the part of the production run that produced the prototype cells that were required to conduct the experiments in the core R&D activity met the directly related eligibility requirement for it to be a supporting R&D activity. This requirement means that for an activity to be eligible as a supporting R&D activity it must be directly related to a core R&D activity, However, when the company described the scope and costed the activity it was careful to include only the apportionment of costs that related to the production of the prototypes and not its ordinary production items. The ordinary production items were not directly related to the core R&D activity and hence not eligible to claim under the R&D Tax Incentive.

Additionally, as the activity produced goods (in the form of the prototypes) it also had to meet the dominant purpose test. PoolZapper self-assessed that the production of prototypes that would only be used in the experiments in a core R&D activity (and not for later sale) met the dominant purpose test because it was their only purpose and consequently the activity met all the requirements to be a supporting R&D activity.

Core R&D Activity 3:

Integrating the catalyst to cell housing

This activity was a series of two separate but related experimental activities.

PoolZapper began to develop a new chlorinator cell that incorporated the catalyst into the cell housing. By having the catalyst in the housing the company believed that the new cell could easily be refurbished in house, allowing it to offer a unique trade-in service to customers.

Cell case configuration

PoolZapper took a number of cell cases and modified them to incorporate the catalyst in different configurations. Each of these configurations were developed on the basis of best professional knowledge and understanding of the relevant variables. Each modified case was tested for ease of assembly/disassembly, life expectancy, and effectiveness in chlorination. The results of the tests were used to inform the next cell case design. This iterative process was continued until a case was developed that could be incorporated into the current cell production run with minimal re-tooling whilst at the same time allowing for ease of refurbishment.

The significant challenge in undertaking this work centred on the requirements that the material and assembly method used would also allow for easy and commercially viable disassembly during refurbishment. This challenge was compounded by the company's desire to make the unit tamper proof, which meant avoiding semi-permanent fixings like screws or nuts and bolts. Traditional snap fixings were not suitable due to their one-time-use characteristics. PoolZapper developed a snap fixing that incorporated a release mechanism activated by a key.

New snap fixing device

The company's engineers could not identify any existing or similar fastener that combined their desired features with known compatibility, with the thermal expansion characteristics of their casing plastics and a corrosion proof mechanism, and could not identify any engineering methods to predict how to design such a fastener that would not potentially damage the casing or fail over the service life of the casing.

The company experimented with a number of designs, based on existing fasteners used in other applications. The company also tried some design ideas of its own engineers. The experiments were conducted using accelerated thermal cycling and corrosion exposure in a test facility. One of the company's own designs was a standout performer, and the company is investigating patent protection and exploring the potential to licence its new design.

Supporting R&D Activity 2:

Manufacturing cell cases

PoolZapper took the required number of cell cases for modification from its normal cell case production run. These cases were then manually modified into the form needed for the core R&D activity. As with the chlorinator cells used in the first experiment, the company self-assessed that the manufacture of the cell cases used in the experiments to be a supporting R&D activity as it met both the requirement that it was directly related, and undertaken for the dominant purpose of supporting a core R&D activity.

Neither core nor supporting R&D activities

When the company had developed a cell case that fulfilled its requirements, it modified the cell housing production process to manufacture the new cell case.

The company knew how to modify the process and self-assessed that no new knowledge was generated and the activity was not a core R&D activity.

The company also self-assessed that it was not a supporting R&D activity. This is because the activity to modify the cell housing production process did not directly support a core R&D activity. The core R&D activities only required sufficient cell cases to enable the experiments to be conducted and these were produced by manually modifying standard cases in the supporting R&D activity outlined above. For this reason, the core R&D activity would not have been affected in any way if the activities that modified the cell production process line had not been undertaken at all.

Furthermore, the dominant purpose of modifying the cell case production method was to produce a product that would be used or sold by the company. Therefore, the dominant purpose of modifying the production line was to produce goods.

What documentation did PoolZapper Keep?

In relation to the RSP, the company maintained documentation including the contract, all communications, invoices, and agreements on the rights to use any background intellectual property.

PoolZapper was particularly concerned about the level of documentation it would need to substantiate its claim for the activities undertaken in a production environment. After studying the department's guidance material, the company decided that its normal production run sheets (and quality control sheets) supplemented with an additional column to identify the experimental production runs would largely suffice.

The company decided to add columns identifying the sheets as being part of the R&D activities, and the provision of an area to note observations and comments. The company also used the accounting part of its financial management software to identify costs associated with each of the core and supporting R&D activities.

