

# SR&ED Scientific Research & Experimental Development Tax Credits

## Crash Course - 2013

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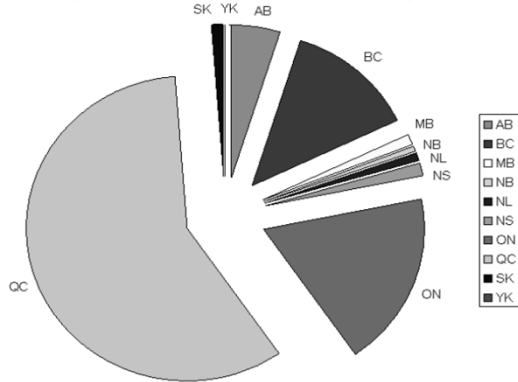
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Budgeted Expenditures for R&D Tax Credits		
	2008 Expenditures	
	(\$ Millions)	
<b>Federal</b>		
Earned & Claimed in Current Year	3,000	
Claimed Current Year but Earned in Prior Years	1,655	
Earned current year but carried back to prior years	100	
<b>Total</b>	<b>4,755</b>	<b>4,755.0</b>
<b>Provinces / Territories</b>		
AB	60	
BC	150	
MB	15	
NB	4.6	
NL	12.1	
NS	14	
ON	215	
PEI	0	
QC	689	
SK	12	
YK	0.2	
NWT	0	
NV	0	
<b>Total</b>		<b>1,171.9</b>
<b>Total Expenditures in Canada</b>		<b>5,926.9</b>

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Expenditures for R&D ITC's by Province and Territory



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Credits Earned by Rate

By Value of Credits - \$ millions				By Number of Corporations			
Earned at 35% rate	Earned at 20% rate	Total credits earned		Earning at 35% rate	Earning at 20% rate	Earning Both 35% & 20% rates	Total corporations earning credits
2002	865	2,397	3,262	11,603	4,133	325	16,061
2003	954	2,238	3,193	13,418	4,309	339	18,066
2004	1,083	2,271	3,354	15,295	4,051	339	19,685

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Distribution of Credits Earned by Corporation Size				By Number of Corporations			
	By Value of Credits			By Number of Corporations			
	2002	2003	2004	2002	2003	2004	
% of total credits earned							
% of total corporations earning credits							
CCPCs, by taxable income (\$000)							
0 - 400	31.7	34.8	35.6	79.1	80.8	81.8	
400 - 600	0.7	0.9	1.2	1.9	2.3	2.4	
600 - 1,000	0.9	0.8	1.0	2.0	1.8	1.9	
1,000 +	4.7	4.2	4.4	4.4	4.0	4.1	
Total CCPCs	38.1	40.8	42.1	87.4	88.9	90.1	
All other corporations	61.9	59.2	57.9	12.6	11.1	9.9	
Total	100.0	100.0	100.0	100.0	100.0	100.0	
CCPCs, by taxable capital (\$000,000)							
0 - 10	31.3	35.0	n/a	82.8	84.7	n/a	
10 - 15	1.3	1.1	n/a	1.5	1.5	n/a	
15 - 25	1.4	1.2	n/a	1.4	1.1	n/a	
25 - 50	2.0	1.3	n/a	1.0	0.9	n/a	
50 - 75	0.5	0.5	n/a	0.3	0.3	n/a	
75 +	1.6	1.7	n/a	0.3	0.3	n/a	
Total CCPCs	38.1	40.8	42.1	87.4	88.9	90.1	
All other corporations	61.9	59.2	57.9	12.6	11.1	9.9	
Total	100.0	100.0	100.0	100.0	100.0	100.0	

Note: Due to changes in reporting requirements, detailed breakdowns by taxable capital are not available for 2004.

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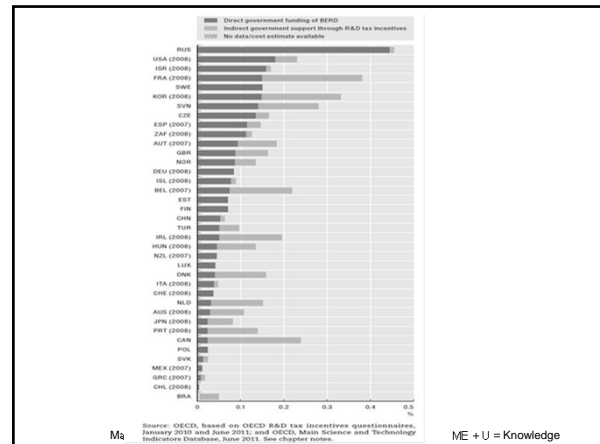
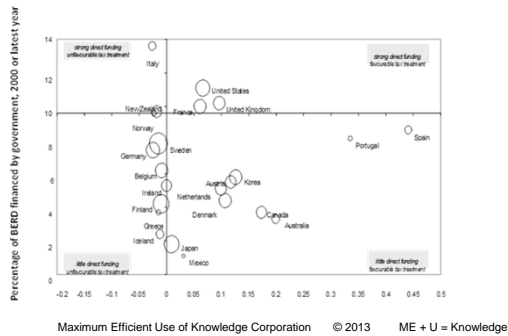
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Distribution of Credits Earned by Sector						
	By Value of Credits			By Number of Corporations		
	2002	2003	2004	2002	2003	2004
<b>Industrial Sector</b>	% of total credits earned			% of total corps. earning credits		
Agriculture, forestry, fishing	1.4	1.6	2.1	7.1	9.0	10.3
<b>Manufacturing</b>	<b>47.0</b>	<b>47.7</b>	<b>47.6</b>	<b>41.7</b>	<b>41.2</b>	<b>40.5</b>
Construction	0.6	0.7	0.7	2.4	2.4	2.5
Transportation/warehousing	0.5	0.4	0.3	0.7	0.7	0.7
<b>Information/cultural industries</b>	<b>12.9</b>	<b>11.8</b>	<b>11.6</b>	<b>3.6</b>	<b>3.4</b>	<b>3.1</b>
Utilities	0.1	0.1	0.1	0.1	0.1	0.1
Wholesale trade	4.2	4.7	4.6	7.3	7.4	7.8
Retail trade	0.8	0.8	0.8	1.6	1.7	1.7
Financial intermediaries	1.0	1.3	1.3	1.3	1.3	1.4
Management companies	0.6	0.4	0.5	1.1	1.0	1.0
<b>Other services</b>	<b>27.8</b>	<b>27.3</b>	<b>26.7</b>	<b>30.7</b>	<b>29.6</b>	<b>28.7</b>
Oil and gas	2.3	2.5	2.7	1.0	0.9	0.8
Mining	0.4	0.7	0.5	0.3	0.3	0.2
Other	0.2	0.3	0.6	0.8	1.0	1.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

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## International comparatives



## International definition of an R&D project

- “For a ... project to be classified as R&D, its completion must be dependent on a scientific &/or **technological advance**, the aim of the project must be the **systematic resolution** of a scientific and/or **technological uncertainty**.”

