



## APPLICATION POLICY

**NUMBER: SR&ED 2004-03**

**SUBJECT: Prototypes, Pilot Plants/Commercial Plants, Custom Products and Commercial Assets**

**DATE: October 5, 2004**

In this paper, legislative references are to the *Income Tax Act* (the Act) and regulatory references are to the *Income Tax Regulations* (the Regulations). Also the term “SR&ED” stands for scientific research and experimental development.

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### **General comments**

This application policy replaces and cancels Application Policy SR&ED 96-07 *Prototypes, Custom Products/Commercial Assets, Pilot plants and Experimental Production* dated July 19, 1996.

For information relating to experimental production and commercial production with experimental development, refer to Application Policy SR&ED 2002-02R *Experimental Production and Commercial Production with Experimental Development Work – Allowable SR&ED Expenditures* dated March 26, 2003.

In this application policy, we refer to “materials”, “materials consumed”, “materials transformed”, and to “ITC recapture”. Application Policies SR&ED 2000-01 *Cost of materials for SR&ED* and SR&ED 2000-04 *Recapture of Investment Tax Credits* discuss these topics.

The CRA definition of the terms *prototypes, pilot plants, custom products and commercial assets* apply in this paper, even though industry may assign different meanings to these terms.

On December 20, 2002, the Minister of Finance released a package of draft technical amendments to the Act. One of the proposed changes is that, under the proxy method, the cost of materials transformed in the prosecution of SR&ED work will be allowed. In this application paper we have reflected this proposal as if it were law.

### **Issue**

The purpose of this paper is to outline the updated position of the CRA with respect to prototypes, pilot plants/commercial plants, custom products and commercial assets, as a result of changes to the Act and Regulations.

The rules for calculating the allowable SR&ED expenditures are different depending on whether the project is the development of a prototype vs. a custom product/commercial asset, or if the project is the development of a pilot plant vs. a commercial plant.

Paragraph (i) of the definition of SR&ED in subsection 248(1) of the Act excludes as SR&ED the work with respect to the commercial production of a new or improved material, device or product or the commercial use of a new or improved process. Accordingly, for projects involving mixed activities (SR&ED and other work) the identification of the SR&ED work and related expenditures is an issue. To apply the provisions of the Act and Regulations, it is necessary to determine the intent for which a particular asset is constructed.

### **Prototypes**

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### Definition

The Act does not define prototypes. However, this term is defined in the glossary of terms set out in Appendix A of Information Circular 86-4 as follows: “A prototype is an original model on which something new is patterned, and of which all things of the same type are representations or copies. It is a basic experimental model possessing the essential characteristics of the intended product.”

From a technological point of view, a prototype is normally understood to be a trial model or preliminary version.

The purpose of prototypes is to test the feasibility of a concept or hypothesis. For example a prototype may be constructed, among other things, to:

- study the behaviour of materials and/or the practicability of the design for manufacturing;
- develop an economically viable process for manufacturing of a new product or for the application of a new manufacturing process; and/or
- improve an existing product or process or modify equipment for new applications.

### Context

A prototype is constructed for its technical or experimental content and not for the purposes of a subsequent use in the business or for sale. Normally, the sale of the prototype is only incidental/secondary to the carrying out the SR&ED work.

In general, a prototype has no lasting value (other than the knowledge acquired from its development). Usually, shortly after its use for SR&ED purposes, the prototype is dismantled, destroyed, scrapped, or shown to have nominal residual value.

Where, however, an asset results from a SR&ED project carried out in conjunction or simultaneously with commercial production, the asset is either a custom product or a commercial asset. Refer to the section “Custom products/Commercial assets”.

It is the responsibility of the claimant to determine if the asset developed is a prototype.

The existence of any of the following may indicate that the asset/unit developed was a prototype:

- non-standard material was used for the construction of the asset/unit;
- the labour cost of producing a copy is less than the labour cost of producing the original; or
- the technologically successful prototype may have been fabricated using methods or materials that are too expensive to be practical for commercialization.

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The existence of any of the following may indicate that the asset/unit developed was not a prototype\*:

- the asset/unit is subsequently sold or used in the business and there are indications that this sale or use was intended when it was being developed);
- work is carried out after successful testing to put the asset/unit into a saleable state or useable state for the business.

\* However, see “copies of prototypes”.

### Series of prototypes

As explained in the Guide *SR&ED Project Definition - Principles*, available on our Web site, the construction of a whole series of prototypes may be involved, as problems are met and either overcome or bypassed. It may be that the original objectives have to be modified significantly or perhaps even changed entirely, depending on the technological opportunities that become apparent.

Further, the design and construction of several units of a prototype to meet the requirements of testing to complete a SR&ED project may be experimental development, whether they are made at the same time, or one following the other. Where the design and construction of the units are considered to be experimental development, each one will be considered to be a prototype, if its only intended use is the testing.

