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Public Consultation – Concept Examples for Eligibility of Work for SR&ED Investment Tax Credits

CRA's SR&ED Policy Review Project
KPMG Submission

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Contents

Review of Example 1 – Illustrating concepts of a technical problem vs. a technological uncertainty

1. Does the example appropriately illustrate the identified concepts?

KPMG believes that the example is suitable to illustrate the difference between a technological uncertainty and a technical problem. However, we note that the example, like others in the document, does not include in the discussion the degree to which the technology base level of a company may affect whether a situation is technological vs. technical. In our experience, the capabilities and achievements of a company can significantly affect whether a situation is technical vs. technological.

KPMG suggests that the example could benefit from including commentary stating that often technical problems simply require the proper assessment via measurement or qualification of the issue using known tools or techniques. That is, the outcome or solution to a technical problem can often be resolved through direct measurement and change. Whereas a technological uncertainty likely results in a greater understanding of the underlying reasons and variables involved as a result of experimentation.

For instance, in the CRA's example, measuring the acidity of the liquid in the pump would quickly reveal that it was beyond the specifications of the seals. In Case 2 in the example, the failure of the seals was related to multiple variables and conditions and failure mechanisms. As a result, no direct measurement could identify a suitable solution.

2. Is the language easy to understand (for example, are there words or expressions that should be changed to improve clarity)?

KPMG has not identified any concerns with the language or terms used in this example.

3. Are there any gaps or omissions in the examples?

KPMG submits that additional details of the scenario and clarification of some details mentioned in Case 2 would ensure that this example would be used strictly to demonstrate the technical problem vs. technological uncertainty, not to determine when qualified SR&ED activities begin.

Specifically, the example lays out a scenario where it is assumed the qualified SR&ED activities do not initiate until the problem is discovered when it states, "Once the cause of the problem was discovered, the supplier began an experimental development project". While this scenario is certainly possible, it would be pertinent to state that the example is not providing any commentary on when an SR&ED project starts. It's possible that in a higher level SR&ED project, eligible activities could have included the tests and analysis of shaft temperatures and seal wearing.

For example, the CRA could add the following at the end of the conclusion: "Note that an experimental development project need not always start when the cause of a problem is identified, as has been illustrated. An SR&ED project may include identifying the cause of a problem if this is occurring after the identification of a technological uncertainty."

4. What are the best features of the examples?

The best feature of the example is that it provides two cases that clearly show varying levels of investigation required to resolve the issue at hand. As a result, the example demonstrates the types and levels of activity that are generally required in an eligible SR&ED project.

5. Do you have any other comments or suggestions to improve these examples?

It may be challenging for taxpayers to apply this example to situations and scenarios in other industries or types of science because the example is very specific to a mechanical engineering situation.

6. Would you like to suggest new examples?

KPMG does not feel that any further examples are required to illustrate this concept, provided that our suggestions are addressed in the current example.

Review of Example 2 – Illustrating concepts from paragraphs 1 and 2 of section 2.1.1 of the Eligibility of Work for SR&ED Investment Tax Credits Policy

1. Does the example appropriately illustrate the identified concepts?

It is KPMG's view that this example generally provides a good illustration of how a technological uncertainty may arise from limitations within existing technology. However, a limiting factor of this illustration could be that the scenario is very specific to a process development project and relies on the statement that "there was no publicly available information" on the new technologies under consideration.

While it is agreed that taxpayers need to search for publicly available information as a matter of policy, it may be contentious as to exactly what level of action is required within different business context's before "publicly available" information is exhausted and a true limitation has been identified. For example, would a manufacturer or producer without dedicated R&D departments be expected to search scientific journals that may not be readily assessable?

KPMG appreciates the inclusion of the possibility that ultrasonic maceration may have been attempted on other oilseeds but that for this particular type of oilseed, a unique technological uncertainty may exist since often in industry these scenarios are present and result in eligible SR&ED activities.

2. Is the language easy to understand (for example, are there words or expressions that should be changed to improve clarity)?

KPMG submits that the language in the example is straightforward but taxpayers who are not familiar with the agricultural industries may have to do additional reading or interpretation to apply the concepts illustrated to their particular industry or scenario.

One statement which may require some modification is the first sentence in the second paragraph of the example, which states, "The main limitation of the current technology is that the meal is a mixture of the protein-rich flour and seed coats."

KPMG submits that it is unclear how a meal mixture composition can be a limitation in technology. We suggest that this sentence could be clearer if it stated, "Because the meal is a mixture of the protein-rich flour and seed coats, current technologies are limited in their ability to process it".

3. Are there any gaps or omissions in the examples?

The only perceivable gap in the example is that the technological uncertainty encountered by the taxpayer is one that involves introducing a new technology, yet it is evident from Paragraphs 1 and 2 of the policy that it need not be a new technology that results in an technological uncertainty, merely technological uncertainty in "paths, routes, approaches, equipment configurations, system architectures, or circuit techniques" or similar, as long as it is technological in nature.

KPMG submits that the example's conclusion could include commentary to the effect that this is merely one type of technological uncertainty that could be encountered. Efforts to better understand approaches or equipment configurations using existing technologies could just as easily result in the identification of a technological uncertainty.

4. What are the best features of the examples?

This example provides a good understanding of how a technological uncertainty may arise when existing technologies are not capable of doing what is needed and new technologies that work on different principles are being investigated or adopted into a new situation or scenario.