• Source: Frascati Manual 2002, paragraph 135

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## B - SR&ED legislation - eligibility

Canada - *Income Tax Act* defines SR&ED as

- “**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

c) Experimental Development \*

\**advancement for the purpose of creating new, or improving existing, materials, devices, products or processes*

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## B - 7-8 types of supporting SR&ED activities – “if commensurate with project needs”

d) Eight areas of supporting work:

- Engineering
- Design
- Operations Research
- Mathematical analysis
- Computer programming
- Data gathering
- Testing and
- (Sometimes - Psychological Research)

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## B - SR&ED does NOT include

- **commercial production, market research or sales promotion,**
- **quality control or routine testing,**
- **social sciences or the humanities,**
- **aesthetic or style changes, or**
- **Claims filed > deadline (18 months from year-end for corporations).**

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## IRS Four part test (USA)

- IRS code 41(d)(1)
- **Technological in nature – then:**
  - Permitted purpose (discovering information)
  - Elimination of uncertainty
  - Process of experimentation

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## B - Eligible Research Fields

### INCLUDE:

- 1) Natural Sciences
- 2) Engineering & Technology
- 3) Medical & Health Sciences
- 4) Agricultural Sciences

### DOES NOT INCLUDE

- Social Sciences
- Humanities

Log-in to [rdbase.net](http://rdbase.net) for project examples

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## B - CRA SR&ED Guides

- Consolidated CRA SR&ED policy papers(s)
  - Released December 19, 2012
  - Replace former IT's, IC's & APP's
  - Do NOT represent change in policies

Additional Manuals for Reviews

- RTA (Technology) &
- FR (Financial)

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## B - CRA Eligible SR&ED project

"Set of interrelated activities that:

- 1. Attempt **technological advancement**
- 2. to overcome **technological uncertainty**,
- 3. Pursued through **systematic investigation by qualified individuals.**"

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## B Phase 1: The Square Define "Standard Practice"

What is known?



## TEMPLATE - THREE COMPONENTS OF AN SR&ED PROJECT – STEP 1:

FORMAT: ITEM:		States of existing technology: Benchmarking methods & sources for citations		
MAX. 550 BYWORDS	I) A) LIST	Number of		
WHAT?	i)	Internet/ Google Searches		
	ii)	Articles		
	iii)	Patent searches		
	iv)	Competitive methods		
	v)	Similar in-house technologies		
	vi)	Potential components		
	vii)	Queries to experts		
	viii)	Other		
B) TABLE Performance Objective(s) (up to top 5)				
		Benchmark 1	Benchmark 2	Benchmark 3
i)	Existing performance			
ii)	Unit of measure			
iii)	Objective			
iv)	Results (III B i) *			

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## Notable quote

"He who asks a question is a fool for 5 minutes. He who does not ask a question remains a fool forever."

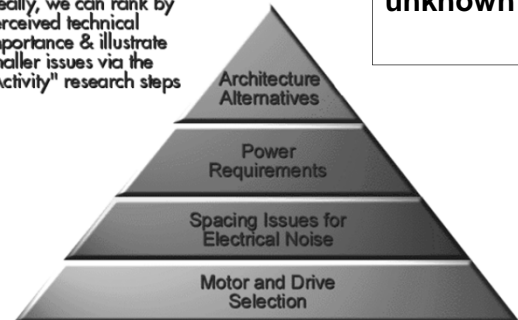
- Chinese proverb

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## B Phase 2: The Triangle Technical Uncertainty (TU)

What is unknown?

Ideally, we can rank by perceived technical importance & illustrate smaller issues via the "Activity" research steps



## TEMPLATE - THREE COMPONENTS OF AN SR&ED PROJECT – STEP 2:

MAX. 256 WORDS	II)	LIST	Technical Uncertainties (up to top 5 variables)
▶	i)	_____	Variable 1
WHY?	ii)	_____	Variable 2 ...
	iii)	_____	Variable 3 ...

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## Notable quote

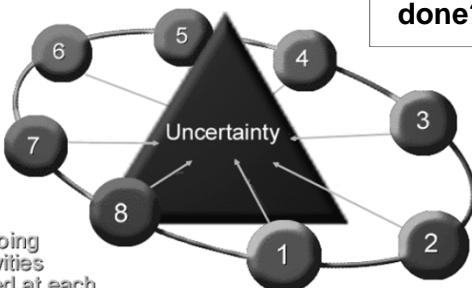
"They always say time changes things, but you actually have to change them yourself."

- Andy Warhol

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## B Phase 3: The Circle of Ongoing Investigation

What was done?



Ongoing Activities aimed at each major uncertainty

## TEMPLATE - THREE COMPONENTS OF AN SR&ED PROJECT – STEP 3:

MAX. 700 WORDS	III	A) LIST	Experimentation method (for EACH activity)
			Number of
	i)	_____	Alternatives analyzed or simulated (Theoretical)
	ii)	_____	Process trial runs (Physical or software)
	iii a)	_____	Complete prototypes (Physical or Software releases)
	iii b)	_____	Revisions to prototypes (in III a)
WHO, WHEN, WHERE & HOW?	B i) TABLE	Results - tie to performance objective benchmark in TABLE I B) above*	
	B ii) LIST	Conclusions - compare Results to expectations & explain in Variables LISTED in II) above**	
	B iii) LIST	Technical documentation retained (list of 12 items per CRA T661 form)	

\* = Software Industry - should classify total lines of code: written vs. scrapped during current period

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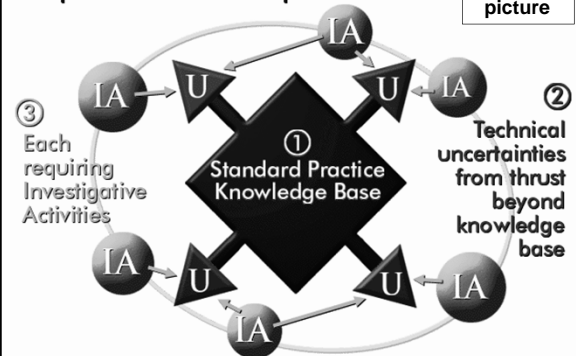
## Notable quote

“The more original a discovery, the more obvious it seems afterwards.”

- Arthur Koestler

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## B The Realm of Experimental Development



### RDBASE.NET International SR&ED template

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

Knowledge

## 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

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## “Defining the SR&ED project” Tax Court vs. CRA Guidance

### CRA SR&ED Guidance – the consolidated document

- Role of the TCC vs. expert witness
- Tax Court outlines the SR&ED process
- Defining the “Scientific method”
- SR&ED project eligibility – TCC vs. CRA requirements

### Project template (simple view)

- Step 1a): Ensure proper definition of existing knowledge at the outset
- Step 1 b): Quantification of objectives vs. standard practice
- Step 2: Correlate experiments to hypotheses
- Step 3a): Ensuring work was done “systematically”
- Step 3b): Clarifying the “technological conclusions / advancements”

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## CRA SR&ED Guidance – the consolidated document

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)
- related to SR&ED credits.

While the CRA claims that it

- does not represent any new policies
- they do provide clarification on certain issues &
- 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 / Scientific Method

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## Notable quote

"There is nothing wrong with change, if it is in the right direction"

- Sir Winston Churchill

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## CRA Eligible SR&ED project

"Set of interrelated activities that:

1. Attempt technological **advancement**
2. to overcome technological **uncertainty**,
3. pursued through **systematic investigation** by qualified individuals."

Note: "Technological Advancement" & "Systematic Investigation" are the only of these terms used in the Income Tax Act.

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## SR&ED definition – Income Tax Act

Canada - Income Tax Act defines SR&ED as

- "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 \*
- \* "Technological advancement" for the purpose of creating new, or improving existing, materials, devices, products or processes

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## Tax Court – SR&ED requirements & 5 step process

Landmark SR&ED tax case of **Northwest Hydraulics** - 5 questions: basis for evaluating SR&ED projects:

1. Is there a **technical risk or uncertainty**?
2. Did the person claiming to be doing SR&ED formulate **hypotheses** specifically aimed at reducing or eliminating that **technological uncertainty**? This involves a five stage process:
  - a. the observation of the **subject matter** of the problem;
  - b. the formulation of a clear **objective**;
  - c. the identification and articulation of the **technological uncertainty**;
  - d. the formulation of an hypothesis or **hypotheses** designed to reduce or eliminate the uncertainty;
  - e. 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.

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## TCC - Role of the "expert witness"

**RIS Christie : role of the scientists in determining SR&ED eligibility**

- "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."


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## Tax Court provides additional "process" suggestions

Landmark SR&ED tax case of Northwest Hydraulics

- Judge's Question #2.
- "Did the person claiming to be doing SR&ED formulate hypotheses specifically aimed at reducing or eliminating that technological uncertainty?  
This involves a **five stage process**:
  - a. the observation of the subject matter of the problem;
  - b. the formulation of a clear objective;
  - c. the identification and articulation of the technological uncertainty;
  - d. the formulation of an hypothesis or hypotheses designed to reduce or eliminate the uncertainty;
  - e. the methodical and systematic testing of the hypotheses."

