



SR&ED Newsletter Edition 2013 – 1

Defining the SR&ED Project

Recent developments to Scientific Research & Experimental Development (SR&ED) project management & tax credit claims.

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CRA SR&ED Guidance The Consolidated Document

On December 19, 2012 the CRA released a consolidated document to replace all prior:

- Interpretation Bulletins (IT's)
- Information Circulars (IC's) &
- Application Policy Papers (APP's)

While the CRA claims that this change does not represent any new policies they do provide clarification on certain issues and in some cases remove ambiguities among former documents.

Perhaps the most significant “new” analysis is an attempt to correlate;

- The **CRA's 3 component eligibility** criteria to
- the **5 criteria** used by the **Tax Court of Canada**

Income Tax Act definition of SR&ED

SR&ED is defined for income tax purposes¹ as follows:

“Scientific research and experimental development means systematic investigation or search that is carried out in a field of science or technology by means of experiment or analysis and that is

- (a) basic research,..
- (b) applied research,.. or
- (c) experimental development,

namely, work undertaken for the purpose of achieving technological advancement for the purpose of creating new, or improving existing, materials, devices, products or processes, including incremental improvements thereto,...

CRA definition of a “SR&ED project”

“To establish whether or not the work you claim is eligible, we have to examine eligibility at the project level. You must present your claim showing your work organized as SR&ED projects.”

“A SR&ED project consists of a set of interrelated activities that meet the three criteria of SR&ED defined in the current version of *Information Circular 86-4, Scientific Research and Experimental Development*.

This means that the set of activities must be necessary for:

1. The attempt to achieve specific scientific or **Technological Advancement**
2. Overcome scientific or **Technological Uncertainty**, and
3. Must be pursued through a systematic investigation by means of experiment or analysis performed by qualified individuals.”²

Notable quote:

"The impossible is often the untried."

- J. Goodwin

¹ in subsection 248(1) of the Act

² Excerpts from CRA form T4088 - the Guide to completing an SR&ED claim

Tax Court of Canada – Outlines SR&ED Process

In the landmark SR&ED tax case of Northwest Hydraulics the judge stated 5 questions which have become the basis for evaluating SR&ED projects:

1. Is there a technical risk or **uncertainty**?
2. Did the person claiming to be doing SRED formulate **hypotheses** specifically aimed at reducing or eliminating that technological uncertainty?

This involves a **five stage process**:

- i. The observation of the subject matter of the problem;
- ii. The formulation of a clear objective;
- iii. The identification and articulation of the technological uncertainty;
- iv. The formulation of an hypothesis or hypotheses designed to reduce or eliminate the uncertainty;
- v. The methodical and systematic testing of the hypotheses.

3. Did the procedures adopted accord with established and objective **principles of scientific method**, characterized by trained and systematic observation, measurement and experiment, and the formulation, testing and modification of hypotheses?

4. Did the process result in a **technological advance**, that is to say an advancement in the general understanding?

5. Although the Income Tax Act and the Regulations do not say so explicitly, it seems self-evident that a **detailed record** of the hypotheses, tests and results be kept, and that it be kept as the work progresses

The CRA has addressed these questions and attempted to correlate them with **their own 3 step format** as illustrated on page 5.

Role of the “Expert Witness”

As a background to his decision, the Federal court judge in the case of RIS Christie³ provided an overview of the **role of the scientists** in determining SR&ED eligibility stating,

“What constitutes scientific research for the purposes of the Act is either a **question of law** or a question of mixed law **and fact to be determined by the Tax Court of Canada, not expert witnesses**, as is too frequently assumed by counsel for both taxpayers and the Minister.

An expert may assist the court in evaluating technical evidence and seek to persuade it that the research objective did or could not lead to a technological advancement. But, at the end of the day, the **expert’s role is limited to providing the court with a set of prescription glasses through which technical information can be viewed** before being analyzed and weighed by the trial judge.”




Notable quote:

“The only way to discover the limits of the possible is to go beyond them into the impossible.”