5. Do you have any other comments or suggestions to improve these examples?

KPMG does not have any further comments or suggestions on this example other than the comments made above.

6. Would you like to suggest new examples?

An additional example that illustrates the identification of a technological uncertainty surrounding a project that starts within the realm of standard practice and results in the identification of a technological uncertainty would be highly beneficial.

We suggest an example that details attempts to increase production rates using existing technologies that now need to be better understood or modified to achieve increased rates of production. In our experience, these types of projects are typically harder for the taxpayer to identify and lead to confusion about which experimental activities and material costs to document as SR&ED eligible.

Review of Example 3 – Illustrating concepts from paragraph 5, section 2.1.1 Eligibility of Work for SR&ED Investment Tax Credits Policy

1. Does the example appropriately illustrate the identified concepts?

KPMG believes that the example is appropriate and does a good job of conveying how SR&ED may exist within a project where the main project objective is driven by the need to use a less costly process (i.e., financial constraints). Value could be added to this example by expanding the conclusion paragraph to not only describe the portion of the project that has eligibility but to explain to claimants that because the objective of the project is to convert CO to CO2 at room temperature, that should be the focus of the technological objectives section of the report.

A suggested revision to the text is as follows:

> Although the cost target by itself is not a technological uncertainty, a technological uncertainty may arise from the need to avoid using a costly process, even though that process is known to work. The required cost target is also the motivation or reason for the company to undertake work to remove this uncertainty. As the cost target is only the motivation or reason for the company to undertake the work to remove the uncertainty, it does not need to be discussed in the technical report. Only the technological objective sought as a result of this target is required to be stated along with the specific uncertainties associated with achieving this technological objective and the specific activities undertaken in removing these uncertainties.

2. Is the language easy to understand (for example, are there words or expressions that should be changed to improve clarity)?

KPMG submits that the only language change that needs to be considered would be to include the term "business objective" in describing the cost targets that are desired and "technological objective" in describing the desired process to convert CO to CO2 at room temperature.

3. Are there any gaps or omissions in the examples?

KPMG submits that there are no gaps or omissions in detailing how a technological uncertainty may arise within a business project that has cost targets.

4. What are the best features of the examples?

The best feature of the example is that it clearly outlines that the main driver of the project is a cost reduction but that the SR&ED does not derive directly from those facts. Instead, the SR&ED derives from the fact that an investigation into achieving the same outcome using an inexpensive solution is required.

5. Do you have any other comments or suggestions to improve these examples?

KPMG does not have any additional comments or suggestions for this example.

6. Would you like to suggest new examples?

It may be challenging for taxpayers to apply this example to situations and scenarios in other industries or types of science because the example provided is very specific to a product.

A more common but useful example may be derived from examining scenarios within a manufacturing or production environment where cost reduction initiatives may result in the introduction of technologies. Examples may involve manpower elimination, material substitution or increased rates of production that require an investigation that encounters a technological uncertainty.

Review of Example 4 – Illustrating concepts from paragraph 10, section 2.1.1 Eligibility of Work for SR&ED Investment Tax Credits Policy

1. Does the example appropriately illustrate the identified concepts?

KPMG believes that the example presents a situation where the use of standard practice may not result in SR&ED. However, the manner in which the example is presented may place too much emphasis on the specific activities performed when the actual reason that there would not be SR&ED is the lack of a technological uncertainty, not the type and nature of the activities (i.e., there is reasonable certainty that the technique will achieve the desired result).

However, we believe there is an opportunity to clarify this point by expanding the example or presenting a second case where the same or similar activities result in eligible SR&ED. See the section below on gaps and omissions.

2. Is the language easy to understand (for example, are there words or expressions that should be changed to improve clarity)?

KPMG submits that the language is appropriate given the nature and type of the example provided.

3. Are there any gaps or omissions in the examples?

KPMG submits that the gap that may be associated with this example is an opportunity to clarify that it is not the type or nature of the activities themselves that make these activities ineligible as SR&ED. Instead, these activities are ineligible because there is no technological uncertainty, which therefore makes these activities standard practice.

To better clarify this example, KPMG suggests that a second case be presented in which these same activities are undertaken by a seed company developing a plant variety under which the same or similar activities are part of an eligible project.

4. What are the best features of the examples?

KPMG submits that this example helps to show that standard practice type of activities, when done in isolation, do not qualify for SR&ED even though there could be iteration and testing of several potential, though well understood, solutions.

5. Do you have any other comments or suggestions to improve these examples?

This example is very specific to a greenhouse or agriculture industry and specifies the area used for the new plant variety (2 to 10 acres). However, taxpayers that do not have expertise in the industry are unlikely to understand the significance of this number. KPMG therefore suggests eliminating this specific industry references that affects the determination of eligibility because many readers may not understand it.

6. Would you like to suggest new examples?

It may be challenging for taxpayers to apply this example to situations and scenarios in other industries or types of science since the example provided is very specific. This concept of standard practice is often debated within computer science and information technologies. KPMG suggests that another example illustrating the policy within this field of science would be extremely beneficial to taxpayers in understanding CRA policy.

Review of Example 5 – Illustrating concepts from paragraph 1, section 2.1.2 Eligibility of Work for SR&ED Investment Tax Credits Policy

1. Does the example appropriately illustrate the identified concepts?

KPMG believes that the example appropriately illustrates the concept of a hypothesis. However, since this concept is widely known, it would be helpful to also illustrate the concept of a "documented hypothesis" because documenting a hypothesis is one of the items mentioned in the eligibility document as a result of section 2.1.2 and 2.1.5 of the Eligibility of Work for SR&ED Investment Tax Credits Policy.