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

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 resource(s) (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	Step 3b): Clarifying "technological conclusions"
6. Interpret the data and draw conclusions that serve as a starting point for new hypothesis	
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

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WHAT INFORMATION IS REQUIRED	HOW TO PROVIDE INFO.	Author's Commentary:
Tax Court of Canada (TCC) SR&ED eligibility questions	RDBASE SR&ED project - 5 steps	HOW to meet all requirements
1. Was there a scientific or a technological uncertainty—an uncertainty that could not be removed by standard practice?	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?	Step 2: Correlate research to uncertainties	Hypotheses require "variables" for experimentation. These create the basis for the "controlled experiment" 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 hypothesis?	Steps 3-5: 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 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 progresses?	Step 2: Correlate research to uncertainties Step 3a): Work done "systematically"	Documentation of experimentation is required by both the "scientific method" & the CRA's "contest" criteria.

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<h2 style="text-align: center;"><u>Notable quote</u></h2> <p style="text-align: center;">           "The uncreative mind can spot wrong answers but it takes a very creative mind to spot wrong questions."         </p> <p style="text-align: center;">- Anthony Jan</p>
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<h3 style="text-align: center;">Step 1a): Definition of existing knowledge at the outset</h3> <p>Northwest Hydraulics</p> <ul style="list-style-type: none"> <li>• CRA position (all work SP)           <ul style="list-style-type: none"> <li>• "work described ... refers to standard devices and processes, which are routinely used in similar design situations all over the world."</li> </ul> </li> <li>• Tax Court Position           <ul style="list-style-type: none"> <li>• "It was the innovative combination and alignment of [these] factors that makes this project unique."</li> </ul> </li> </ul> <p style="text-align: right;">Maximum Efficient Use of Knowledge Corporation © 2013 ME + U = Knowledge</p>
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<h3 style="text-align: center;">Author's commentary:</h3> <p>The Northwest Case illustrates how CRA officials may deny claims on the basis the project</p> <ul style="list-style-type: none"> <li>• appears to be "routine engineering"</li> <li>• without providing support for their position but</li> <li>• identification of "variables" for experimentation</li> <li>• provide adequate evidence for the TCC</li> <li>• US / IRS directives – perhaps CRA can adopt?           <ul style="list-style-type: none"> <li>• Patent safe harbour</li> <li>• Rebuttal presumption               <ul style="list-style-type: none"> <li>• IRS must demonstrate within common knowledge if denied</li> </ul> </li> </ul> </li> </ul> <p style="text-align: right;">Maximum Efficient Use of Knowledge Corporation © 2013 ME + U = Knowledge</p>
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### Step 1 b): Quantification of objectives vs. standard practice

- Sass Manufacturing
  - "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
  - "Most scientific research involves gradual, indeed infinitesimal, progress."

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### Step 2: Correlate experiments to technological uncertainties (hypotheses)

- CW Agencies
  - "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 Lines
  - "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."

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### Identifying "key variables" within "hypotheses"

- 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"
  - 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."

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### Additional definitions of "scientific hypotheses"

- From Wikipedia, the free encyclopedia
  - 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.
  - Normally hypotheses have the form of a mathematical model.
  - A working hypothesis is a provisionally accepted hypothesis proposed for further research.

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### Author's commentary: Evidence hypotheses via "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

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### Step 3a): Ensuring work was done "systematically"

- Sass Manufacturing
  - 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."

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### Step 3a): Ensuring work was done “systematically”

#### • Rainbow Pipeline

- “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 **SR&ED** .... 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**.”

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### Step 3b): Clarifying “technological conclusions / advancements”

#### • Rainbow Pipeline

- “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.”

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## COMMON DOCUMENTATION PROBLEMS

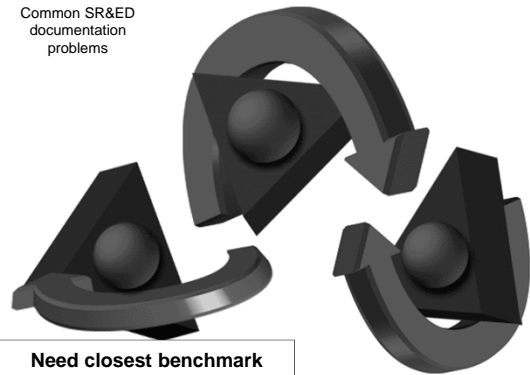
### Optimal implementation:

- Willing contributions of “investigators”
- Ability to identify and rank the relative significance of technical uncertainties
- Ability to provide “conciseness and brevity” by focusing on significant technical issues

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### C 1 - No Standard Practice

Common SR&ED  
documentation  
problems



Need closest benchmark

### C 2 - Routine Engineering

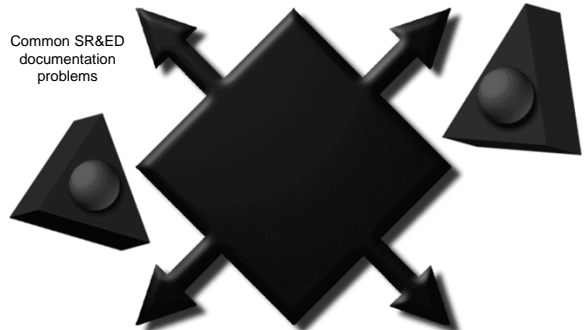
Common SR&ED  
documentation  
problems



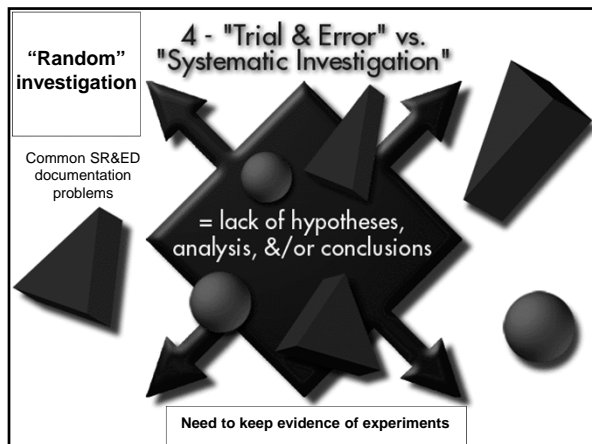
Work must correlate with uncertainties

### C 3 - Activities Beyond Qualifications

Common SR&ED  
documentation  
problems



Need experience in EACH field of science



## Notable quote

"I couldn't repair your brakes, so I made your horn louder."

- Steven Wright

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## Edison Phonograph = Scientific Uncertainty



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## Edison Light Bulb = System Uncertainty



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## SR&ED – "light bulb" lessons

- American inventor Thomas Edison is credited for "inventing" the lightbulb
- Reality = story of "incremental innovation"
- In 1810, British chemist Humphry Davy invented the "electric arc," a precursor to the light bulb.
- A series of innovations followed

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## SR&ED – "light bulb" lessons

- 1860s, race for "commercially viable" light bulb
- 1874 - 2 Canadians, Woodward & Evans patented nitrogen-filled light bulb
  - lasted longer than others BUT no financing
- 1879 - Thomas Edison - successful in obtaining major financial backers
  - continued experiments &
  - bought patents Woodward & Evans + others

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## Key criteria summary

### Technical/financial summary ensuring:

- a) technology benchmarked
- b) activities correlate to uncertainties
- c) conclusions (advancements) cited

See examples per

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## Notable quote

““Innovation is the ability to convert ideas into invoices.”