Refer to Expenditure rules below for the treatment of the costs incurred for the design and construction of the prototypes.

### Copies of prototypes

1) The copies are materials

Where the design and construction of the copies are not considered to be experimental development but are to be used for testing, prior to commercial production or use, the copies constructed/ manufactured will be considered to be materials to be used for the tests.

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### **Example**

Supplier Co. is a part supplier. It is developing a new part (prototype) to meet technical specifications required by Manufacturer Co., its main customer. Both companies are dealing at arm's length.

Supplier Co. once the prototype has been developed and constructed makes 100 copies of the prototype and sends them to Manufacturer Co. to be tested on its production line. For the purpose of the example, the testing is eligible support work ("d" of the definition of SR&ED).

Manufacturer Co. pays \$100,000 to Supplier Co. for the copies because it intends to buy the new parts once Supplier Co. starts commercial production.

Supplier Co should treat the copies of the prototype as materials. The fact that it receives \$100,000 for the copies being tested does not change the nature of the expenditure (materials). The copies do not become a custom product, as there is no commercial production yet. Supplier Co. will have to apply the ITC recapture rules on the disposition of the materials provided to Manufacturer Co.

The treatment of the costs incurred for the construction/manufacture of the materials will depend on the facts of the case. Where for example, the materials are used for SR&ED in Canada, the costs of the materials will be allowed under subsection 37(1) of the Act.

Application Policy SR&ED 2000-01 *Cost of materials for SR&ED* will be revised to discuss this issue.

#### 2) Each copy involves incremental SR&ED work

Another situation is the construction of several copies of a prototype, each one involving incremental SR&ED work. The copies may eventually end up being used for commercial purposes. Generally, in such cases, only the first unit/asset constructed could be a prototype. For the copies, only the incremental SR&ED work would be eligible. Refer to the rules applicable to custom products for the treatment of the costs incurred for the construction of the copies.

#### 3) The copies are used for commercial purposes

The construction of several copies of a prototype to meet a need or to establish an inventory of copies after successful testing of the original prototype(s) is not considered to be experimental development. Consequently, the costs related to the construction of these copies will not qualify for SR&ED tax incentives.

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### Multi-company projects

In many industries, the business environment has progressively evolved such that multi-company projects are now commonplace.

For example a prototype can be designed, constructed, tested, and evaluated by both a part supplier and its customer.

This can create problems in the assessment of a project.

Based on the term of the contracts between the parties, it may be difficult to determine whether it is the person who paid the amount or the contractor who is entitled to the ITC, or whether both can claim it on the portion of the work that each performed.

Application Policy SR&ED 94-04 *Definition of "contract payment" in subsection 127(9)* provides assistance in making this determination.

Sometimes a party involved in a multi-company development project by companies dealing at arm's length is only doing support work (work described in paragraph "d" of the definition of SR&ED in subsection 248(1)). In such a case, the corporation performing the support work is not entitled to the SR&ED tax incentives.

In the previous example (copies of prototypes), Manufacturer Co. has no allowable SR&ED expenditures. The work it performs is only done in support of the development work of Supplier Co. and not in support of its own SR&ED work.

### SR&ED technical review report

If there is a review of the claim, the Research and Technology advisor (RTA) should verify if the asset developed is a prototype and/or if there is any eligible incremental SR&ED when copies of a prototype are being produced. The report should reflect the conclusions of the RTA. However, the financial reviewer should alert the RTA if it appears that the RTA may not have been aware of all the relevant factors when reviewing the claim.

### Expenditure rules

A prototype, as defined above, is not an asset constructed for the purpose of being used in the claimant's business or for sale. Therefore, paragraph (i) of the definition of SR&ED in subsection 248(1) is not considered to apply. All of the project costs can be allocated to SR&ED since they are not attributable to any other work.

Since the design, construction, and testing (development) of prototypes fall within the scope of experimental development, expenditures relating to

- the labour involved in developing a prototype, and
- the materials consumed in developing a prototype,

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will qualify for SR&ED tax incentives. The expenditures are treated as expenditures of a current nature all or substantially all of which was attributable to the prosecution of SR&ED.

Materials used in such development are generally consumed in SR&ED, since the prototype usually has no commercial application or limited value once it has been tested.

If capital outlays are incurred (or a payment in kind takes place in exchange for an asset) in the development of a prototype, the capital asset acquired must be all or substantially all attributable to the prosecution of SR&ED work for the outlays (or the fair market value of the asset in respect of the payment in kind) to be eligible SR&ED expenditures. This would require that the capital asset to which the outlay relates:

- have minimal life expectancy after its involvement in the development of the prototype (i.e. less than 10%); or
- have limited value after its involvement in the development of the prototype (i.e. less than 10%); or
- be used in the performance of other SR&ED after its involvement in the development of the prototype.