2. Is the language easy to understand (for example, are there words or expressions that should be changed to improve clarity)?

KPMG has not identified any concerns with the language or terms used in this example.

3. Are there any gaps or omissions in the examples?

As we noted in question 1, we suggest there is an omission in that the example does not refer to documenting a hypothesis. KPMG believes the majority of questions from taxpayers will arise in this area. As such, the example would benefit the most from further information in this area.

For instance, the example could go on to show that the project scientist had developed a test plan to develop glue within the company process while introducing the new additive to better understand how to use it to increase the bond strength of the glue. Then, to complete the example, the conclusion could state that the test plan document represented a valid documented hypothesis. We propose that this conclusion would be much more valuable than the existing conclusion, which simply states that a hypothesis was made.

Also, a point/counter-point example showing a valid documented hypothesis and an invalid documentation of a hypothesis would help answer many questions that have arisen on the topic.

4. What are the best features of the example?

The best feature of the example is that, with the suggested expansion, it can further clarify a concept that many taxpayers have found unclear since the release of the new eligibility policy. Specifically, we believe the example could elaborate on what is eligible SR&ED and what is not based on the idea of hypothesis documentation.

5. Do you have any other comments or suggestions to improve these examples?

Along with the concept that this example addresses (formulation of a hypothesis), it also provides commentary on two other concepts of eligibility determination which KPMG believes may lead to this example being utilized to try and illustrate other eligibility concepts than the one intended.

Specifically, the example refers to when an SR&ED project starts and also refers to the degree to which a company is required to investigate publicly available knowledge. We are concerned that this example could be used to state that an SR&ED project could never occur until scientific and technical publications are fully reviewed even though these publications are not readily accessible for many businesses and are not part of their normal process.

As well, the example appears to imply that the SR&ED project wouldn't start until the R&D department developed their hypothesis. While this is certainly possible, it's equally plausible that all of the activities described are part of a project that started much earlier (perhaps within production) before the R&D department was asked to get involved.

KPMG therefore recommends that the first sentence in the example be removed and that the conclusion explain that the technology base level of a company is always considered when making determinations of eligibility.

6. Would you like to suggest new examples?

KPMG does not feel that any further examples are required to illustrate this concept, provided that our suggestions on appropriateness and gaps or omissions are addressed in the current example.

Review of Example 6 – Illustrating concepts from paragraph 7, section 2.1.3 Eligibility of Work for SR&ED Investment Tax Credits Policy

1. Does the example appropriately illustrate the identified concepts?

KPMG submits that the example may not present a suitable example of trial and error. Specifically, we feel that this example, with the inclusion of more details about the level of science at which the company was understanding and making its decisions, could show a pattern of analysis and learning in each step of the investigation. However, the example appears to exclude these details and only describes the actions taken in the trials and not the analysis and hypothesis behind these trials, making the trials appear to be done without a plan.

In KPMG's opinion, this example illustrates a situation that could be a systematic investigation and not strictly an example of trial and error. As such, we believe the majority of taxpayers looking to claim SR&ED may not understand this example. Thus, we believe that the example may not adequately illustrate the concepts discussed.

2. Is the language easy to understand (for example, are there words or expressions that should be changed to improve clarity)?

In general, the language is easy to understand. However, those who read this example without the requisite background in food science or food production may not be familiar with what is deemed to be standard practice or development in this industry. As a result, the example may not be effective in helping taxpayers understand the concept illustrated.

3. Are there any gaps or omissions in the examples?

KPMG submits that this example presents a series of tests as not being systematic by omitting any mention of analysis and hypothesis development between each step. Because the example does not include any type of analysis or technological learning that may have taken place, it does not mean that the actual events would not have constituted SR&ED.

KPMG suggests either replacing the example with a different trial and error test scenario (see question 6 below) or present a Case 2 where the same or similar activities and steps performed by a company with no base level knowledge in pizza production performs an eligible systematic investigation by completing the steps in a fashion which may be generally accepted as being systematic.

Another consideration may be to include a more specific definition of trial and error. KPMG would suggest that this definition would be based on the fact that trial and error would typically be performed in the absence of specific logic being used in determining the

parameters to be evaluated from one test to the next. In the example provided, logic is used. As such, presenting this situation as trial and error is questionable.

4. What are the best features of the examples?

In general, this example presents an interesting scenario which we believe could form the basis of a good example with the suggested changes.

5. Do you have any other comments or suggestions to improve these examples?

KPMG submits that a clearer example to illustrate trial and error could present the activities as taking place in a more random, non-technological or non-logical fashion.

For example:

Step 1 – A proof of concept with less cheese, low fat pepperoni and different amounts of sauce - Failed because the low fat pepperoni burned.

Step 2 – A vegetarian pizza - Failed because the tomato burned.

Step 3 – A Hawaiian pizza- Failed due to excessive grease.

Step 4 – A Meat Lovers pizza -Success was achieved and the company went to market.

This example shows a series of evaluations with no technological connection or implication of a systematic investigation, yet the result is the achievement of the original goal of creating a new pocket pizza.