PoolZapper were careful to document the hypotheses and method of experimentation, results obtained, analysis conducted and final conclusion of its R&D activities. The documentation was designed to record information that would assist the company to demonstrate the R&D activities conducted.

Commentary

R&D in a production environment – dominant purpose

In this example, PoolZapper decided the most cost effective way to manufacture its prototype chlorinator cells was to piggy back it to a normal production run. However, normal production runs manufacture goods for commercial sale and have this as their dominant purpose. For this reason, had PoolZapper tried to register the whole production run as an R&D activity it would not have met the dominant purpose requirement to be a supporting R&D activity (similarly, it would not have met the directly related requirement either). The R&D Tax Incentive is intended to support the generation of new knowledge by experimentation and not the commercial production of goods for sale.

Instead PoolZapper registered only that portion of the production activity that produced the prototype chlorinator cells. Because of the reduced scope of the activity as described on its application for registration PoolZapper was able to meet the dominant purpose test. Also, when it came to claiming the R&D offset, the company was careful to apportion its costs accordingly and claim only those that it was entitled to.

Feedstock

Companies may make the business decision to sell or use the immediate product of their eligible R&D activities (such as the chlorinator cells produced from PoolZapper's experimental trials). Companies that sell or use the product of their

eligible R&D need to examine the feedstock rules (which are available at the ATO website) and include the necessary feedstock adjustment amount in their income tax return.

Example 3: BuzzBirds

This example explores R&D as part of a company's strategy to position itself toward high-end value dense markets.

The business scenario and commentary also describe conditions for an **Advance/Overseas Finding,** including its four key requirements.

Business Scenario

BuzzBirds is a small Australian toy company that manufactures radio controlled helicopters. The company, which has been enjoying great success with its miniaturised low cost toys, sources parts from overseas and assembles the units in Australia.

To ensure its continued success, BuzzBirds decided to develop a new model that included a multi-lingual voice recognition system suitable for a range of global export markets. BuzzBirds believed this product would have an enormous market expansion potential.

The company believed that it could create a new model that would be controlled via a headset and microphone and would be backwards compatible with all of the company's existing product lines.

However, the company soon realised that the proposed voice activation system contained many challenges, including the need to produce a hybrid integrated circuit (HIC) with the capacity to carry the voice recognition and training firmware.

Core R&D Activity 1:

Development of a core algorithm, training and testing the speech recognition neural network software

The company's research into voice recognition software and the related hardware requirements found that the use of multi-lingual voice recognition functionality was both excessive to requirements and impractical in terms of the size of memory space available. The company decided to investigate a voice trainable system that could associate sounds with helicopter direction commands. This system would learn spoken commands when a user said the word "right" (in any language) while pressing the manual controller to the right. After sufficient training runs the user would say 'right' and the helicopter's voice activation system would instruct the helicopter to turn to the right.

The company engaged a software engineer with experience in neural networks to source or develop algorithms to power the voice activation software that will be used in the small HIC. The software engineer advised that this task would take more time than BuzzBirds were anticipating. She advised that while there were existing neural networks that would likely be able to learn and respond to the vocal commands as needed, those networks were too large and memory intensive for the application BuzzBirds wanted. Consequently, bespoke algorithms would need to be developed and optimised for purpose. The software engineer advised that this was a risky endeavour and would require additional time because it needed experimental

development and testing to arrive at the final algorithms. The software engineer also advised that there was no guarantee of success.

For the purposes of initial testing, the algorithms in the form of the coded software were loaded onto a PC. The software displayed arrows and crosses on the screen to indicate the command it had received either through the manual controller or through vocal commands. A team of twenty operators were selected with a range of different vocal characteristics and languages. The operators issued vocal commands into the microphone while moving the manual controller in the relevant direction to allow the software to form the associations. This was repeated a number of times for each command. The operators then only spoke the trained commands in a variety of vocal pitches and observed the results.

After many failures and going back to the drawing board on the algorithms, an optimised neural network software successful learned to recognise spoken commands after an average of four repetitions, with a wide range of tolerances for variations in the way words were spoken. With the optimised software now successfully developed, the company was able to provide the memory requirements to its electronics contractor in Vietnam, to construct the HIC that would be inserted into the helicopter headset controllers.

BuzzBirds used the department's *R&D Tax Incentive Online Snapshot Tool*[14] and determined that the development of the core algorithm, the training and testing of the speech recognition neural network software could be supported by the R&D Tax Incentive. The company self-assessed that this activity would be eligible to be registered as a core R&D activity.