- A.C. Clarke

³ RIS Christie v. The Queen [1996] E.T.C. 537 (TCC), [1999] E.T.C. 2004 (FCC)

Project Template

I		<u>OBJECTIVE BEYOND STANDARD PRACTICE</u>	<u>Recommended documentation</u>	<u>GOAL: prove to Government (CRA, IRS, patent office)</u>
	i)	State of Existing technology	State benchmarking methods & sources	Limits of information available to someone "skilled in the art."
	ii)	Objective(s)	Top 5 measureable "Objectives"	Quantifiable Objectives beyond known limits
II		<u>TECHNOLOGICAL UNCERTAINTIES</u>	Top 5 "Variables" for experimentation	Formulate "test matrix" to test hypotheses
III		<u>EXPERIMENTAL ACTIVITY</u>	<u>Defined by tax year*</u>	
	i)	Experimentation method	Number of alternatives tested & how?	Justify sample sizes
	ii)	Results	Correlate to "Objectives"	Provide basis for Conclusions
	iii)	Conclusions	Correlate to "Variables"	"New knowledge" illustrates "Technological Advancement"

Defining the “Scientific Method”

The classical definition in the *Oxford English Dictionary* states:

“The scientific method is a method of procedure that has characterized natural science since the 17th century, consisting in

- **systematic observation,**
- **measurement,**
- **experiment, and the**
- **formulation, testing, and modification of hypotheses.**”

A linearized, pragmatic scheme **list is offered below.**”

A modern update from *Wikipedia*:

“Scientific method refers to a;

- body of **techniques**
- for investigating phenomena,
- **acquiring new** knowledge, or
- **correcting & integrating previous knowledge.**

To be termed **scientific**, a method of inquiry must be based on gathering empirical and **measurable evidence** subject to **specific principles of reasoning.**”

WHAT INFORMATION IS REQUIRED	HOW TO PROVIDE INFO.
Scientific Method Oxford Dictionary	RDBASE SR&ED project - 5 Steps
1. Define a question	Step 1b): Objectives > Standard Practice
2. Gather information and resources (observe)	Step 1a): Define Standard Practice (SP)
3. Form an explanatory hypothesis	Step 2): Correlate research to Uncertainties
4. Perform an experiment and collect data,	Step 3a): Work done “systematically”
5. Analyze the data	
6. Interpret the data and draw conclusions that serve as a starting point for new hypothesis	Step 3b): Clarifying “technological conclusions”
7. Publish results	Recommended but not required for SR&ED projects
8. Retest (frequently done by other scientists).	
Note: The iterative cycle inherent in this step-by-step methodology goes from point 3 to 6 back to 3 again	Provided via steps 2 & 3

SR&ED Project Eligibility – TCC vs. CRA Requirements

WHAT INFORMATION IS REQUIRED		HOW TO PROVIDE INFO.	Author's Commentary: HOW to meet all requirements
Tax Court of Canada (TCC) 5 SR&ED eligibility Questions	CRA interpretation 3 Criteria	RDBASE SR&ED project - 5 Steps	
1. Was there a scientific or a technological uncertainty —an uncertainty that could not be removed by standard practice ?	2. Scientific or technological uncertainty	Step 1a): Define Standard Practice (SP) Step 1b): Objectives > Standard Practice & Step 2): Correlate research to uncertainties	The TCC question contemplates the first 3 steps of the RDBASE SR&ED project structure.
2. Did the effort involve formulating hypotheses specifically aimed at reducing or eliminating that uncertainty ?	3. Scientific & technical content	Step 2): Correlate research to uncertainties	Hypotheses require " variables " for experimentation. These create the basis for the " controlled experiments " required by the tax court.
3. Was the adopted procedure consistent with the total discipline of the scientific method , including formulating, testing, and modifying the hypotheses?	3. Scientific & technical content	Steps 1-5: Specifically 3a): Work done "systematically"	The " scientific method " is an internationally accepted definition which the Tax Court of Canada has adopted despite resistance by the CRA . Arguably the " scientific method " contemplates all 5 steps of the RDBASE SR&ED project structure.
4. Did the process result in a scientific or a technological advancement ?	1. Scientific or technological advancement	Step 3b): Clarifying "technological conclusions" = advancements	" Technological advancement " is the " conclusion " after ALL 5 steps to be performed. The tax courts (correctly) recognize this is a " result " but the CRA still requests this as the first step of the reporting process.
5. Was a record of the hypotheses tested and the results kept as the work progressed?	3. Scientific & technical content	Step 2): Correlate research to uncertainties Step 3a): Work done "systematically"	Documentation of experimentation is required by both the "scientific method" & the CRA's "content" criteria.