6. Would you like to suggest new examples?

KPMG proposes the inclusion of an example that was presented by CRA during a recent audit to describe the concept of trial and error. In this example, a company desires to adhere two objects together with a specific target strength. The company procures five different varieties of glue and, following the manufacturer's recommended instructions, adheres five sample parts. The company then completes an evaluation where each sample is subjected to a tensile load until failure. The company then selects for their production line the glue that failed at the highest load.

The reason this example is trial and error is that the company didn't gain any knowledge concerning the mechanism through which the best glue succeeded or even why that glue was better for their product.

Review of Example 7 – Illustrating concepts from paragraph 4, section 2.1.4 Eligibility of Work for SR&ED Investment Tax Credits Policy

1. Does the example appropriately illustrate the identified concepts?

KPMG submits that the example appropriately illustrates the concept that product or process development do not inherently require or incorporate a technological advancement simply because a new product or process was created and that SR&ED only occurs when there is both a technological uncertainty and advancement.

2. Is the language easy to understand (for example, are there words or expressions that should be changed to improve clarity)?

KPMG has not identified any concerns with the language or terms used in this example.

3. Are there any gaps or omissions in the examples?

KPMG submits that for improved clarity, the heading "Case 1" should be renamed as "Case 1 – No Technological Advancement Required" and "Case 2" as "Case 2 – Technological Advancement Required".

Although it may be obvious to those who deal with the SR&ED program regularly, it may be beneficial to specifically discuss in the conclusion which case required an advancement and which case did not require technological advancement.

4. What are the best features of the examples?

The best feature of the example is that it provides two cases that clearly show two different types of work. One case clearly requires no technological advancement and the other case results in a technological advancement.

5. Do you have any other comments or suggestions to improve these examples?

The second paragraph of Case 2 in this example does not appear to add any relevant facts pertaining to the concept being illustrated, specifically whether technological advancement is required. KPMG proposes that this content be removed from this example as it appears to

illustrate the concept of when an SR&ED project may start, which is not within the scope of this example.

6. Would you like to suggest new examples?

KPMG believes that further examples could be helpful in providing more clarity on the CRA's policy.

Review of Example 8 – Illustrating concepts from paragraph 4, section 2.2.1 Eligibility of Work for SR&ED Investment Tax Credits Policy

1. Does the example appropriately illustrate the identified concepts?

KPMG submits that some improvements could make this example more universal to a variety of scenarios and situations. Specifically, additional commentary could outline that the sample size and confidence levels presented are based on a statistical method of determining the appropriate amount of sticks. This commentary could also point out that this type of approach may not be applicable to all situations.

Within certain industries or scenarios, the number of units required to validate or confirm the completion of an SR&ED project may have other technological factors that dictate what is required to be produced and is therefore commensurate with the SR&ED. For example, a factor in determining whether a new process is successful may include a set operating duration at a steady state or a specific product quantity may need to be provided to a test facility in order to test a specific characteristic at specific rates or volumes.

KPMG proposes that some additional commentary be included in the example to outline that a claimant may have other reasons beyond a statistical confidence level for justifying the amount, size, extent or duration of work that is necessary.

2. Is the language easy to understand (for example, are there words or expressions that should be changed to improve clarity)?

KPMG has not identified any concerns with the language or terms used in this example.

3. Are there any gaps or omissions in the examples?

KPMG submits, as detailed above, that this example's conclusion would benefit from a disclaimer that different industries or scenarios may have justifications beyond a statistical confidence in order to determine what is commensurate with and directly supporting the SR&ED.

4. What are the best features of the examples?

The best feature of the example is that it illustrates that a company needs to have justification for including work as being commensurate with the SR&ED. In the example, this commensurate work resulted in an initial amount that was only 25% of the larger run. However, there is no set requirement that commensurate work be less than later ineligible work.

5. Do you have any other comments or suggestions to improve these examples?

KPMG does not have any other suggestions for this specific example.

6. Would you like to suggest new examples?

KPMG does not feel that any further examples are required to illustrate this concept, provided that our suggestions on appropriateness and gaps or omissions are addressed in the current example.

Review of Example 9 – Illustrating concepts from paragraph 4, section 2.2.2 Eligibility of Work for SR&ED Investment Tax Credits Policy

1. Does the example appropriately illustrate the identified concepts?

KPMG's impression of the example is that overall it presents a suitable scenario to illustrate the difference between support work and routine testing that is not specifically for the SR&ED work.

However, we suggest that the example could benefit from commentary to explain that testing included as eligible support work need not be new or unique tests. The example may give this impression by stating that "tests over and above the work that the technologist routinely performs on a daily basis" would be included in SR&ED. As well, the example could mention that although the efforts related to routine data collection may be excluded from SR&ED, any subsequent analysis of the data that is undertaken specifically as a result of an SR&ED project would be eligible work.

2. Is the language easy to understand (for example, are there words or expressions that should be changed to improve clarity)?

KPMG's only concern is with the statement under Case 2 that in order for data collection to no longer be routine, it must be "over and above the work that the technologist routinely performs on a daily basis". If quoted outside the context of this example, this language could be construed to mean that the eligible tests need to be different, unique or new tests in order to qualify as SR&ED. We believe the example is simply trying to say that the technologist's commensurate and directly supporting work are the tests and activities that are directed by the research chemist.

3. Are there any gaps or omissions in the examples?

KPMG submits that to fill the gaps in the example, a Case 3 could be presented and clarification of some details mentioned in Case 2 could be incorporated.