Supporting R&D Activity 1:

Developing the HIC to run the neural network firmware

The size and processing capacity required to run the firmware was determined in the first core R&D activity. The company that BuzzBirds engaged to develop the HIC were experts in the field and advised that the development of the HIC would not require any experimental activities. Therefore, BuzzBirds concluded that the development of the HIC was not eligible as a core R&D activity.

The development of a suitable HIC was required as traditional integrated circuits would be too large and require too much power to be used in a headset controller. BuzzBirds self-assessed that the development of the HIC was a supporting R&D activity because it was required for the core R&D activity to take place and was not undertaken for any other purpose. For these reasons it was self-assessed as both directly related to the core R&D activity and undertaken for the dominant purpose of supporting a core R&D activity. Because the development of the HIC was to be conducted overseas, BuzzBirds knew that it needed to apply for, and receive, an overseas finding[15] before it could claim this activity under the R&D Tax Incentive.

BuzzBirds used the *R&D Tax Incentive Application: Advance/Overseas Finding*[16] form to apply for a Finding on whether the overseas activities were eligible. The company was comfortable to progress the development of the HIC regardless of the

[14] The department's R&D Snapshot Tool is available through the business.gov.au website.
[15] More information on Overseas Findings is available from the *Guide to Findings* on the business.gov.au website.
[16] The application form for an Advance/Overseas Finding is available on the business.gov.au website.

outcome of the finding and did not wait for its application to be approved before entering into a contract with the overseas company.

Overseas Finding application

The company applied for an Overseas Finding for its supporting R&D activity. In its application, BuzzBirds detailed its R&D activities, and in particular demonstrated how the planned overseas activity was directly related and shared a significant scientific link to the Australian core R&D activity of testing the performance of the HIC. The company also detailed how it self-assessed that the dominant purpose test had been met. Before the company decided to contract the overseas company to construct the HIC, BuzzBirds had investigated the Australian market to see if a domestic manufacturer could undertake the work. Despite its enquiries, BuzzBirds could not identify a supplier that was capable of meeting the design requirements. To substantiate that the proposed overseas activity could not be conducted in Australia, the company provided the results of these investigations to the department as part of its application.

BuzzBirds also demonstrated that the anticipated and actual expenditure of overseas activities would be less than the total anticipated and actual expenditure on the related Australian R&D activities in all income years.

The overseas activity was found to be eligible by Innovation and Science Australia, and an Overseas Finding Certificate was issued to BuzzBirds.

Core R&D Activity 2:

Testing the prototype headset controllers

BuzzBirds then conducted experiments to test the performance and battery life of the prototype headset controllers. The company wanted to know how the prototype performed when controlling a range of BuzzBirds helicopters including models with multiple main motors, cameras and water cannons. The company also wanted to evaluate the performance of the controller for potential interference when more than one was used at the same time in close proximity.

While BuzzBirds had tested and proven the software's ability to respond to spoken commands using a PC and microphone, it was uncertain, based on current knowledge, information and experience, how the HIC and its embedded software would operate in practice and under different conditions using the prototype headset controllers. For example, whether the voice activation concept would enable a sufficient degree of control to manoeuvre the helicopters. In particular, whether a child's thinking and response times were fast enough to exercise a satisfying amount of control over a helicopter in flight. It was also unknown whether and to what degree background noise would interfere with the processing of the verbal commands. Therefore, BuzzBirds self-assessed that the outcome of these experiments could not be known in advance and that these activities could be registered as a core R&D activity.

Supporting R&D Activity 3:

Assembling and training the prototype headset controllers

The company assembled twenty prototype headset controllers at its facility. As the first core R&D activity had generated the knowledge of how to train the neural

network, the company self-assessed that the training of the prototype headset controllers was now a known process and was therefore not a core R&D activity.

However, assembling and training of the prototype headset controllers was required before the equipment could be tested for performance and power consumption. The company determined that for the purposes of its testing schedule, twenty headset controllers would be required to adequately assess their performance. The headset controllers were not used for any other purpose; therefore, BuzzBirds self-assessed the training of the prototype headset controllers to be a supporting R&D activity as it was directly related to testing the prototype headset controllers in Core R&D Activity 2 and conducted for the dominant purpose of supporting that activity.

What documentation did BuzzBirds keep?

BuzzBirds documented its hypotheses and detailed descriptions of the experiments that tested these hypotheses. The company documented its observations and evaluations of the experiments and the logical conclusions that were reached.