- L. Duncan

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## CRA DRAFT project examples released Sep 2013

- 1301 Pump redesign
- 1302 Oil seed extraction process
- 1303 HVAC - How cost constraints affect a project
- 1304 Greenhouse management strategy - INELIGIBLE
- 1305 Glue development - Hypotheses formulation example
- 1306 Food development - INELIGIBLE TRIAL & ERROR
- 1307 Potato peeler - WHAT IF SCENARIOS
- 1308 Hockey stick design - SAMPLE SIZE
- 1309 Chemical formulation - DATA COLLECTION SCENARIOS
- 1310 Electronics – SR&ED vs. business portion of the project

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## C – CRA draft projects Sep 18, 2013 Example #1: 1301 Pump redesign

### 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.

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### Case 2 – Technological uncertainty – pump redesign

- 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.

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### Case 2 – Technological uncertainty – pump redesign (ctnd.)

- 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.

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1301 - Pump redesign									
Benchmarks:				Objectives:					
Intermediates: 5 Articles				Minimum operating temperature: 200 Deg C					
Similar prior in-house technologies: 1 products /				PUMP COST: 500 \$					
Potential components: 1 products									
Uncertainty:				Key Variables:		seed design (intakes, thicknesses, angles, seal materials)			
1 - CHARACTERIZATION OF TECHNOLOGICAL UNCERTAINTY									
Activity:		Testing Methods		Results - % of Objective		Variables Controlled		Hours	
1 - Development		Analysis - simulation: 110 iterations		Minimum operating temperature 200 Deg C (15 %)		seed materials		0.00	
		Process trials: 42 runs / samples						0.00	
		Physical prototype: 1 sample						0.00*	
		... prototype releases: 44 releases							

1303 - HVAC - How cost contains affect a project

Benchmarks: (none)

Objectives: Cost 200 \$ / unit  
Minimum conversion temperature 20 Deg C

Uncertainty: 1 - Convert CO2 to CO2 at room temp

Activity	Testing Method	Results - % of Objective	Variables Controlled	Hours	Materials \$	Subcontractor \$	Price/Year
1 - Development	Analysis simulation 22 dimensions	Cost 180 \$ / unit (10%) Minimum conversion temperature 22 Deg C (10 %)	Item to convert CO2 to CO2 at room temp	0.00	0.00	0.00	2013

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1304 Greenhouse management strategy - INELIGIBLE

- 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.

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1304 Greenhouse management strategy (cntd.)

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.

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1304 - Greenhouse management strategy - INELIGIBLE

Benchmarks: Intermediate 1 Acres  
Parameters: 1 plants  
Competitive products or processes: 1 products  
Similar prior technologies: 1 products /  
Potential competitors: 1 products  
Quoted to experts: 1 responses

Objectives: YIELD / ACRE 120 KG

Uncertainty: 1 - Greenhouse optimization

Activity	Testing Method	Results - % of Objective	Variables Controlled	Hours	Materials \$	Subcontractor \$	Price/Year
1 - Crop husbandry	(none)	(none)	CO2 humidity light nutrient levels temperature	0.00	0.00	0.00	2013

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1305 Glue development - Hypotheses formulation

- 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.

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1305 Glue development - Hypotheses formulation

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.

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1305 - Glue development - Hypothesis formulation example									
Benchmarks: 1 item/season/yr \$ 40000 Competition products or processes: 1 product Similar prior in-house technologies: 5 products /				Objectives: BOND STRENGTH 400 KG COST / LITRE 30 \$					
Uncertainty: 1 - Adhesive effects & formulation				Key Variables: adhesive - amount, timing, purity; pressure temperature					
Activity	Testing Methods	Results - % of Objective	Variables Controlled	Hours	Material \$	Subcontractor \$	Recall/Year		
1 - Development	Analysis - simulation 22 staircases	BOND STRENGTH 400 30 (100 %) COST / LITRE 30 \$ (0.00 %)	humidity pressure temperature	0.00	0.00	0.00	2013		

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1306 Food development - INELIGIBLE TRIAL & ERROR									
<ul style="list-style-type: none"> <li>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&amp;ED).</li> </ul>									
Example									
<ul style="list-style-type: none"> <li>A company that has been involved in preparing food products for several years wanted to develop a low-calorie pocket pizza product.</li> <li>They proceeded by attempting to create the low-calorie pizza based on their knowledge of preparing standard pizza products.</li> <li>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.</li> <li>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.</li> <li>The third attempt reduced the size of the pepperoni pieces by half. This attempt was somewhat successful, but still not good enough.</li> <li>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.</li> </ul>									
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1306 Food development - INELIGIBLE TRIAL & ERROR									
Conclusion									
<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>The work described in this example is trial and error.</li> </ul>									
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1305 - Food development - INELIGIBLE TRIAL & ERROR									
Benchmarks: (none)				Objectives: (none)					
Uncertainty: 1 - Business vs. technological uncertainty				Key Variables: ingredient selection, order of ingredients, size / shape of ingredients					
Activity	Testing Methods	Results - % of Objective	Variables Controlled	Hours	Material \$	Subcontractor \$	Recall/Year		
1 - Trial & error development	Process trials - 4 trials / samples / groups	(none)	ingredient selection order of ingredients size / shape of	0.00	0.00	0.00	2013		

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Notable quote									
<p>“Everyone has a photographic memory; some just don't have film”</p> <p>- Steven Wright</p>									
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1307 Potato peeler – WHAT IF SCENARIOS									
<ul style="list-style-type: none"> <li>The following example shows how creating new materials, devices, products, or processes, or improving existing ones, can be achieved with or without technological advancement.</li> </ul>									
Examples									
Case 1									
<ul style="list-style-type: none"> <li>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.</li> </ul>									
Case 2									
<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> </ul>									
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## 1307 Potato peeler – WHAT IF SCENARIOS

Case 2 (contd.)

- 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.

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### 1307 - Potato peeler - WHAT IF SCENARIOS

Benchmarks: Comparable products or processes: 5 products  
Similar prior in-house technologies: 3 products  
Potential components: 12 products

Objectives: Data asser rate: 1200 # cycles  
COST: 1.5 \$/UNIT  
Part roughness (Ra): 1 micro inches  
Area Roughness (Ra): 1.5 micro inches

Uncertainty: 1 - Technological uncertainty-Case 2		Key Variables: selection of injection molding process, optimal polymer material, working temperature				
Activity	Testing Methods	Results - % of Objective	Variables Controlled	Hours	Material \$	Subcontractor \$
1 - Case1 - SHELDABLE	(none)	(none)	(none)	0.00	0.00	0.00*
2 - Case2 - SUDO BLE	Analysis: simulation: 47 drawings Process trials: 11 runs: samples Provided prototype: 1 sample ... prototype revisions: 4 revisions	2.5 micro inches: 1200 # cycles (100 %) COST: 1.5 \$/UNIT (140 %) Part roughness (Ra): 2 micro inches (5 %) Area Roughness (Ra): 1.4 micro inches (120 %)	Material of injection molding process optimal polymer material working temperature	0.00	0.00	0.00*

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## 1308 Hockey stick design - SAMPLE SIZE

- 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.

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## 1308 Hockey stick design - SAMPLE SIZE

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.

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### 1308 - Hockey stick design - SAMPLE SIZE

Benchmarks: Intermediate: 5 Articles  
Similar prior in-house technologies: 1 products /

Objectives: TOLERANCE: 0.3 mm  
PRODUCTION RATE: 3.5 units / minute  
REJECT RATE: 1 %

Uncertainty: 1 - Design		Key Variables: LASER POSITION, TYPE OF SCAN				
Activity	Testing Methods	Results - % of Objective	Variables Controlled	Hours	Material \$	Subcontractor \$
1 - Design - eligible revision	Process trials: 2000 runs: sample %	TOLERANCE: 0.3 mm (100 %) PRODUCTION RATE: 4 units / minute (115 %) REJECT RATE: 2 % (10 %)		0.00	0.00	0.00*

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## 1309 Chemical formulation – DATA COLLECTION SCENARIOS

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.