Step 1 a): Ensure Proper Definition of Existing Knowledge at the Outset

Northwest Hydraulics Case⁴

CRA position (all work SP):

“Standard Practice refers to directly adapting a known engineering or technological practice to a new situation when there is a high degree of certainty that the known technology or practice will achieve the desired objective.

The devices and processes developed by NHC in the course of the modelling work may have been "new" in the sense of a new location (i.e. a hydraulic structure that was not there before, or the implementation of a river improvement scheme), but all of the work described in the NHC project reports refers to **standard devices and processes**, which are routinely used in similar design situations all over the world.”

Judge’s analysis:

“Q. Could these designs have been implemented by resorting merely to textbooks?

A. No, you wouldn't find any of that in a textbook. But there are design guides available and certainly there are **suggestions** there and these were used in the **initial design**. But not enough is available there to, I think, develop an effective design of this type.

It is true that any one of the features of the final design may have been known - rubber weirs, radial gates and walls of different types were known. It was the innovative **combination and alignment** of these factors that makes this project unique.”

Judge’s ruling & rationale:

“The CRA’s position, was essentially that the appellant, admittedly a **world leader in the field** of hydraulic model testing, by its own excellence **sets the standard for what represents routine engineering or standard practice**.

With respect I think that this sets an **unrealistically high standard** - indeed a standard of perfection that would discourage scientific research in Canada.

Author’s commentary:

The Northwest Case illustrates how CRA officials may deny claims on the basis the project:

- appears to be “routine engineering”
- without providing support for their position but
- identification of “variables” for experimentation
- provide adequate evidence for the TCC.

Notable quote:

"If GM had kept up with technology like the computer industry has, we would all be driving \$25 cars that got 1000 MPG."

- Bill Gates

⁴ Northwest Hydraulic Consultants Ltd., v The Queen, (Date: 1998/05/01 – TCC, Docket: 97-531(IT))

US/IRS Directives: Perhaps CRA Can Adopt?

In the United States the IRS⁵ provides additional directives for determining “**standard practice**” within SR&ED claims.

Means of discovery: In seeking to obtain knowledge that exceeds, expands, or refines the common knowledge of skilled professionals in a particular field of science or engineering, a taxpayer may employ existing technologies in a particular field and may rely on existing principles of science or engineering.

Patent safe harbor: The issuance of a patent by the Patent and Trademark Office... is **conclusive evidence** that a taxpayer has obtained knowledge that exceeds, expands, or refines the common knowledge of skilled professionals. However, the issuance of such a patent is **not a precondition** for credit availability.

Rebuttable presumption: If a taxpayer demonstrates with credible evidence that research activities were undertaken to obtain the information ... would exceed... the common knowledge of skilled professionals in the particular field of science or engineering activities ... satisfy the requirements.

The Commissioner (IRS auditor) may **overcome the presumption** [if he/she] demonstrates that

- the information was within the **common knowledge** of skilled professionals **or**
- the research **activities** were **not** undertaken **to obtain** the information described.

⁵ Internal Revenue Service 26 CFR Parts 1 and 602 [TD 8930] RINs 1545-AV14 and 1545-A051

Step 1 b): Quantification of Objectives vs. Standard Practice

Sass Manufacturing Case⁶

Tax Court of Canada states:

“Systematic investigation connotes the existence of **controlled experiments** and of **highly accurate measurements** and involves the **testing of one's theories against empirical evidence**.”