Specifically, we suggest that Case 3 illustrate a scenario in which end of process checks or QC/QA activities are typically routine work. However, in the context of this proposed example, these tests are being completed under an eligible SR&ED project (i.e., a new product or process development). Specifically, these tests are used to directly determine whether the technological objectives of a project have been achieved. Therefore, these otherwise routine activities are no longer excluded work. This scenario is consistent with the assessment that the purpose of these tests (to see whether objectives have been achieved) rather than the nature of the work (QC/QA assessments) determines the eligibility of the work.

As well, we propose that Case 2 explicitly state that if the research chemist in the context of his SR&ED projects completes any data analysis of the daily routinely collected data, then this data analysis would be eligible work. It could be inferred that this idea is part of the example already, but explicitly stating it could be beneficial to the example.

Case 2's explanation could also state that if the research chemist instructs the technologist to perform his data collection more frequently, then there may be grounds to claim the additional data collection as SR&ED since this aspect is no longer routine in nature and the purpose is evidently to support identification of the solution.

4. What are the best features of the examples?

The best feature of the example is that it provides two cases that clearly show a varying level of testing that may or may not help to resolve the issue at hand. As a result, the example demonstrates the types and level of activity that are generally required to determine the difference in an SR&ED project.

5. Do you have any other comments or suggestions to improve these examples?

It may be challenging for taxpayers to apply this example to all SR&ED situations and scenarios.

6. Would you like to suggest new examples?

KPMG believes it would be beneficial to add a Case 3 scenario to the example to illustrate that routine tests performed on a daily basis, which may not necessarily be "over and above work", can still be eligible SR&ED in the proper context.

Review of Example 10 – Illustrating concepts from Paragraph 2, Section 3.2 of Eligibility of Work for SR&ED Investment Tax Credits Policy

1. Does the example appropriately illustrate the identified concepts?

The purpose of Example 10 is to illustrate the concepts defined in section 3.2 of the Eligibility of Work for SR&ED Investment Tax Credits Policy. Section 3.2 outlines that standard business activities are required to bring a typical product to market and that a technological uncertainty which cannot be resolved through application of the company's standard development practice or expertise can arise as a result of this objective. Resolving the technological uncertainty requires the company to initiate an eligible SR&ED project as a sub-component of the larger company project.

Example 10 clearly indicates that the eligible SR&ED project is a sub-component of the larger company project. However, the example also implies that building a prototype and testing it are considered as constituents of the company project. It is understood that every prototype constructed may not be intended to resolve a technological uncertainty but the example implies that prototype design and manufacture combined with technical specification testing is a company project objective first and an eligible SR&ED component second. We believe this description may over-simplify the product development process most companies use.

It is noted in the example that in most circumstances, companies design and test prototypes to resolve technological uncertainties associated with the company project. We suggest that an additional description indicating that the prototype was used to test the functional specifications of the new microelectronic system would provide increased clarity to the SR&ED project as a whole from conception to completion.

2. Is the language easy to understand (for example, are there words or expressions that should be changed to improve clarity)?

KPMG has not identified any concerns with the language or terms used in this example.

3. Are there any gaps or omissions in the examples?

Example 10 clearly identifies where the SR&ED project begins. However, a gap exists where it is not explicitly stated that eligible SR&ED work was executed during the experimental testing phase of the product with the new miniaturized microelectronics to evaluate the performance criteria of the completed product and to determine success or failure of achieving the required specifications.

Example 10 notes that "Once the specific component was successfully developed, it was incorporated into the existing product without any difficulty and the rest of the development

was accomplished by standard practice." This statement implies that the SR&ED project was limited to only the miniaturization of the microelectronics ("specific component was successfully developed") without regard to the influence of the miniaturization objective on the performance of the overall device, which an experimental evaluation would be required to determine.

We propose including a statement that explicitly identifies that the successful development of the project was determined through an experimental testing phase. Including this statement would clearly identify the conclusion of the SR&ED project.

4. What are the best features of the examples?

The best feature of this example is the clear statement that when the development of a new company product is undertaken, the SR&ED eligible work begins upon the identification of a technological uncertainty that is beyond what would be considered standard development expertise for the company. This example also illustrates that a company can contract an outside source to perform SR&ED eligible work on its behalf.

5. Do you have any other comments or suggestions to improve these examples?

We suggest that it would be beneficial to provide examples that illustrate the initiation of the SR&ED process in its entirety; due diligence, identification of technological uncertainties that cannot be resolved, statement of hypotheses to be tested and what was concluded as a result of the testing.

6. Would you like to suggest new examples?

KPMG does not feel that any further examples are required to illustrate this concept, provided that our suggestions on appropriateness and gaps or omissions are addressed in the current example.

Conclusion

KPMG welcomes the opportunity to contribute to the consultation on this important issue for Canadian corporations. We feel that these examples are important not only to help taxpayers and practitioners understand what should be claimed, but also to help CRA personnel during their interactions with practitioners and taxpayers.

Overall, KPMG notes that a lot of work and effort went into the creation of these examples so that they could have maximum applicability to multiple situations and continue to be relevant into the future.

Addressing the document as a whole, KPMG has two main observations that we hope can be addressed. First, we suggest that it be stated at the beginning of the document or in each example that each of the examples is only meant to illustrate the specific concept that is associated with the example and is not intended to represent other concepts. For example, the detail presented to illustrate the difference between a technical problem and a technological uncertainty should not be used to illustrate a proper systematic investigation; that detail is specific to example 6.