### **Sale of a prototype**

Usually the proceeds from the sale of the prototype are less than 10% of the SR&ED project expenditures. The sale is considered to be a sale of scrap materials and will be included in income under section 9 of the Act. As stated in Application Policy SR&ED 2000-04R2, *Recapture of Investment Tax Credit*, by administrative policy, the ITC recapture rules will not be applied in the case of scrap sales.

### **Pilot Plants**

For comments regarding pilot plants used in the oil and gas and mining industries refer to Application Policy SR&ED 95-02 *Science eligibility guidelines for the oil & gas and mining industries* and to the *Guidance Document for In-Situ Heavy Oil and Bitumen R&D*, available on our Web site.

### **Definition**

*Pilot Plant* is defined in the glossary of terms set out in Appendix A of Information Circular 86-4.

A pilot plant is a non-commercial scale plant in which processing steps are systematically investigated under conditions simulating a full production unit.

The primary purpose of the pilot plant is to obtain engineering and other data needed to evaluate hypotheses, write product or process formulae, establish finished product technical

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specifications, or design special equipment and structures required by a new or improved fabrication process.

For projects involving the development of a plant that will eventually be a commercial facility or the modification of an existing commercial plant refer to “commercial plants” below.

### Context

A pilot plant is used solely for its technical or experimental content and not for the purposes of commercial operations.

Pilot plants are used, among other things, to

- resolve the technological uncertainties entailed in scaling up a manufacturing process to commercial scale proportions,
- prove that the initial SR&ED results can work on a larger process scale, and
- carry out extensive testing and analysis to prove or validate the system's performance.

It is the responsibility of the claimant to determine if the plant qualifies as a pilot plant.

Operating a pilot plant usually results in experimental production (EP) and not in commercial production with experimental development (CP+ED). Refer to Application Policy SR&ED 2002-02R *Experimental Production and Commercial Production with Experimental Development Work - Allowable SR&ED Expenditures* for the expenditures rules for EP.

### Size of Pilot Plant

The actual size or capacity of the facilities and equipment is not a factor, to the extent that it remains a non-commercial scale plant. The pilot plant facility and equipment may be larger than the actual commercial facility or equipment in another company. What is important is the determination, based on the facts, of the actual use made of the facilities and equipment. These must be used to resolve technological uncertainties and achieve a technological advancement, if the associated work is to be considered as SR&ED.

Also, from a cost management point of view, some components may be over-built simply because the incremental cost is relatively small, or the SR&ED plan contemplates increasing or extending the amount of equipment for various stages of the experimentation.

The CRA does not insist on the construction of a small plant if a larger one is more cost effective. The onus is on the claimant to justify the size of the plant relative to the technological uncertainty to be resolved.

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### SR&ED technical review report

If there is a review of the claim, the Research and Technology advisor (RTA) should verify that the asset developed is a pilot plant. The report should reflect the conclusions of the RTA. However, the financial reviewer should alert the RTA if it appears that the RTA may not have been aware of all the relevant factors when reviewing the claim.

It is recommended that the RTA discuss all projects determined to involve the development of pilot plants with the appropriate National Technology Sector Specialist before the report is drafted.

### Expenditure rules

A pilot plant, as defined above, is not constructed for the purpose of being used in the claimant's business or for sale. Therefore paragraph (i) of the definition of SR&ED in subsection 248(1) does not apply. All of the project costs can be allocated to SR&ED since they are not attributable to any other work. Generally, however, neither the capital costs for the acquisition/construction of a building nor a leasehold interest in a building, qualify for SR&ED tax incentives

Expenses incurred for the development or operation of the pilot plant will qualify for SR&ED tax incentives. The expenditures are generally treated as expenditures of a current nature all or substantially all of which was attributable to the prosecution of SR&ED.

Examples of current expenses include:

- labour used and materials consumed in resolving technological uncertainties;
- labour used and materials consumed/transformed in resolving the technological uncertainties of developing equipment for incorporation in the pilot plant; and
- labour used and materials consumed or transformed in operating a pilot plant.

In certain cases, the pilot scale SR&ED projects are carried out in facilities contracted from a third party. In such cases, the contract amount may be an allowable SR&ED expenditure.

Capital costs relating to equipment purchased, i.e. "off-the-shelf", or developed for the pilot plant may qualify subject to meeting the all or substantially all (ASA) intent test for SR&ED capital expenditures.

Refer to Application Policy SR&ED 2003-01 *Capital Property Intended to be Used All or Substantially All for SR&ED* for a discussion on the intent test.

Equipment that does not meet the ASA test can be considered to be shared-use equipment provided the SR&ED use requirements for first and second term shared-use equipment are met. This could be the case for example of a machine that is used in a pilot plant but that is intended to be used eventually in a commercial plant. The equipment, in the case of a pilot plant, will not

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be considered prescribed depreciable property in accordance with paragraphs 2900(11)(c) and (d) of the Regulations.