Northwest Hydraulics Case⁷

Tax Court of Canada states:

“The addition of these words [“including **incremental improvements** thereto”] in 1995 applicable to taxation years ending after December 2, 1992 appears to have been in response to a concern that the achievement or attempted achievement of **slight improvements** was not covered.

I should not have thought it was necessary to say so. Most scientific research involves **gradual, indeed infinitesimal, progress**. Spectacular breakthroughs are rare and make up a very small part of the results of SR&ED in Canada.”

⁶ Sass Manufacturing Limited v. M.N.R., 88 DTC 1363

⁷ Northwest Hydraulic Consultants Ltd., v The Queen, (Date: 1998/05/01 – TCC, Docket: 97-531(IT))

Step 2: Correlate Experiments to Technological Uncertainties (Hypotheses):

Tax Court Definitions of “Hypotheses”

Tax Court of Canada judges have made the following statements:

CW Agencies⁸:

“The word hypothesis in this context is normally considered to mean a **provisional concept** which is not inconsistent with known facts and **serves as a starting point for further investigation by which it may be proved or disproved objectively.**”

Maritime Ontario Freight Lines⁹:

“A hypothesis is a **tentative assumption or explanation to an unknown problem** and, as a rule, this requirement is met by the existence of a **logical plan** devised to observe and **resolve the hypothetical problem.**”

Northwest Hydraulics:

“I do not think that **conventional engineering** would be adequate to deal with the **variables** and the uncertainties that were inherent in the major disruption and diversion of the flow of the river resulting from the construction”¹⁰

“The technological uncertainty is something that **exists in the mind of the specialist** such as the appellant, who identifies and articulates it and applies its methods to remove that uncertainty.”¹¹

Additional Definitions of “Scientific Hypotheses”

Webster’s online dictionary:

1. A supposition; a **proposition or principle which is supposed** or taken for granted, in order to **draw a conclusion** or inference for proof of the point in question;
2. (Natural Science) A tentative theory or supposition provisionally adopted to explain certain facts, and to **guide in the investigation** of others; hence, frequently called a working hypothesis.

Wikipedia:

The term comes from the Greek, *hypotithenai* meaning "to put under" or "to suppose".

A hypothesis (plural hypotheses) is a **proposed explanation for a phenomenon.**

For a hypothesis to be a **scientific hypothesis**, the scientific method requires that one can **test** it.

Scientists generally **base** scientific hypotheses **on previous observations** that cannot satisfactorily be explained with the available scientific theories.

Hypothesis development:

Normally hypotheses have the form of a **mathematical model.**

A **working hypothesis** is a provisionally accepted hypothesis proposed for further research.

⁸ CW Agencies vs. MNR, Date: 2000/08/30, Docket: 98-1324(IT)G, (TCC)

⁹ Maritime-Ontario Freight Lines Limited and Her Majesty the Queen (CITATION:2003 TCC 674) – informal procedure

¹⁰ Ibid NW Hydraulics, Paragraph 22

¹¹ Ibid NW Hydraulics, Paragraph 82

Author's commentary:

Evidence of hypotheses is the development of a "test matrix."

This would require the researcher to:

- Identify the **key variables** which he/she believes explain the performance
- **Benchmark** variables vs. existing models to predict their interaction
- **Rank** the variables in order of significance
- **Test** the variables to further understand shortfall of the existing models

If the **variables of a "test matrix"** can be identified this provides **objective evidence** of the technological advancement.

Conversely, if they can't be identified it will be nearly impossible to illustrate the limits of standard practice models.

Notable quote:

"Life is trying things to see if they work."

- Ray Bradbury

Step 3 a): Ensuring Work Was Done "Systematically"

Sass Manufacturing Case¹²

"Systematic investigation connotes the existence of **controlled experiments** and of **highly accurate measurements** and involves the **testing of one's theories against empirical evidence**.

Scientific research must mean the **enterprise of explaining and predicting** and the **gaining knowledge** of whatever the subject matter of the hypothesis is. This surely would include **repeatable experiments** in which the steps, the various changes made and the **results are carefully noted**."