The second observation is that, while this document is intended to be used universally for all claimants and industries on the basis that there are obvious parallels, there will always be some challenges in interpretation. For example, translating an AgriFood example to Computer Science/Information Technology (CSIT) will always present challenges that may result in confusion, misinterpretation and ultimately some inconsistency in the administration of the policy. We are particularly concerned that none of the examples relate to the CSIT field even though this field of science typically has more of the contentious SR&ED eligibility determinations.

We look forward to answering any questions from the CRA about this submission and to providing further comments when new proposals are released.

Appendix: CRA Policy Document

Draft examples to illustrate key concepts in the Eligibility of Work for SR&ED Investment Tax Credits Policy

Note to Readers

These examples are intended to illustrate specific concepts found in the Eligibility of Work for SR&ED Investment Tax Credits Policy. The field of work described is not an issue, nor whether the work is actually eligible.

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Example 1 – Illustrating concepts from paragraph 3, section 2.1.1 Eligibility of Work for SR&ED Investment Tax Credits Policy

This example shows the difference between a technical problem and a technological uncertainty.

Example

Case 1 – Technical problem

A chemical company is developing a new process for producing one of their chemical products. One of the components of the process is a series of pumps. However, the pumps started corroding after six months rather than after the expected life of 10 years. The pump supplier was contacted about the problem. They carried out an investigation and traced the problem to an intermittent leak in a filter that allowed corrosive liquid into the unit. The problem was corrected by replacing the filters in the pumps.

In this scenario, the problem with the pumps in the new process was technical and not technological. The technical problem was resolved using standard practice (the company's trouble-shooting procedures) to find the cause of the corrosion and the problem was solved by replacing the filters.

Case 2 – Technological uncertainty

Consider a different scenario where a set of pumps fails after six months rather than after the expected life of 10 years. The pump supplier was contacted about the problem. They investigated by following their trouble-shooting guide and found that the failure was due to a leak in the seal on the shaft of the pump, which allowed corrosive liquid into the unit. They replaced the seals in all the pumps, but the pumps failed again after six months. Again, the pump supplier found that the cause of the failure was the same.

They investigated further and discovered that the temperature of the shaft after a prolonged period of operation exceeded the maximum recommended operating temperature of the seal material. They also found that the failure of the seal was partly caused by the design of the seal on the shaft as well as the material used for the seal. Under prolonged operation, the seal failed and allowed the corrosive liquid into the unit.

Once the cause of the problem was discovered, the supplier began an experimental development project to find out which of several redesigns of the seal and seal materials would be compatible for the operating environment of the pump. Data on the behaviour and physical properties of the seal materials at much lower temperature ranges were available from the manufacturers. However, there was no information or data available on the corrosive behaviour of materials or their physical properties at the elevated temperatures in the environment that the pump is operating. The supplier undertook a series of experiments to investigate the material behaviour and seal design.

In this scenario, the pump supplier faces technological uncertainties (design of the seal and material behaviour at operating conditions) and undertook experimental development work to resolve them.

Conclusion

This example illustrates the difference between a technical problem that can be resolved by applying practices, techniques, or methodologies that the company knows about or that are

available in the public domain, and a technological uncertainty that requires experimental development.

Example 2 – Illustrating concepts from paragraphs 1 and 2, section 2.1.1 Eligibility of Work for SR&ED Investment Tax Credits Policy

This example shows that technological uncertainties may arise from limitations in current technology, and technological uncertainty exists when it is not known whether a given result or objective can be achieved or how to achieve it based on generally available scientific or technological knowledge or experience.

Example

The current technology of extracting oil from oilseeds is based on a batch process, in which seeds are crushed, conditioned, and flaked. The residue after removing the oil consists mainly of protein-rich flour and seed coats with some trapped oil. This residue (or meal) is then ground and the remaining trapped oil is extracted with a solvent. The solvent is recovered from both the meal and the extracted oil by toasting and distillation. The meal is generally sold as an animal feed product.

The main limitation of the current technology is that the meal is a mixture of the protein-rich flour and seed coats. Seed coats have no nutritional value, and are visually undesirable as a potential ingredient in foods for human consumption. Also, the conditioning and flaking at 80-100°C harms the nutritional value of the oil and the flour. Therefore, there is a need to develop a low-temperature oil-extraction process, including separating protein-rich flour from seed coats, to produce a protein-rich product suitable for human consumption.

The specific technological problem is how to separate the seed coats from the protein flour at low temperature. It is difficult to physically separate seed coats and protein flour because they have very similar physical properties and the protein flour is firmly bonded to the seed coats.

Conclusion

Though there were several technologies available to separate solid particles with different physical properties, no effective low-temperature technologies were available to separate solid particles with very similar physical properties where the particles themselves were bonded together.

One technology which had been tried at a small scale was ultrasonic maceration. However, since there was no publicly available information on the use of ultrasonic maceration for this particular type of oilseed, the operating parameters needed to test the technology were not in the public domain. Also, it was not known whether the continuous process needed on a large scale, including the ultrasonic maceration and simultaneous solvent extraction, could be developed. There was technological uncertainty in developing a continuous method to process oilseeds at low temperatures because no one knew whether the objective could be achieved and how to achieve it.