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## 1309 Chemical formulation – DATA COLLECTION SCENARIOS

### 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 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.

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1309 - Chemical formulation - DATA COLLECTION WHAT IF SCENARIOS							
Benchmarks: Similar prior in-house technologies: 1 products /				Objectives: (none)			
Uncertainty: 1 - Technological Uncertainty		Key Variables: (none)					
Activity	Testing Methods	Results - % of Objective	Variables Controlled	Hours	Materials \$	Subcontractor \$	Priority Year
1 - Case1 - STEADY STATE	(none)	(none)	(none)	0.00	0.00	0.00*	2013
2 - Case2 - STEADY STATE	(none)	(none)	(none)	0.00	0.00	0.00*	2013

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## 1310 Electronics – SR&ED vs. business portion of the project

- 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.

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## 1310 Electronics – SR&ED vs. business portion of the project

### Example (cntd.)

- 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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1310 - Electronics - defining SR&ED portion of total project							
Benchmarks: Similar prior in-house technologies: 1 products / Queries to experts: 1 responses				Objectives: Component size: 25 on 2			
Uncertainty: 1 - miniaturization		Key Variables: (none)					
Activity	Testing Methods	Results - % of Objective	Variables Controlled	Hours	Materials \$	Subcontractor \$	Priority Year
1 - Miniaturization design	Physical prototype: 3 samples ... prototype releases: 25 releases	Component size 25 on 2 (100 %)	(none)	0.00	0.00	0.00*	2013

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## D – Project costs & descriptions

## Summary of Costs by project & Project descriptions Started in 2011: #1101 & 2012: # 1201-1203

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## **D-3's Project #1202: Software - database methodology**

### **I) OBJECTIVE:**

Develop a new data basing method to double the speed of the database

### **DEPARTURES FROM STANDARD PRACTICE**

- Existing DMS works well with small data sets, but has excessive access times (>30 seconds) with large databases (>1 gigabyte).

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## **Project #1202:**

### **II) TECHNOLOGICAL ADVANCEMENTS / UNCERTAINTY:**

#### **Relational Environment Issues**

### **III) SYSTEMATIC INVESTIGATION**

- experimented with existing data communications model
- uncovered new uncertainty with respect to the optimal method to combine relational and packet access methods.

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## **D-4's - Project #1203: Plant breeding example**

### **I) OBJECTIVE:**

- develop new cultivar that embodies genetic traits for higher yield & resistance

### **DEPARTURES FROM STANDARD PRACTICE**

- 10% improved yield
- 10% improved lodging resistance over currently available cultivars
- no sacrifice of resistance to leaf disease(s) or Phytophthora root rot

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## **D-4's - Project #1203 (ctnd.)**

### **II) TECHNOLOGICAL ADVANCEMENTS/UNCERTAINTY:**

- feasibility of combining the desirable genetic traits from different germplasm sources without sacrificing disease resistance

### **III) SYSTEMATIC INVESTIGATION**

- Over 10,000 experimental crosses were made and analyzed in the nursery

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## **E - Eligible costs & tax credits**

Qualified expenditures include Canadian:

- Wages,
- Materials,
- Subcontractors,
- Overheads, and
- Capital equipment

Expenditure pool & tax credits

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## **E - Tax credits**

- Basic federal (20%)
  - Corporations, GP's & individuals
- Enhanced credits (E-5)
  - Phase outs – income & capital
  - refundability
- Provincial incentives (E-14)

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### E - Investment Tax Credit Rates - CCPC

- 35% ITC rate on all qualified expenditures up to the expenditure limit
- 20% ITC rate on all qualified expenditures in excess of the expenditure limit

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### E - Investment Tax Credit Rates

Individuals and Certain Trusts

- ITC rate - 20% on all qualified expenditures
- Refundable - 40% of both current and capital ITC

Corporations (other than a CCPC)

- ITC rate - 20% on all qualified expenditures
- No refund

All Other Taxpayers

- ITC rate - 20% on all qualified expenditures
- No refund

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### E - Refund Rates For Investment Tax Credits - CCPC

1. Qualifying Corporation (other than an Excluded Corporation)

**On Qualified Expenditures up to expenditure limit:**

- 100% of ITCs on current expenditures and proxy amount
- 40% of ITCs on capital expenditures

**On Qualified Expenditures in excess of expenditure limit:**

- 40% of ITCs earned on current and capital expenditures

2. Qualifying Corporation that is an Excluded Corporation

- 40% of all ITCs earned

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### E - Refund Rates For Investment Tax Credits - CCPC

3. CCPC other than a Qualifying Corporation

- Same as #1 except no refund on qualified expenditures in excess of the expenditure limit

4. All other corporations

- No refund

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### E - Expenditure Limit

- Generally \$3,000,000
- Adjusted for short taxation years
- Pro-rated among associated corporations
- Reduced because:
  - a) taxable income of previous taxation year exceeds business limit
  - b) taxable capital (large corporations tax) greater than exemption (generally \$10M)

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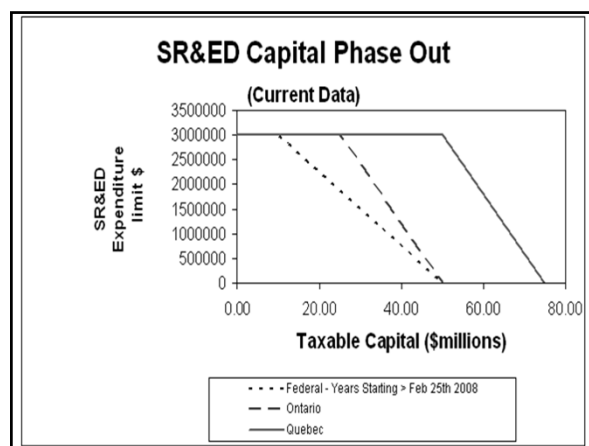
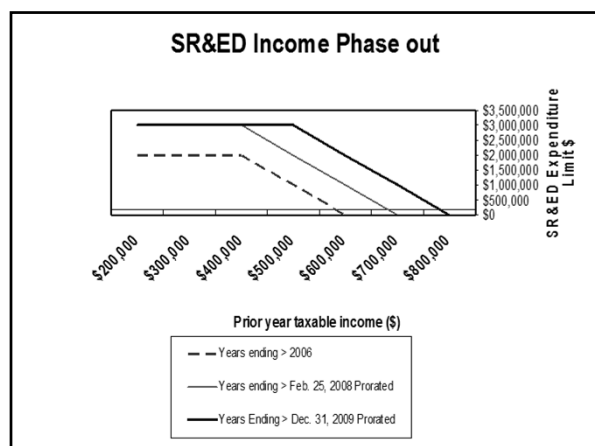
### E - Calculation of the Corporations Expenditure Limit for the Year

For tax years starting > Feb 25, 2008

$$• (\$8 \text{ million} - 10A) \times (\$40 \text{ million} - B) / \$40 \text{ million}$$

- A represents the greater of \$500,000 and the previous year's taxable income
- B is the total of the business limits as determined under subsection 125 for the current year

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Qualified CCPC				
Provinces & Territories	Prov./Terr. Credit	Prov./Terr. Refundable? (Federal is refundable)	Federal Credit Refundable (reduced by Prov./Terr. credit)	Combined
AB	10%	Yes	31.50%	41.50%
BC	10%	Yes	31.50%	41.50%
MB	20%	No	28.00%	48.00%
NB	15%	Yes	29.75%	44.75%
NL	15%	Yes	29.75%	44.75%
NS	15%	Yes	29.75%	44.75%
<b>ON</b>	<b>10%</b>	<b>Yes</b>		
<b>ON</b>	<b>4.5%</b>	<b>No</b>	<b>29.93%</b>	<b>44.43%</b>
PEI	0%	N/A	35.00%	35.00%
QC	20%	Yes	28.00%	48.00%
SK	15%	No	29.75%	44.75%
YK	15%	Yes	29.75%	44.75%
NWT	0%	N/A	35.00%	35.00%
NV	0%	N/A	35.00%	35.00%