In addition, BuzzBirds kept:

- the invoices for all expenses it wished to claim under the activities and annotations where necessary to explain how the costs related to the activities,
- time sheets for all staff involved in the activities that showed the hours that the staff members were undertaking the activities,
- the results of its research that showed that the expertise and facilities to produce the HIC wasn't available in Australia,
- communications between BuzzBirds and the overseas manufacturer of the HIC,
- the batch numbers of the HIC units, and
- records that documented the use of the new HICs in the experiments.

Commentary

Overseas Findings

Advance and Overseas Findings are designed to provide certainty to companies about their entitlement to benefits under the R&D Tax Incentive. They provide a binding determination issued by Innovation and Science Australia as to whether specific activities are eligible to be claimed under the programme.

Overseas work must satisfy four requirements to be eligible as an overseas activity:

1. the overseas activity must be an eligible R&D activity,
2. the overseas activity must have a significant scientific link to one or more core R&D activities conducted in Australia or an external Territory. Those activities must be registered or reasonably likely to be conducted and registered in the future,
3. the overseas activity must be unable to be solely conducted in Australia or an external Territory, and
4. the total amount (actual and reasonably anticipated) to be spent in all income years by the company and any other entities on the overseas activities is less than the total amount (actual and reasonably anticipated) to be spent in all

income years on the Australian core R&D activities and supporting R&D activities related by the significant scientific link.

The overseas activity must be an eligible R&D activity

If a company seeks an overseas finding on either a core or a supporting R&D activity, it is required to demonstrate that the activity satisfies the definition of either a core or a supporting R&D activity (that is, subject to all the relevant eligibility criteria for either a core or a supporting R&D activity).

The overseas activity must have a significant scientific link to one or more core R&D activities conducted in Australia

To be eligible for an Overseas Finding, it is important to demonstrate that the overseas activity has a significant scientific link to one or more registered Australian core R&D activities, the 'Australian core activities'. It is important to note that the overseas activity may start before the Australian core activity if the Australian core activity is reasonably likely to be conducted and registered under the R&D Tax Incentive.

A significant scientific link to the Australian core activities means that Australian core activities cannot be completed without the overseas activity being conducted.

In this example, BuzzBirds clearly showed the links between the planned overseas activity and the Australian core activity. The company demonstrated that without the HIC from the overseas activity, the development of the prototype headset controller could not occur.

The overseas activity must be unable to be conducted in Australia

To be eligible for the R&D Tax Incentive, R&D activities proposed to be conducted overseas must not be able to be conducted solely in Australia (or its external Territories) for one of four reasons[17]

1. conducting the R&D activities requires access to a facility, expertise or equipment not available in Australia or its external Territories,
2. conducting the R&D activities in Australia or its external Territories would contravene a law relating to quarantine,
3. conducting the R&D activities requires access to a population (of living things) not available in Australia or its external Territories, or
4. conducting the R&D activities requires access to a geographical or geological feature not available in Australia or its external Territories.

BuzzBirds conducted various literature searches and consulted with industry experts and determined that the expertise required to develop an appropriate HIC was not present in Australia. To comply with this requirement BuzzBirds maintained meeting minutes and records on the literature and web searches undertaken.

[17] It should be noted that companies will not be granted an Overseas Finding certificate for activities that take place overseas for purely financial reasons.

Total expenditure on eligible overseas activities of the project must be less than the expenditure on the eligible Australian R&D activities

An important consideration for companies is the condition that:
the total actual and reasonably anticipated expenditure of any entity in all income years on:

- *the overseas activities; and*
- *each other activity (if any) conducted wholly or partly outside Australia and the external Territories that has a significant scientific link to the Australian core activities;*

is less than the total actual and reasonably anticipated expenditure of any entity in all income years on:

- *the Australian core activities; and*
- *activities conducted within Australia and the external Territories that are supporting R&D activities in relation to the Australian core activities.*

If the expenditure on overseas activities (both stated in the application and reasonably anticipated in all income years) is greater than the expenditure on the related activities conducted in Australia, a company will not be eligible for an Overseas Finding for the overseas activities. However, R&D activities conducted within Australia could still be eligible for the R&D Tax Incentive.

Example 4: Rutimech

This example examines some of the issues faced by companies conducting R&D activities to achieve full scale production processes from their initial proof of concept stage.

The scenario addresses the following topics:

- R&D in scale-up activities,
- the separation of core and supporting R&D activities, and
- the transition to normal production.

It also demonstrates the importance of documentation and knowledge management in demonstrating why the experimental activities were necessary, as well as identifying the point where the R&D activities end and usual business activities commence.