### **Commercial Plants**

#### Definition

Plants may sometimes be built to a commercial scale, or existing commercial plants may be modified so as to test and demonstrate new processes. These plants are not “pilot plants”. However, technological advancement may be sought, and eligible SR&ED may be involved in developing what will eventually be a commercial facility.

#### Context

Although eligible SR&ED may be involved in developing what will eventually be a commercial facility, the plant is also constructed for the purpose of a commercial use or sale. Therefore paragraph (i) of the definition of SR&ED in subsection 248(1) applies. The project costs have to be allocated between the eligible SR&ED work and the commercial work. It is the responsibility of the claimant to make this allocation.

#### SR&ED technical review report

The report should comment on the existence of mixed work, i.e., SR&ED work and commercial work occurring jointly. The extent of the commercial work should be clearly identified in the RTA’s report so that the financial reviewer can exclude any related expenditures that would be included in the SR&ED claim. The financial reviewer should not allocate any cost to commercial work unless there is support for this position in the RTA’s report.

#### Expenditure rules

To determine the allowable SR&ED expenditures for projects involving the development or modification of a commercial facility, the work and the corresponding costs must be separated between eligible SR&ED work and non-SR&ED work. Any costs that would usually be associated with the construction of a commercial plant if the technology had already existed will not qualify for the SR&ED tax incentives. However, work that directly contributes to the attempt to achieve a technological advancement is part of experimental development. Also work with respect to engineering, design, operations research, mathematical analysis, computer programming, data collection, testing and psychological research is included as experimental development if it is "directly in support" of and "commensurate with the needs" of the experimental development being undertaken.

The general framework set out in the recommended approach to address problems which may arise when reviewing projects in which custom products or commercial assets are developed (see below) should be followed to resolve problems involving the development of commercial facilities.

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The following types of costs will qualify for the SR&ED tax incentives when a commercial facility is being developed:

- labour used, materials consumed and materials transformed to resolve technological uncertainties in achieving a technological advancement; and
- labour used, materials consumed and materials transformed to resolve the technological uncertainties of developing equipment to incorporate in the commercial facility.

The production resulting from the operation of a commercial plant will involve expenditures such as labour, materials consumed, and materials transformed into the products. Refer to Application Policy SR&ED 2002-02R *Experimental Production and Commercial Production with Experimental Development Work - Allowable SR&ED Expenditures* for a discussion on the treatment of these costs.

Capital expenditures involved in the development of a commercial facility will not meet the ASA test unless their anticipated use in SR&ED outside the development of the commercial facility is evident.

In addition, the property acquired will be considered prescribed depreciable property in accordance with subsection 2900(11) of the Regulations unless it is intended to be used during its operating time in its expected useful life primarily for SR&ED, or its value consumed primarily in SR&ED. Consequently, equipment acquired to develop a commercial facility will not normally be considered to be shared-use equipment even if the SR&ED use requirements for first and second term shared-use equipment are met.

### **Custom Product/Commercial Asset**

#### Definition

An asset resulting from a SR&ED project carried out in conjunction or simultaneously with commercial production. Such an asset is a custom product if it is developed for sale, or a commercial asset if it is to be used in the claimant's business.

#### General comments

Projects involving the development of custom products or commercial assets usually involve the design and construction of a specialized (customized) product (i.e. "one of kind") or of specialized products produced in small numbers. The assets produced are also of significant value.

For projects involving CP+ED or the production resulting from continuous process improvement, refer to Application Policy SR&ED 2002-02R *Experimental Production and Commercial Production with Experimental Development Work - Allowable SR&ED Expenditures*.

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### Context

When the project is the development of a custom product or a commercial asset, there will be a mix of work (SR&ED and commercial). Only the work associated with the SR&ED could be eligible.

It is quite common in certain industries for companies to construct custom products to meet a customer's technical requirements. Or, a company may construct a product to meet market-dictated technical requirements and that product will be used to replenish its inventory with the intention of an ultimate sale.

Another common practice for companies is to construct an asset (equipment or component parts) to meet their own technical requirements and which are intended for their own commercial operations.

### Determining Eligible Work

The document *Recognizing Experimental Development* that was prepared by a group of industry participants and the CRA discusses key principles and concepts used to recognize experimental development. These principles/concepts are applicable to projects involving the development of custom products or commercial assets.

As explained in the current version of Interpretation Bulletin IT-151 *Scientific research and Experimental Development Expenditures*, projects involving the development of a custom product or a commercial asset that may involve SR&ED work may also involve commercial production work that does not constitute SR&ED under paragraph (i) of the definition of SR&ED in subsection 248(1). To determine the eligible expenditures on SR&ED for such projects, the SR&ED work and the non-SR&ED work should be identified and the project costs allocated between these activities.