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Other companies (non-Qualified CCPC)				
Provinces & Territories	Prov./Terr. Credit	Prov./Terr. Refundable? (Federal is non-refundable)	Federal Credit Non-refundable (reduced by Prov./Terr. credit)	Combined
AB	10%	Yes	18%	28%
BC	10%	No	18%	28%
MB	20%	No	16%	36%
NB	15%	Yes	17%	32%
NL	15%	Yes	17%	32%
NS	15%	Yes	17%	32%
<b>ON</b>	<b>10%*</b>	<b>Yes</b>		
<b>ON</b>	<b>4.5% **</b>	<b>No</b>	<b>17.10%</b>	<b>31.60%</b>
PEI	0%	N/A	20%	20%
QC	10%	Yes	18%	28%
SK	15%	No	17%	32%
YK	15%	Yes	17%	32%
NWT	0%	N/A	20%	20%
NV	0%	N/A	20%	20%

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## E - Claiming Investment Tax Credits

### Annual Investment Tax Credit Limit

- Individuals
  - 100% of Federal tax
- Corporations
  - 100% of Federal tax

### Carry back excess 3 years, and forward:

- 10 years for ITCs earned in taxation years up to the end of 2005
- 20 years for ITCs earned in taxation years that ends after 2005

## E - Qualified Expenditures (for ITC)

### Includes:

- amounts re: shared use equipment;
- SR&ED expenditures under s.37(1)(a) – current;
- SR&ED expenditures under s.37(1)(b)(i) – capital; and
- prescribed proxy amount.

## E - Qualified Expenditures

Do not include:

- prescribed expenditures Reg. 2902 (see N's)
- payments to non-arm's-length person for SR&ED performed on behalf of the taxpayer
- payments to non-taxable suppliers (other than for SR&ED payments for expenditures such as material, capital assets)
- qualified expenditures that have been paid for by government or non-government assistance or compensated by contract payment

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## SR&ED changes in March 29, 2012 Federal budget

Year change proposed to start (prorate)	2012 current	2013	2014 full effect
1) Federal ITC rate (non-CCPC)	20	20	15
2) Subcontractor costs (% eligible)	100	80	80
3) Rate to calculate proxy (overhead)	65	60	55
4) Capital equipment (% eligible)	100	100	0

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## F – SR&ED wages

- T-4 slip?
- Allocation to SR&ED activities (F-3 to 6)?
- Vacation & holiday pay (F-0)?
- >=10% a class of stock (F-7)?
- Technical backgrounds (F-2)?

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### F SR&ED Labour Cost Summary

#	Project	Wages	Specified Employee Wages	Total Wages
1101	Improve compounding equipment	\$ 42,079	\$ 42,510	\$ 104,592
1202	New database method	\$ 65,000	\$ 35,000	\$ 100,000
1203	Chemical - catalyst process improvement	\$ 75,000	\$ 25,000	\$ 100,000
1203	Plant breeding - new cultivar	\$ 41,447	\$ 47,401	\$ 88,848
	ASA adjustment F-7	\$ 5,480	\$ -	\$ -
		<b>\$ 229,006</b>	<b>\$ 149,911</b>	<b>\$ 400,000</b>

**Notes:**  
The CRA requires (requires) documentation from the company's accounting records. Identify the information would provide evidence of regular time accumulations with respect to eligible activities.

#### \* For EACH project

Example: project 1101 allocation	Name of Employee	Wages	Specified Employee Wages	Hourly Wage **	SR&ED Labour Cost
Specified employees:					
	David Newton	Design	180	\$ 48.00	\$ 8,640
	Al Elnen	Engineering	521	\$ 65.00	\$ 33,865
					<b>\$ 42,505</b>
Other employees:					
	Al Nobel	Procurement	880	\$ 36.00	\$ 31,680
	Leo Poter	Materials testing	179	\$ 27.00	\$ 4,840
	Nick Tish	Reception testing	255	\$ 35.60	\$ 9,040
	Procurement	Procurement	125	\$ 135.00	\$ 16,875
					<b>\$ 62,435</b>

\*\* The definition of "salary or wages" (ITA subsection 248(1)) includes vacation and holiday pay. Claimants should ensure that their wage allocations include these amounts.

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Duty	Direct SR&ED	Eligible Overhead expenditures	Non-SR&ED expenditures
Research and analysis	x		
Technical support (e.g. technical assistance, 248(1)(b) of the definition of SR&ED)	x		
(Non-specified employees:)			
• operates a machine for the purposes of an experiment that requires the use of this machine			
• feeds raw materials into a machine			
To be eligible, the non-specified employee's work must be supervised by staff with scientific or technological qualifications			
Direct supervision of employees performing experimentation and analysis (describe the various SR&ED projects)	x		
Technical support for various SR&ED projects you claimed in the year, such as:			
• maintenance of technical/equipment			
• job priorities			
• development of technical/equipment			
• quality of equipment			
• time spent for various SR&ED projects, for example:			
• claims for services in commercial scale			
• product selection			
Manufacturing and other non-technical duties			
SR&ED projects are eligible for overhead (above only)	x		
Technical support for various SR&ED projects you claimed in the year			
Administrative duties			
Technical assistance for general use	x		
Preparation of your accounts			x
Charitable and other administrative support (e.g. in personnel, accounts, maintenance, and maintenance) if the functions performed are non-technical and not the various SR&ED you claimed in the year, and if the salaries and wages of the employees providing the support are			
• directly related and essential to the operation of SR&ED		x	
• not directly related and not essential to the operation of SR&ED			x
Other support (e.g. equipment maintenance or repair) if the functions performed are non-technical and not the various SR&ED you claimed in the year, and the salaries and wages of the employees providing the support are directly related and essential to the operation of SR&ED			
Preparation of Form for SR&ED projects carried out in the current year		x	
Other and non-technical activities			x

Source: Canada Revenue Agency form T4088 (R) Rev. 04 - Claiming Scientific Research and Experimental Development Expenditures Knowledge

### SR&ED Salary & Wage inclusions

	Specified employees <sup>a</sup>	Non-specified employees	ITA section
<b>1 R&amp;D labour for the:</b>			
a) R&D expenditure pool (for deduction), &			37(1)
b) Qualified expense (for ITC calculation)			127(9)
<b>Type of amounts:</b>			
• salary & wages	In	In	(5-8)
• bonuses or profit-based remuneration	Out	In	37(9) & 5(1)
• Expenses paid > 180 days	Out	Out	78(4)
Maximum	\$ x (YMPE)	N/A	37(9.1)
<b>2 Salary basis for proxy amount (for ITC calculation)</b>			
<b>Type of amounts:</b>			
• Income from employment	In	In	5
• bonuses/profit-based remuneration	Out	Out	5(1) & 37(9)
• Expenses paid > 180 days	Out	Out	6 & 7
Maximum	2.5x (YMPE)	N/A	78(4) R.e. 2900(7)

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\* Specified employees own  $\geq 10\%$  any class of stock (or related to such shareholders).