Business Scenario

Rutimech is an Australian company that specialises in the manufacture of custom alloys for specialist applications. It uses an electrolysis-based process for processing raw rutile ore into titanium. The company operates a small facility with 30 employees, including an R&D team who operate a laboratory with a small scale electrolytic cell for testing new alloy formulations and process improvements.

For some years, Rutimech has undertaken research to implement “inert anode” technology in its process to replace the existing carbon anodes. Carbon based anodes are consumed during the titanium manufacturing process, requiring regular replacement, and the process directly emits greenhouse gases. Inert anodes overcome both these issues, and the company believed it could increase energy efficiency and lower process costs.

However, research by the company showed that existing inert anode materials did not deliver improved energy efficiency or the required quality of product when used with titanium. In a previous R&D project, Rutimech researched some new anode materials using a simple crucible bench-top test in its laboratory. In these experiments the company identified a new material it believed had the potential to produce titanium and reduce energy requirements.

Rutimech identified that the next stage of its R&D programme was to establish the viability of the new inert anode material in its lab-scale pilot cell, and to determine whether it could then be used to replace the carbon anodes in its existing production cells.

Core R&D Activity 1:

Testing new anode material in a pilot cell

Rutimech tested the new anode material in the pilot scale electrolytic cell in its laboratory to establish the viability of the material. The testing activity differed from the previous laboratory bench tests in that the anode was installed in a cell designed for manufacturing titanium rather than a simple crucible used in the bench-top

experiment. The experiment also ran for a longer period of time to monitor the behaviour of the anode over a longer time scale.

Rutimech consulted the department's guidance products[18] and self-assessed that the testing of the new anode material in the pilot cell was an eligible core R&D activity as:

- information on the voltage required, and the by-products produced by the process, did not exist (or was not publically available) prior to the conduct of the experimental activities, and
- the outcome sought by conducting these activities could not be known or determined in advance and an experiment would need to be conducted to test the new anode material.

The company provided information in its registration for the R&D Tax Incentive about how the anode shape, cell design and input current was different to the initial bench-top tests (which merely established whether the material worked to produce titanium). Rutimech also demonstrated why it was not known or determinable in advance how these differences would affect the performance of the anode and cell.

At the end of the tests, Rutimech concluded that the anode material operated effectively in the pilot cell without significant degradation or undesirable by-products being produced.

Supporting R&D Activity 1:

Manufacture and installation of the new anode

In order to test the material, Rutimech engaged a specialist manufacturer to make the anode. While the new anode did require a different method of manufacture to carbon anodes, the method of manufacture was well known. For this reason, Rutimech determined that this activity did not meet the requirements of a core R&D activity. However the company self-assessed that the activity was directly related to the core R&D activity of testing the anode. Similarly, the installation of the anode followed an existing process but was directly related to the core R&D activity as it contributed to the set up and conduct of the experiment.

Core R&D Activity 2:

Testing the new anode material in a production scale cell

With the success of the pilot scale test programme, Rutimech made the decision to test a full size anode in one of its production cells and self-assessed that this would be eligible as a core R&D activity for the R&D Tax Incentive.

The testing activity differed from the previous laboratory pilot scale tests in that the anode was now larger, the current supplied to the anode was increased and the production cell was different in size and design to the lab test cell. Periodic tests were conducted to establish the behaviour of the anode over varying operational time scales and conditions.

Rutimech's researchers knew that these changes could have effects on the performance of the cell, the anode and by-products that could not be reasonably

[18] More information about the eligibility of activities is available in the *Eligibility of Activities* Information Sheet on the business.gov.au website.

predicted based on the previous experiment. The company had developed a hypothesis about how it might behave and self-assessed the experiments to be a core R&D activity.

In its registration for the R&D Tax Incentive, Rutimech provided information about how the larger size of the anode and cell (in terms of applied current, surface area and volume) was expected to produce changes in the cell behaviour that could not be reliably predicted on the basis of the previous tests. The company supplied a summary of a report comparing the behaviour of carbon anodes and how the process varied between the small scale and the large scale, and how it was not possible on the basis of these results to confidently predict how the new anode material would behave when scaled up.

Rutimech was able to demonstrate why the behaviour of the scaled up process could not be known or determined in advance, and why a testing programme for the full scale process would generate new knowledge.