Any work that contributes to the effort to achieve a technological advance could be eligible work (e.g., work to identify what had to be built, integrated, and tested).

Non-SR&ED work includes, among other things, standard practice work not related to resolving a SR&ED technological uncertainty, and not leading to technological advancement and any support work that is not commensurate with the needs of, or not directly in support of, the SR&ED project.

It is the claimant's responsibility to identify the SR&ED work and the non-SR&ED work and allocate the project costs accordingly. Documentation must clearly distinguish between work that is routine and is the standard practice of the claimant, and, therefore are ineligible (unless it is commensurate with the needs of the SR&ED project and directly in support of it), from the work that resolves technological uncertainties and results in a technological advancement, and is, therefore, eligible.

### SR&ED technical review report

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The RTA's report should comment on the existence of mixed activities, i.e., SR&ED work and commercial work occurring jointly. The extent of commercial activities should be clearly identified in the RTA's report to enable the financial reviewer to exclude any related expenditures that would be included in the SR&ED claim. The financial reviewer should not allocate any cost to commercial work unless there is support for this position in the RTA's report.

The RTA's report should identify the eligible work, the employees performing the work, the materials consumed/transformed in the prosecution of the SR&ED work, and the materials consumed/transformed in the prosecution of the non-SR&ED work.

The RTA's report should identify any subsequent use or sale of the asset that was developed.

### **General Framework for reviewing Claims**

The following approach is recommended to address any problems which may arise when reviewing work involving projects in which custom products or commercial assets are developed.

1. The RTA should review the major components that were constructed, the work efforts, and the nature of the work in the commercial project. Then the RTA should establish the highest level of the technological uncertainties or advances in the project. The prime focus of the review should be identifying the work where the resolution of the technological uncertainties was a central/prime focus of the project.
2. When reviewing the allocation of project costs on the basis of SR&ED and non-SR&ED work, it is imperative that the financial reviewer obtain a detailed science report identifying both eligible and non-eligible SR&ED work.
3. Where the RTA either has not reviewed the claim, or has not identified any excluded work in the initial review, and where the financial review of the claimant's books and records indicates that excluded work has been claimed, the financial reviewer should ensure that the RTA confirm in writing the existence of excluded work, e.g., commercial production or use, routine data collection or routine testing.
4. Where the work claimed involves the development of a custom product on behalf of someone else, determine the impact, if any, of the "contract payment" rules (see Application Policy SR&ED 94-04 *Definition of "contract payment" in subsection 127(9)*). If it is obvious that any expenditures relating to SR&ED will have to be offset by the application of those rules, inform the claimant accordingly.
5. If the RTA confirms the existence of excluded work in the report and all of the work was claimed by the claimant as being eligible, the claimant in concert with the RTA should isolate the SR&ED work and the claimant should allocate the cost of labour, the cost of material consumed/transformed and the overhead accordingly for verification by the financial reviewer.

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6. In certain cases, the financial reviewer may use an alternative approach to estimate the allowable SR&ED expenditures, if the claimant agrees. This approach and the conditions to use it are described below under “Alternative Approach”. Note that if the claimant does not agree with the use of this approach only the cost attributable to substantiated SR&ED work can be considered for the SR&ED tax incentive.

7. If the existence of excluded work is not confirmed in the RTA’s report, the review of the claim should be made on the basis that all claimed work is eligible for the SR&ED tax incentives. The claimant should allocate the corresponding cost of labour, material consumed/transformed and overhead accordingly for verification by the financial reviewer.

8. Where applicable, the claimant should be formally advised in writing of deficiencies in the technical and financial documentation, how to correct them, and the consequences of not maintaining the documentation. The RTA and the financial reviewer should work on this together

### Expenditure rules

The allowable SR&ED labour costs and overhead costs (under the traditional method only) are determined based on identifying both the SR&ED work and the non-SR&ED work as explained above.

There is an example at the end of this paper to illustrate how to allocate the expenditures between SR&ED and non-SR&ED work for a project involving the development of a custom product.

The allowable SR&ED expenditures incurred for salaries, overhead, contracts and materials (expenses of a current nature) for the development of a custom product or a commercial asset are considered to be SR&ED expenditures of a current nature. The other costs (that are not allowable SR&ED expenditures) are capital expenditures relating to the commercial property developed.

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The cost of materials consumed in the prosecution of SR&ED is an allowable SR&ED expenditure under both the proxy and the traditional methods. Materials in inventory or that form part of a custom product or a commercial asset are not materials consumed in SR&ED.

The cost of materials consumed in the prosecution of non-SR&ED work (e.g. commercial) cannot be claimed for SR&ED purposes.