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## F – Reducing taxable income to \$500K

- Consider use of
  - Reasonable bonuses &/or
  - Wages
- Need to get onside each taxation year
- Can't correct once off side
  - Specified future tax consequences
- Ensure with-holdings paid by 7<sup>th</sup> month after year end

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## G – SR&ED Materials

- Were materials consumed during experimentation?
- Materials transformed – if uncertain of use at year-end?
- Repayment on disposition

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### MEUK Corporation G: R&D Materials Consumed in Experimentation

Project	Material	Gross \$	Nature of work	% included in claim	Amount Claimed	Prototype Sold? (Y/N)
1,101	Thermocouples	10,000	prototype samples	100%	\$ 10,000	N
	Fibre additives	5,000	testing flow variables	100%	\$ 5,000	N
	Polypropylene	5,000	prototype samples	100%	\$ 5,000	N
Total					\$ 20,000	D-0
1,202	Alpha test diskettes	5,000	prototype samples	100%	\$ 5,000	N
Total					\$ 5,000	D-0

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## G - Cost of Materials for SR&ED

- Application Policy 2000-01 defines the terms *cost*, *materials*, *consumed*, *transformed*, and provides five examples of SR&ED projects and the related costs.
- The cost of materials consumed or transformed in the prosecution of SR&ED are eligible
- In order to be considered a material, the item must compose the body of a thing at a given moment in the SR&ED process.
- Supplies are not materials and can potentially be claimed as overhead (Regulation 2900(2)(c))
- Recapture may apply where the product of the SR&ED is sold or converted to commercial use (Module 4)

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## G - ITC Recapture - subsequent sale

### Situation

- Property was acquired in the year, or any of the previous
  - 10 taxation years that ended before 2006, or
  - 20 taxation years that ended after 2005, and claimed as Qualified Expenditure.
- After February 23, 1998, that property or property that includes that property is
  - Disposed of, or
  - Converted to commercial use.

### Result

- Recapture of investment tax credit on property acquired - Increase Part I tax
- Reverse the deduction of ITC from SR&ED expenditure pool - Increase eligible expenditures

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## G - ITC Recapture

Qualified Expenditure base for recapture is the lesser of:

- cost or portion of the cost of property and
- the actual or deemed proceeds of disposition of property or property that incorporates the real property if such property is not shared-use equipment and
  - 25% of actual or deemed proceeds of disposition if property is first term shared-use equipment and
  - 50% of actual or deemed proceeds of disposition if property is second term shared-use equipment
- ITC rate applied to recapture is the original ITC rate that applied when Qualified Expenditure was claimed
- Deemed proceeds = FMV of property at the time of a disposition to a non-arm's-length party or a conversion of the property to commercial use

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## H – Third party payment”

- Payments to Universities?
- Entitled to exploit?
- Control of the work?
- Was there a contract?
- T661, Schedule A (T-1.6)?
- Ontario/Quebec university (T-7)?

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### H: Third-Party Payments

Third-party	Gross \$	Nature of work	% included in claim	Claim
University of Toronto	50,000	variable speed drive research NSERC research chair	100%	50,000
Total				<u>\$ 50,000</u> <i>D-0</i>

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## H - Third Party Payments

- (i.1) Third Party Payment to a corporation resident in Canada
  - For SR&ED carried on in Canada
  - Related to the business of the taxpayer
  - Only where taxpayer is entitled to exploit results of SR&ED
- (ii) Third Party Payment to:
  - (A) approved associations
  - (B) approved university, college, research institute or other similar institution
  - (C) non-profit SR&ED corporations
  - (D) reclassified as (i.1) above
  - (E) approved association making payments to (A), (B) or (C)
    - SR&ED carried on in Canada
    - Related to the business of the taxpayer
    - Only where taxpayer is entitled to exploit results of SR&ED
- (iii) Third Party Payment to non-profit SR&ED corporations for basic or applied research

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## I – SR&ED Subcontractors

- Payment to subcontractors for SR&ED activities?
- Work performed in Canada?
- Subcontractor at arm's-length?
- Files a Canadian tax return (HST#)?
- Subcontractor NOT claiming?

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### Meuk Corporation R&D Subcontractor Expenditures

Project	Subcontractor	Gross \$	Nature of work	% included in claim	Claim	Related Company? (Y/N)
1,101	ABC Motor Engineers	35,000	co-design & fabrication of prototype motors	100%	\$ 35,000	N
1,101	XYZ testing labs	10,000	analysis of motor's performance requirements	100%	<u>\$ 10,000</u>	Y
Project #1101 total					\$ 45,000	<i>D-0</i>

There were no subcontractors used on the remaining projects

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## I - Rules for Arm's-Length Contracting

- Payer incurs SR&ED expenditures
- Payee (performer) receives SR&ED contract payment
- Payer claims qualified expenditure for payment made to SR&ED performed on its behalf
- Performer claims qualified expenditure minus contract payment received

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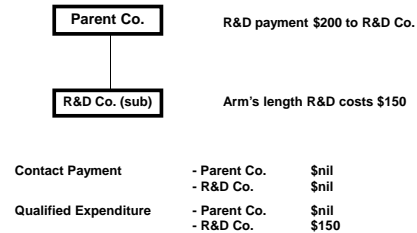


## I - Rules for Arm's-Length Contracting

- Payer does not incur SR&ED expenditures (Qualified expenditures excludes SR&ED payments to non-arm's-length parties for SR&ED done on its behalf)
- Payee (performer) does not receive a SR&ED contract payment
- Performer claims qualified expenditures
- Performer can transfer qualified expenditures to payer

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## I - Non-Arm's-Length Contracting



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## I - Transfer of Qualified Expenditures

Limited to least of three amounts:

- The amount specified in the election
- The transferor's SR&ED qualified expenditure pool at the end of year
- The notional contract payment amount

The SR&ED qualified expenditure pool at the end of the year equals:

- Qualified Expenditures incurred in the year, plus amounts transferred to the taxpayer in the year, less amounts transferred by the taxpayer in the year
- Example per T-4s

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## I - Purchasing Goods or Services from Non-Arm's Length Parties

Goods – capital cost is lesser of:

- Actual expenditure incurred and
- Adjusted selling cost to supplier

Services – expenditure is lesser of:

- Actual expenditure incurred and
- Adjusted service cost to supplier

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## J – SR&ED Capital

- Depreciable property?
- Building, leasehold interest in building, or intangible right?
- Intended use > 50 % SR&ED?
- Intended use > 90 % SR&ED?
- Available for use at year-end?
- Is the property new?
- Is the property purchased before Dec 31, 2013?

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### J: Summary of Capital Expenditures

	Intended SR&ED use		Intended SR&ED use:	Estimated ITC
	>=90%	>=50%		
<b>Assets:</b>				
Testing device	\$ 5,000.00	\$ -	Testing of prototypes	\$ 1,880
Hardware - CAD/CAM	\$ 5,000.00	\$ -	Design of prototypes	\$ 1,880
Computers - R&D employees	\$ 5,000.00	\$ 10,000.00	R&D duties	\$ 1,880
	<u>\$ 15,000.00</u>	<u>D-0 \$ 10,000.00</u>	<u>T-0</u>	<u>\$ 5,640</u>

\* 25 % of this amount will be included as a qualified expenditure for shared use equipment (SUE) in the next two fiscal years (i.e. 2014 & 2015) resulting in \$ 2,300 being disclosed on schedule 32, line number 504 (see T-1.4) of next year's claim.

#### Potential Adjusting journal entry:

DR	SR&ED ITC recoverable	\$ 5,640	} S-0
CR	Equipment (appropriate classes)	\$ 5,640	

To disclose cost of capital assets in financial statements, net of ITC's.

(A solutor's note: Ideally, the claim would include a brief description of each of the SR&ED assets above. This description should briefly outline how each was used during the current year as well as the intended future SR&ED use over its economic life.)