Example 3 – Illustrating concepts from paragraph 5, section 2.1.1 Eligibility of Work for SR&ED Investment Tax Credits Policy

This example shows that cost targets are not technological uncertainties, but a technological uncertainty may arise by trying technologically uncertain paths to solve a problem to meet the cost targets.

Example

A company wants to develop an air recirculation system for energy-efficient homes that will permanently remove carbon monoxide. A key component of this system is a module in which carbon monoxide (CO) is converted to relatively harmless carbon dioxide (CO2) at room temperature.

A process is available that uses a tin oxide and platinum catalyst to convert CO to CO2 at room temperature, and the company could develop a product based on this process. However, the high cost of using this process will make the selling price of the product out of reach for consumers. There are other methods to convert carbon monoxide, but they are not effective at room temperature. A key requirement is that the module must operate at room temperature.

To achieve the project objective (a room-temperature carbon monoxide remover), the company has to develop an inexpensive process that operates effectively at room temperature. The technological uncertainty relates to how to convert CO to CO2 at room temperature that does not use the costly process with tin oxide and platinum.

Conclusion

Although the cost target by itself is not a technological uncertainty, a technological uncertainty may arise from the need to avoid using a costly process, even though that process is known to work. The required cost target is also the motivation or reason for the company to undertake work to remove this uncertainty.

Example 4 – Illustrating concepts from paragraph 10, section 2.1.1 Eligibility of Work for SR&ED Investment Tax Credits Policy

This example shows standard practice, which means applying known techniques to a new situation where it is reasonably certain that the technique will achieve the desired result.

Example

After testing a newly developed plant variety, a greenhouse grower feels that there is a chance for commercial success and attempts to find the optimum conditions to maximize production.

Depending on the zone size that can be controlled in the greenhouse, anywhere from 2 to 10 acres is planted with the promising variety. The grower monitors the growth of the crop and, depending on its performance, makes adjustments to guide the crop to optimal production. These adjustments are often called the "development of cultural management strategies or crop husbandry strategies." However, greenhouse growers are aware of optimization techniques for factors such as lighting, temperature, CO2 and humidity. Also, developing and

implementing management protocols for controlling nutrient levels, de-leafing, thinning, and other operational practices are familiar to them.

Conclusion

These well-known and practiced techniques are standard in this industry, as growers are reasonably certain that the techniques, data, and procedures, when applied in this case, would work. So, although the grower may not be certain of the specific parameters, determining them using these approaches is part of the standard practice of this industry. In this case, there is no scientific or technological uncertainty in determining the optimum conditions to maximize production of a new plant variety.

Example 5 – Illustrating concepts from paragraph 1, section 2.1.2 Eligibility of Work for SR&ED Investment Tax Credits Policy

This example illustrates the concept of formulation of a hypothesis to resolve a problem.

Example

The research and development (R&D) department of a company was asked to come up with a solution to improve the bond strength of their premier glue product to compete with another product.

The R&D chemist who was assigned to the project recently came across a published research paper whose authors had used an additive (acting as bonding agent) to increase the bonding strength of two chemicals that belong to the same class of materials as used in the company's premier glue product. However, the conditions (temperature, pressure, humidity) under which the authors used the additive were quite different than those used by the company in manufacturing the glue. The chemist carried out further searches in both scientific and technical publications on the use of this additive but found nothing more. There was no way of predicting whether the additive would work in enhancing the bond strength of the glue considering the conditions under which the glue was manufactured.

The chemist hypothesized that, based on the similarity of the chemical properties of the glue ingredients and the two chemicals used in the research paper, the use of the new bonding agent in the manufacture of the glue under the right conditions should increase the bond strength of the glue.

Conclusion

This example simply illustrates the concept of a hypothesis—an idea, consistent with known facts, that serves as a starting point for further investigation to prove or disprove that idea.

Example 6 – Illustrating concepts from paragraph 7, section 2.1.3 Eligibility of Work for SR&ED Investment Tax Credits Policy

This example shows that when a series of tests are executed without any systematic plan and no attempt is made to analyze the results from each test, it is considered trial and error. Such work is not scientific research and experimental development (SR&ED).

Example

A company that has been involved in preparing food products for several years wanted to develop a low-calorie pocket pizza product. They proceeded by attempting to create the low-calorie pizza based on their knowledge of preparing standard pizza products.

In their first attempt, they used different amounts of sauce, reduced the amount of cheese, and replaced the regular pepperoni with low-fat turkey pepperoni, without changing the layer structure of the pizza. This attempt was considered a failure because the low-fat pepperoni burned during cooking.

The next series of attempts involved preparing and testing a different order of layering the ingredients. This attempt also failed because the large size of the pieces of pepperoni led to undercooking. The third attempt reduced the size of the pepperoni pieces by half. This attempt was somewhat successful, but still not good enough. The fourth attempt reduced the thickness of the low-fat pepperoni pieces. This fourth attempt was considered a success and the company proceeded to commercialize the product.

Conclusion

The only lesson learned from each attempt was that it failed. There was no work at any stage to analyze the results from each trial and take corrective action based on the results. In other words, there was no planned approach, including identifying a technological uncertainty, formulating a hypothesis to eliminate that uncertainty, testing the hypothesis, analyzing the results to draw conclusions, and carrying out more experimentation, if needed. The work described in this example is trial and error.

Example 7 – Illustrating concepts from paragraph 4, section 2.1.4 Eligibility of Work for SR&ED Investment Tax Credits Policy

The following example shows how creating new materials, devices, products, or processes, or improving existing ones, can be achieved with or without technological advancement.