The cost of materials transformed into a custom product or a commercial asset is an allowable SR&ED expenditure if the materials are transformed in the prosecution of eligible SR&ED work. The expenditures are allowable under subclause 37(8)(a)(ii)(B)(V) under the proxy method or are treated as directly attributable to the prosecution of SR&ED under paragraph 2900(2)(a) of the Regulations, under the traditional method.

The cost of materials transformed into a product does not qualify for the SR&ED tax incentive if the related activity is not eligible work. For example, if the materials are transformed in the prosecution of work that does not contribute to the effort to achieve a technological advance, the costs of these materials is not an allowable SR&ED expenditure.

The RTA's report is a key element in the treatment of materials. The cost of materials cannot be disallowed as SR&ED unless this decision is supported in the report.

The CRA will not automatically allow all of the cost of material transformed and apply the ITC recapture rules in the year of disposition or conversion to commercial use. Rather, only the cost of the materials transformed in the prosecution of SR&ED work will be allowed under subsection 37(1).

When the cost of materials transformed is allowed as a SR&ED expenditure, it implies that the salary or wages incurred for the transformation are attributable to SR&ED work.

The ITC recapture rules will apply to recapture the ITC earned relative to the costs of the materials transformed in SR&ED, or a portion of the ITC, in the year the product is sold or converted to commercial use.

### Alternative Approach

In some cases it is very difficult to apportion expenses between eligible SR&ED work and ineligible commercial work. Further the isolation process of the SR&ED work may be impossible due to the lack of technical documentation (in that case see item 8 in the general framework above). An alternative approach to estimate the allowable SR&ED expenditures of the claimant may be used if the following conditions are met:

- it is impossible to isolate the SR&ED work (i.e., neither the claimant nor the RTA can isolate the work); or

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- the RTA is of the opinion that it is appropriate to use such an approach in the context, for e.g., only a portion of the work can be isolated;

and

- the claimant agrees with the use of this approach

The "incremental costs approach" may represent a practical solution to estimate the costs attributable to the SR&ED work, i.e., the costs incurred to resolve any scientific or technological uncertainties. Under this approach, the allowable SR&ED expenditures correspond to:

- a) The total actual costs of developing the custom product or commercial asset minus the estimated costs that would usually be associated with the production of the property if the technology had already existed.

Plus

- b) An estimated amount representing the costs of materials transformed in SR&ED. See Example 2 of the Appendix.

The RTA should review the estimates if there is a concern about their reasonableness.

This approach provides the overall amount of incremental costs incurred as a result of SR&ED. It is not necessary to show that a specific expenditure item meets the incremental test on its own.

This alternative method can only be used to estimate the allowable SR&ED expenditures if the claimant concurs and signs a waiver of the right to object or appeal under subsection 169(2.2) of the Act. This is because this approach is not founded in law and is only allowed on an administrative basis.

If a claimant does not agree to this condition then we would use our official position of allocating costs to a project based on the SR&ED and non-SR&ED work identified.

### **Mixed contract in arm's length situations**

A claimant (the payer) may contract with another arm's length party (the performer) to perform SR&ED and other work on behalf of the payer, within one contract for one total contract price.

In such a case, where the parties deal with each other at arm's length, the amount of the allowable SR&ED expenditure for the payer will correspond to the portion of the contract amount that can reasonably be considered to be relative to SR&ED, to the extent that the SR&ED is related to the business of the payer and is performed in Canada. The amount of the expenditure is also subject to the rules of paragraph 18(9)(a) of the ITA (see the current version of Interpretation Bulletin IT-151 *Scientific research and Experimental Development Expenditures* for details).

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The allocation of the contract amount between SR&ED and non-SR&ED work may be done in a number of ways. For example, one way is a reasonable allocation based on the fair market value of work performed. CRA will accept the method chosen by the claimant, provided that it provides a reasonable estimate of the SR&ED expenditures.

When the contract is for the development of a prototype, it wouldn't be necessary to allocate the contract amount between SR&ED and non-SR&ED work; all of the work performed would be attributable to SR&ED. However, if the property developed is a custom product or a commercial asset, an allocation must to be made.

### **ORIGINAL SIGNED BY**

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## **Prototypes, Pilot Plants/Commercial Plants, Custom Products and Commercial Assets**

### **Appendix – Example 1: Custom Product Development**

This example is based on the first example provided in Information circular 94-2 *Machinery and Equipment Industry Application Paper*. This is an example of a typical custom product development that contains both SR&ED and non-SR&ED work. The purpose of the example is to illustrate how to allocate the expenditures for salaries and materials between SR&ED and non-SR&ED work. All activities are carried on in Canada.

#### **Objective of the project**

To build a machine that uses electric motors and servos rather than hydraulic power to reduce the mechanical complexity and the size of the machine as well as to enhance the throughput of the machine.