Zeuter Developments Case¹³

"As stated in RIS-Christie, the only reliable method of **demonstrating** that scientific research was undertaken in a **systematic fashion** is to produce **documentary evidence**."

Rainbow Pipeline Case¹⁴

"What may appear routine and obvious after the event may not have been before the work was undertaken.

What distinguishes routine activity from the methods required by the definition of SRED ... is not solely the adherence to systematic routines, but the **adoption** of the **entire scientific method**, with a view to removing a technological uncertainty through the **formulation and testing of innovative and untested hypotheses**."

¹² Sass Manufacturing Limited v. M.N.R., 88 DTC 1363

¹³ Zeuter Development Corporation v. The Queen, 2006 TCC 549, 2007 DTC 41, para 28

¹⁴ Rainbow Pipeline Company Ltd., Date: 1999/09/15, Docket: 96-4369-IT-G I, (TCC)

Step 3 b): Clarifying the “Technological Conclusions / Advancements”

Rainbow Pipeline Case¹⁵

Q: “Did the process result in a technological advance, that is to say an advancement in the general understanding?”

A: “The **rejection after testing of an hypothesis is nonetheless an advance** in that it eliminates one hitherto untested hypothesis.

Much scientific research involves doing just that. **The fact that the initial objective is not achieved invalidates neither the hypothesis formed nor the methods used.** On the contrary it is possible that the very **failure reinforces the measure of the technological uncertainty.**”

Notable quote:

“An idea that is not dangerous is unworthy of being called an idea at all.”

- Oscar Wilde

Challenging the Science Officer’s Opinion

The legislation:

Subsection 93(3) of the Rules¹⁶ reads as follows:

“The Crown, when it is the party to be examined, shall select a knowledgeable officer, servant or employee, nominated by the Deputy Attorney General of Canada, to be examined on behalf of that party, **but if the examining party is not satisfied with that person, the examining party may apply to the Court to name some other person.**”

This issue was examined in the case of **Blue Wave Seafoods**¹⁷ in which the judge felt the claimant should have challenged the CRA official’s credentials at the **outset of the review** (not after a negative opinion is rendered).

Problems:

Since the tax courts allow such refusals but the CRA typically does not, claimants may be forced to “threaten” litigation for equitable treatment on this issue.

Solutions - Formal vs. Informal Appeal Strategies:

Since the Tax Court of Canada general procedures typically:

- take 2-3 years &
- cost > \$50,000

It may be more efficient to consider an “informal appeal” strategy for a quick and economical resolution.

¹⁵ Rainbow Pipeline Company Ltd., Date: 1999/09/15, Docket: 96-4369-IT-G I, (TCC)

¹⁶ Tax Court of Canada Rules (General Procedure)

¹⁷ *Blue Wave Seafoods Incorporated and D'Eon Fisheries Limited and Her Majesty the Queen (TCC informal procedure – Docket: 2001-2140(IT)G)*

Typical dispute resolution steps & timelines

<u>Step</u>		<u>Parties</u>	<u>Expected timeframe</u>
1	Negotiate with CRA reviewer	CRA & client	30 days
2	2nd admin. review	CRA & client	180 days
3	Objection	CRA & client	365 days
4	Tax Court of Canada		
	a) Appeal - Informal	CRA, Dept. of Justice client	6-9 months
	b) Appeal - General	CRA, Dept. of Justice client	2-3 years

Notable quote:

“The uncreative mind can spot wrong answers, but it takes a very creative mind to spot wrong questions.”

- Anthony Jay

Terms of use

Questions or feedback

We welcome your questions or feedback on any issues raised in this letter.

We also encourage interested parties to examine:

- past SR&ED newsletters
- SR&ED tax guide [the Guide to RDBASE.NET],
- “RDBASE.NET” online SR&ED tracking software &
- additional tutorials re. eligible SR&ED activities at

Although we endeavor to ensure accurate & timely information throughout this letter, it is not intended to be a definitive analysis of the legislation, nor a substitute for professional advice.

Before implementing decisions based on this information, readers are encouraged to seek professional advice, in order to clarify how any issues discussed herein, may relate to their specific situations.

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