Example

Case 1

The basic design of the potato peeler has not changed for more than 100 years. A company decided to develop a novel peeler by adding a phosphorescent substance to the plastic handle so that it would be easier to find in a dark kitchen drawer. There was no change to the shape of the handle or to the blade. Adding the phosphorescent substance did not entail any change to the molding process and did not affect the physical properties of the handle or the performance of the peeler. While this was a new product, there was no technological advancement in creating this "glow-in-the-dark" peeler.

Case 2

The same company wanted to develop a new potato peeler with the same blade but wanted to modify the handle to make it easier to use. The new handle would be larger, easier to grip, and less likely to slip in the hand of the user. This would be achieved by making it softer yet rigid enough to retain its shape, and its surface would have to be rough enough to prevent it from slipping in a wet hand. It would also have to be dishwasher safe.

The company found that their requirements could not be satisfied with any plastic that was available at the time. They decided to try to use a new polymer.

In developing the new handle, they encountered difficulties in the injection molding process. Using the new polymer in their existing molding process did not produce a handle with the desired physical properties. The company found that the working temperature for the new polymer had to be much higher than what the current molding process was designed to operate at. Eventually, a new injection molding process had to be developed that used the new polymer to produce the product that had the desired physical properties. The acquired know-how to develop the new injection molding process represented a technological advancement for the company.

Conclusion

New products hit the market every day. This example shows that creating a new or innovative product does not necessarily mean that SR&ED work was done.

Example 8 – Illustrating concepts from paragraph 2, section 2.2.1 Eligibility of Work for SR&ED Investment Tax Credits Policy

The following example illustrates the concept that only the amount, size, extent, or duration of work that is necessary for and directly in support of the basic research, applied research, or experimental development work undertaken in Canada is eligible.

Example

A company produces field-hockey sticks in large numbers to supply the world market. The production stage of the sticks mainly consists of a machine that accepts pre-cut lengths of timber and produces the cut forms for further processing.

The company started a project involving experimental development work to integrate an advanced scanning and laser cutting technology to cut and rasp hockey sticks in a single machine. Based on statistical analysis and their in-house knowledge of the existing machinery, the company determined that 500 sticks from the cutting and rasping machine would generate sufficient out-of-tolerance sticks to test and validate, with 95% confidence, that the development could be considered complete and successful.

The company, on receiving a large order, produced 2,000 sticks.

Conclusion

In this case, the testing and data collection associated with cutting and rasping the first 500 sticks is commensurate with the needs and directly in support of the SR&ED work.

Example 9 – Illustrating concepts from paragraph 4, section 2.2.2 Eligibility of Work for SR&ED Investment Tax Credits Policy

This example shows that it is the purpose of the work, rather than the nature of the work, that distinguishes support work from excluded work.

Example

In a chemical plant, one of the daily duties of a lab technologist is to take samples from various points throughout the process, perform various analytical tests, and then enter the results into the plant's database. This database is used by many facets of the organization to monitor, optimize, and control the process.

Case 1

A research chemist for the company accesses the plant database and uses the data in a research project (assume that this is an SR&ED project). Although the data collected and entered into the plant database is useful to (and used for) an SR&ED project, the data collection and testing performed by the lab technologist are done routinely and not specifically for the SR&ED work. In this case, the daily data collection and testing are considered routine data collection and routine testing and cannot be claimed as part of the SR&ED project.

Case 2

A research chemist is carrying out an SR&ED project. Much of the data being used again comes from the plant database. Here, however, the researcher also asks the lab technologist to collect specific samples and run specified tests over and above the work that the technologist routinely performs on a daily basis. For this particular research work, the chemist uses both the data and the results from the daily work of the technologist, as well as the specific work he requested from the lab technologist. In the context of SR&ED, the data collection and testing that the technologist carries out specifically for the chemist's research project are directly in support of SR&ED. However, the data collection and testing the technologist performs on a daily basis, as in case 1, are routine data collection and routine testing and are excluded from the SR&ED project.

Conclusion

This example shows how the same type of work—collecting and analyzing samples in a commercial process—may or may not be SR&ED work depending on the purpose of the work being done.

Example 10 – Illustrating concepts from paragraph 2, section 3.2 Eligibility of Work for SR&ED Investment Tax Credits Policy

This example shows that an SR&ED project usually occurs as a subset of a company project.

Example

A company wanted to develop an improved electronic product by incorporating a specific component that would add a new functionality. The company prepared a project plan including budget, created a new cost centre, and allocated staff to work on the project. The company then proceeded with the technological feasibility study, preparing the technical

specifications, designing, building the prototype, testing, and making the final incorporation of the component into the product before starting the commercial production, marketing, and sales. In this case, the company project encompasses all the activities from initial idea to final product launch.

During development, a problem arose with the size of the new component in relation to the size of the existing product. Knowledge of miniaturization in the field of microelectronics was required to fit the new component into the existing product. The company did not possess that knowledge. As a result, the company contracted out the miniaturization work. The contractor performed SR&ED work on behalf of the company. The work succeeded in reducing the size of the specific component so that it would fit into the current product. Once the specific component was successfully developed, it was incorporated into the existing product without any difficulty and the rest of the development was accomplished by standard practice.

Conclusion

In this example, the SR&ED project encompasses the work done to miniaturize the specific component, which is a subset of the overall company project.

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