#### **Company background**

ABC, a Canadian company, is a manufacturer of specialty machines using hydraulic power to form steel. These machines are sold to, and used by, customers in a production facility. The company identified an opportunity with one of its customers to develop a product with enhanced capabilities (e.g., productivity and output in pieces per hour). The customer agreed to purchase a machine that met its specifications at a fixed price (regardless of ABC's development costs).

The company was quite certain that these new specifications could not be met using the company's current hydraulic technology. However, the company believed that the new specifications might be met if they replaced the hydraulic drive with an electric one. The electric drive technology represented a new technology to the company. It potentially could be applied to the company's other products.

Based on the following, the company believes that there is eligible SR&ED work (project) within the custom development:

- Electric drive technology represented a new technology to the company, which could have application to other products in its existing product line. The company had not used, and was not aware of electric technology being used in a similar application. In the business context of the company, the success or failure of such an undertaking would represent an advancement for the company. Success would mean an advance in technology (e.g., enhanced capability using electric drive) while failure would mean an advance in technological knowledge (e.g., limitations of electric drive technology as a replacement for hydraulic drive technology in this particular application).
- The company had examined the technical requirements, and by simple testing of existing products, concluded that the specifications could not be met using a hydraulic system. The company then conducted a feasibility study that indicated that an electric drive and an electronic control system might have the capability of meeting the performance requirements. However, it was uncertain that an electric drive and an electronic control system would meet the following goals:

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- physical space: the new drive system must have dimensions of not more than 2m long by 1m wide by 0.5m high;
  - speed: must achieve more than 300 presses per hour because the current hydraulic system is capable of 240 presses per hour;
  - power (electric systems might not be capable of providing sufficient power/force): must be sufficient to form steel parts; and
  - control: drive system must have sufficient control to achieve the mechanical tolerance desired in the pressing.
- The company identified a project team to perform this assignment. A senior electrical technologist who had several years of experience with electric power machinery and the development of hydraulic machinery led the team. He was responsible for developing a project plan and monitoring progress throughout the project.

### **Plan**

The project leader developed a project chart showing key steps and milestone dates. During the development of the plan, the project leader identified the need for outside expertise in the area of electric motors and electronic controls. An independent qualified electrical engineer was contracted to provide the expertise required for the project.

The plan also identified modelling opportunities for a new control system, and for stationary testing of key components. The result of the testing would be to assess the suitability of key components in the final machine design.

### **Analysis/experimentation**

The designer assigned to the project developed the alternative equipment configurations to meet the customer's requirement. By using the company's computer-aided design (CAD) system, design time was minimized, and down loading to computer-aided manufacturing (CAM) and the building of certain components was simplified. Several design iterations had to be made to achieve the physical size constraint. The design iterations were based on the results of the mock-up experiments and the recommendations of the electrical engineer.

In a report, the electrical engineering consultant recommended three possible motors based on the force requirement for pressing the work piece, the speed of the drive system, and the physical size constraint. Each motor had a different speed-torque characteristic. The final selection would be made after experiments were conducted using a scaled-down model of the drive unit and the prototype logic system as the programmable logic controller (PLC). The engineer also developed the functional specifications for the PLC.

The project team assembled a prototype logic system to model the PLC behaviour; the ultimate implementation of this system would be a microchip. Experiments were performed to simulate the fine control required to achieve the mechanical tolerance on the work piece. Several modifications had to be made to the PLC design before the required results were achieved.

The project team also built a scaled-down model of the drive system and coupled it to the prototype logic system to investigate whether sufficient force could be developed to form steel

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parts and to verify the speed of the drive system. The results from these prototype tests would also dictate which electric motor would be selected for the final system. Many tests were performed, and several modifications to the PLC design had to be made before fine control of the drive was achieved. The results of these tests seemed to indicate that the motor that had a mid-range speed-torque characteristic should be the one selected for the final system. However, this could only be confirmed by building and testing the actual system.

### **System construction and testing**

The results from the prototype tests were given to the designer to design the actual system. Various modifications had to be made to the original design configuration to achieve the dimensional specification of the system now that the choice of the motor was made. The new electric drive system using the selected motor and the new control system was constructed, assembled, and retrofitted to an existing hydraulic model. This custom model was then installed at the customer's site and tested against the technological specifications.

The tests showed the need for a number of modifications:

- The control system was too complex; fewer features would make the system simpler for operators to use. The control system was modified to make it simpler to use.
- The control system needed to be modified to eliminate hysteresis due to the inertia of the motor. This problem was not evident in the prototype tests using a scaled-down drive model.
- The drive system appeared to work, but was noisy under high-load conditions. Extensive acoustic damping was required to correct this problem.
- The motion of the drive system was not smooth under load and resulted in unacceptable variances in the mechanical tolerance specification for the pressing. It took several modifications to the drive system before the problem was corrected.
- Several relays had to be replaced with ones with higher ratings, and line filters were added to the control system to eliminate line spikes.
- Initially, the system was operating intermittently. Further investigation showed that dust from the environment was interfering with the operation of some position sensors and interlock switches. The problem was eliminated when dust covers were installed over the sensors and switches.