Supporting R&D Activity 2:

Manufacture and installation of the new anode

As in the first stage of the R&D project, Rutimech engaged the specialist manufacturer to make the anode. As the activity was directly related (as part of the setup of Rutimech's experiment) to the core R&D activity (testing the anode in a production scale cell), the company once again self-assessed that the process of manufacturing and installing the anode to be a supporting R&D activity.

Neither core nor supporting R&D activities

The testing of the new anode required the activity to be conducted during a production run. However, the tests were only required to be conducted periodically and at a frequency that would enable accurate statistical analysis. Thus, the running of the production cell was not considered to be an eligible activity during the periods between the testing, even where routine monitoring of the cell was undertaken and the data used to inform the experiment.

Rutimech self-assessed the testing of the new anode was completed when the company could confidently predict the stable lifetime of the anode in the production cell.

What documentation did Rutimech keep?

Rutimech maintained comprehensive records and documentation for the duration of the research project. This included the results of literature searches, laboratory notebooks, experimental protocols, experimental results, research reports, manufacturing reports from the production cell, and contractor reports from the anode manufacturer.

In addition to ensuring that it was 'compliance ready'[19], Rutimech was aware that the records it kept could provide valuable information for future projects and form part of the company's intellectual property portfolio.

[19] The department has two detailed guides on being 'compliance ready' on the business.gov.au website:

Initially, Rutimech was concerned about the level of documentation it would need to substantiate its claim for Core R&D Activity 2, as it was conducted in a production environment. After studying the department's guidance material, it decided that the addition of a few columns to both its run sheets and quality control sheets would suffice.

The additional columns enabled the company to identify the sheets as being part of the R&D activities and provided an area for the operators to record their observations, test results and general comments.

The company also used the accounting part of its financial management software to identify costs associated with each of the core and supporting R&D activities. The rights to use any background intellectual property were also clearly documented along with details of the rights around any resulting intellectual property.

Commentary

"Scaling Up" and eligible R&D

This example is intended to demonstrate how the R&D Tax Incentive can be used to support scaling up activities. After identifying a suitable anode material and subsequent laboratory tests, Rutimech firstly demonstrated the viability of the anode in a laboratory scale pilot cell, and then in a full scale production cell.

Whilst from a commercial perspective this whole process may be viewed as R&D, it is important when registering for the R&D Tax Incentive to demonstrate that each activity in the "scaling up" process that the company wishes to register and claim meets the eligibility requirements. It is also important in a production environment to differentiate between the R&D process and "business as usual" operations when claiming activities under the programme.

One of the requirements of the legislation that needs to be considered in scaling-up activities is whether the outcome of experimental activities could not be known or determined in advance on the basis of current knowledge, information or experience. In some environments where scaling up is taking place, it may be possible to predict the outcome of larger scale tests on the basis of earlier small scale tests, as the small scale tests reliably establish how the product or process will behave. In such situations the larger scale tests would not be eligible as core R&D activities as they would not generate new knowledge. However, where it can be demonstrated why the small scale tests could not determine key aspects of the behaviour of the larger scale product or process, these larger scale tests may be eligible. The department has developed Specific Issue Guidance on the topic of scaling up which is available on business.gov.au.

R&D in a production environment

In this example Rutimech decided it was not feasible to attempt a full production run if serious delays were likely, due to the cost in down time to repair the cell in the event of anode failure. However, the results of the testing in stage one provided the company with confidence that the risk of anode failure was low, and that the key

1. *Compliance Readiness – Importance of Record Keeping*
2. *Compliance Readiness – Risk Review and Findings*

effects being measured related to process by-products, anode lifetime and output quality.

Rutimech, therefore, took the economic opportunity to piggyback the experiment onto a production run. The company recognised that the dominant purpose of a production run was commercial and that the piggy backing of the experiment would not be sufficient to change this. Accordingly, the company defined its R&D activity in its application for registration to cover only those times and parts of the production run where genuine testing was undertaken. Similarly the company knew it could not claim the full cost of running the production cell across the length of the experiment as the tests were taking place at irregular intervals. As a result, it claimed only an apportionment of costs associated with running the production cell line during the testing periods.

Feedstock

Companies may make the business decision to sell or use the immediate product of their eligible R&D activities (such as the titanium produced from Rutimech's experimental trials). Companies that sell or use the product of their eligible R&D need to examine the feedstock rules (which are available at the ATO website[20]) and include the necessary feedstock adjustment amount in their income tax return.

[20] Information on Feedstock Rules is available on the ATO website at: https://www.ato.gov.au/business/research-and-development-tax-incentive/in-detail/fact-sheets--ato/research-and-development-tax-incentive---feedstock-adjustments/

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