### **Results and summary**

As a result of the modifications done on-site, the system was finally able to achieve all its technological objectives. Typically, a standard machine (i.e., hydraulic version) is installed and commissioned in a one-week period. Installing and commissioning the electric drive model took six weeks, during which required modifications were made in the field.

### **Identification of the SR&ED project and costs**

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The activities that fall within the "envelope of SR&ED" must be identified since the custom development contains both SR&ED and non-SR&ED activities. Then the costs should be allocated accordingly.

### **The following work and costs are part of the SR&ED:**

Activity	Salaries	Materials consumed	Materials transformed
Project management of the SR&ED project, time only (support activity)	\$10,000		
Technological planning, time only (support activity)	5,000		
Design of alternative equipment configurations and iterations to meet physical constraint requirement, time only (support activity and resolving technological uncertainty)	5,000		
Outside consultant study (support activity) <sup>1</sup> SR&ED contract	10,000 <sup>1</sup>		
Prototype logic system to model the PLC behaviour, including experiments to simulate the fine control of the drive and modification to the PLC design, both time and materials consumed (resolving technological uncertainty)	4,000	14,000	
Construction of scaled-down model of drive system and investigations of sufficiency of force to form steel parts and speed of system, both time and materials consumed (resolving technological uncertainty)	6,000	17,000	
Testing at customer's site to meet technological specifications (validating and demonstrating technological advancement) including modification work on the control system to eliminate hysteresis, and modification work on the drive system to correct uneven motion under load, both time and materials consumed (resolving technological uncertainties required to achieve technological objectives)	3,000	7,000	
Other activities relating to the new drive and the new control system, time and materials consumed (resolving technological uncertainties)	4,000	2,000	
Construction and assembly of new drive including new electric motor, time and materials transformed	9,000		50,000
Construction and assembly of new electronic control system, both time and materials transformed	9,000		45,000
Total allowable SR&ED expenditures \$200,000	65,000	40,000	95,000 *
* The ITC recapture rules will apply when the machine is sold			

### **Work and costs that are not considered to be part of the SR&ED project**

Activity	Salaries	Materials consumed	Materials transformed

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Construction and assembly of all other components of the machine, both time and materials transformed (not for the purposes of resolving technological uncertainties)	\$24,000		250,000
The activities relating to the interface between the new drive and the existing components (did not involve any technological uncertainty, and, therefore, fell outside the "envelope of SR&ED")	4,000		
Final design (the last redesign using the results of the last prototype test) of the actual system (a one-time routine engineering activity related to commercial activity)	5,000		
The acoustic damping work during testing at customer's site, both time and materials (standard practice not related to resolving technological uncertainty)	4,000		
Control system modification to make it simpler to use, both time and material (standard practice not related to resolving technological uncertainty; not required to achieve technological objectives, but required to satisfy customer's need)	3,000		10,000
All work related to replacing relays and installing line filters during testing at customer's site, both time and materials (trouble-shooting and debugging not related to resolving technological uncertainty)	5,000	5,000	10,000
All work related to investigating intermittent operation due to dust and installing dust covers during test at customer's site, both time and material (trouble-shooting and debugging not related to resolving technological uncertainty)	5,000		5,000
Total expenditures not allowable for ITC purposes (commercial) \$330,000	50,000	5,000	275,000

Note: in reviewing the claim, the RTA has to comment on the commercial activities in the science report. The RTA must also explain why certain materials are transformed in SR&ED and why others are transformed in commercial work.

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### Appendix – Example 2 Alternative Method

Situation: Custom product development. A client ordered a machine with an improved engine.

Project: Improving engine in the machine to enhance its throughput. The engine will be developed and incorporated into the machine for testing. Assume that the project is eligible SR&ED.

The eligible work cannot be segregated from the commercial work. The claimant and the RTA decide to use the alternative method to estimate its SR&ED expenditures and the claimant waives its right to object or appeal under subsection 169(2.2) with respect to this issue.

It was determined that it would cost \$125,000 to develop and construct that machine now that all of the technological uncertainties have been resolved.

The claimant estimated that the cost of materials transformed in the improved engine, which is the subject of the SR&ED project, is \$30,000. The RTA found this amount to be reasonable.

Total costs incurred to construct the machine:	\$ 150,000
Costs of the commercial asset if the technology had already existed	<u>125,000</u>
Allowable SR&ED costs	\$ 25,000
<u>Plus</u>	
Cost of materials transformed in SR&ED	<u>\$30,000</u> *
Total allowable SR&ED expenditures	<u>\$55,000</u>

\* Subject to ITC recapture.