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## J - Capital Expenditures

- Capital expenditures incurred for the provision of premises, facilities or equipment where at the time it was *intended* that ...
- It would be used > 90% of *operating time* in its expected useful life
- Or
- > 90% of value would be *consumed* in the prosecution of SR&ED in Canada
- Excludes
  - Land or a leasehold interest therein
  - Building or a leasehold interest therein (other than prescribed buildings)
  - The cost of acquiring rights to SR&ED
  - Proxy excludes GPOEF
- Includes pool only/ no ITC's
- Available for use

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## J - Shared-Use-Equipment

- New equipment which is used > 50% (primarily) for the prosecution of SR&ED
- ITC is earned in 2 taxation years
- Definitions
  - first term shared-use-equipment
  - second term shared-use-equipment

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## J - Shared-Use-Equipment

### Does Not Include

- "Prescribed depreciable property"
  - Building
  - Leasehold interest
  - Property, or part of a property *intended* to be used in SR&ED during the assembly, construction or commissioning of a facility, plant or line for commercial manufacturing, commercial processing or other commercial purposes, and *intended* for
    - primary use not SR&ED, or
    - value consumed primarily *not* in SR&ED
- General Purpose Office Equipment and Furniture (GPOEF)

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## J - Shared-Use-Equipment

### Computing ITC on SUE

- 1/4 of cost added to Qualified Expenditures at the end of each term
- Must qualify in the first term to be eligible for second term
- The ITC rates are usual SR&ED rates (20% or 35%)
- Normal CCA rules apply

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## K – SR&ED Assistance

- Assistance “receivable”
- All levels of government
- Contract payments received
- No double dip

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## K - Expenditure Pool Adjusted for Assistance

- Deductible SR&ED Expenditures reduced by
  - Government assistance
  - Non-government assistance
- Contract payments DO NOT reduce the expenditure pool – just qualified expenditures (for ITC)

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## K – Effects on ITC's

Qualified Expenditures reduced by:

- Government Assistance
- Non-Government Assistance
- Canadian sourced payments for SR&ED performed on behalf of a customer (Contract Payments)

Qualified Expenditures not reduced by:

- Foreign sourced payments for SR&ED performed on behalf of a customer

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## Ensuring ability to claim contractor costs (no double dips)

To ensure that your company maintains its right to claim credits and work performed, we recommend the following wording be added to the contracts:

- a) you have performed on your behalf &/or
- b) which you perform for others:

**“In the event of any of the development activities performed are eligible for Canadian SR&ED tax credits, X Co. reserves the right to claim these credits.”**

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## L – Unpaid amounts

### ➤ 180 day rule

### ➤ Strategies:

#### ➤ Unpaid salary & wages (R-1)

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## L - Unpaid And Prepaid Expenditures

Unpaid amounts = expenditures incurred in a year that have not been paid 180 days after year-end

For the purposes of calculating SR&ED Expenditures:

- Unpaid salaries, wages and other remuneration must be reported in year incurred
- Unpaid salaries, wages, and other remuneration are deductible in the year paid
- Prepaid amounts considered incurred in the year
  - Third Party Payments covered by 37(1)(ii) and (iii)
  - Unless non-arm's-length
- Prepaid amounts not considered incurred in the year
  - In-house expenditures and contract SR&ED payments
  - Subcontractor to be resident in Canada 37(1)(i.1)

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## M – Foreign expenses

### ➤ In Canada – physically

- Exemption for up to 10% of SR&ED wages

### ➤ Taxable supplier

- Permanent establishment

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## M - Foreign Expenditures

- Not added to the SR&ED pool
- Deductible under 37(2) in the year for current SR&ED expenditures only
- No ITC

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## N – Overheads & prescribed expenses

- Traditional overhead
  - Use reasonable allocation (N-1)
  - Affects eligibility of wages includes some administration & support work (F-5/6)
- Proxy election
  - 65% of SR&ED wages (T-1.5)

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## **N - Eligible SR&ED Current Expenditures Under The Traditional Method**

- Salaries and wages of employees who directly undertake, supervise or support SR&ED
- Materials consumed or transformed in the prosecution of SR&ED
- Payments to contractors for SR&ED performed on behalf of the taxpayer
- Cost of leasing/renting SR&ED equipment used ASA for SR&ED
- Overheads (directly related and incremental)

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## **N - Eligible Current SR&ED Expenditures Under The Proxy Method**

- Salaries and wages of employees directly engaged in SR&ED
- Materials consumed or transformed in the prosecution of SR&ED
- Payments to contractors for SR&ED performed on behalf of the taxpayer
- Cost of leasing SR&ED equipment (not general purpose office equipment and furniture GPOEF) used all or substantially all (at least 90%) for SR&ED
- 50% of cost of leasing equipment (not GPOEF) used at least 50% for SR&ED

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## **N - Prescribed Proxy Amount (PPA)**

- Proxy election is optional
- Proxy election is annual
- Subsection 37(10)
  - election must be filed with first filing of the T661, before deadline
  - cannot amend later
- Notional amount for overheads
- For calculation of ITC only
- Not treated as a SR&ED expenditure
- Actual overheads deducted as business expense

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## **N - Prescribed Proxy Amount**

- 65% of salary base: salaries and wages of employees directly engaged in SR&ED

Reduced to

- 60% for 2013 &
- 55% for 2014+

Salary base:

- excludes taxable benefits under s.6 or s.7
- excludes bonuses or remuneration based on profits
- excludes deemed payments under s.78(4)

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## **N - Specified Employee**

- In calculating the proxy amount, the salary of a Specified Employee is limited to the least of:

- SR&ED portion of salary and wages
- 2.5 times yearly maximum pensionable earnings
- and
- 75% of total salary and wages

- Cap applies to the sum of salaries and wages received from an associated group of companies

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## N - Example re Specified Employee

Salary* of specified employee	\$ 120,000
Non-taxable benefits re salary	\$ 8,000
Cost of materials and sub-contracts	\$ 75,000
Incremental overhead	\$ 50,000
Qualifying CCPC - ITC rate 35%	

\*Salary includes taxable benefits of \$2,000

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## N - Example - Specified Employee

### Calculation of Qualified Expenditures

	Traditional Method	Proxy Method
Salaries	\$ 120,000	\$ 120,000
Benefits	8,000	0
Materials and sub-contracts	75,000	75,000
Overhead	50,000	0
Proxy amount	0	**53,100
Qualified Expenditures	\$ 253,000	\$ 248,100
ITC @ 35%	\$ 88,550	\$ 86,835

\*\* 60% of the least of:

- (a)  $\$120,000 - 2,000 = \$118,000 \times 75\% = \$88,500$   
 (b)  $\$51,100 \times 2.5 = \$127,750$

Salary base = \$88,500; PPA at 60% = \$53,100

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Expenditure	Traditional method	Proxy method
Direct SR&ED salaries or wages	• eligible for ITC • deductible 37(1)(a) (see line 300)	• eligible for ITC and base for proxy amount (see line 502) • deductible 37(1)(a) (see line 300)
• Overhead expenditures directly related to SR&ED	• eligible for ITC • deductible 37(1)(a)	• not a specifically identified • covered in prescribed proxy amount (see examples below)—PPA is eligible for ITC • deductible as regular business expenses only—not deductible under 37(1)(a)
Other expenditures claimed separately: • materials consumed or transformed in performing SR&ED • lease costs of SR&ED equipment • expenditures for SR&ED directly undertaken on your behalf • third-party payments	• eligible for ITC • deductible 37(1)(a)	• eligible for ITC • deductible 37(1)(a)

The proxy amount covers overhead expenditures such as:  
 • office supplies  
 • general purpose office equipment  
 • heat, water, electricity, and telephones  
 • support staff salaries or wages  
 • travel and training  
 • property taxes  
 • maintenance and upkeep of SR&ED premises, facilities or equipment  
 • any other eligible expenditures directly related to the production of SR&ED that you would not have incurred if the SR&ED had not occurred

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### Amounts NOT included in the proxy or traditional overhead amount

#### Costs "prescribed" (ineligible) by Regulation 2902

- Legal and audit
- Interest and bank charges
- Meals and entertainment
- Management bonus
- Amortization
- Administrative Salary
- Interest and share transfer fees
- Advertising or selling expense
- Conference or convention fees
- Due or fee for membership in a scientific or technical society or organization
- Fine or penalty charge

#### Costs ineligible per section 37:

- Materials in cost of goods sold (section 37(1))
- Rent (section 37(8))

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## N - CAP on Prescribed Proxy Amount

Regulation 2900(6) limits PPA to

- Amount of total business expenses
- Less specified adjustments

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## O – CRA review timing

### ➤ CRA services:

- First time claimant
- PCPR & Account Executive

### ➤ Assessment times

- Refundable & filed wT2 – 120 days
- Refundable TPR – 240 days
- Non-refundable – 365 days

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## P – Pitfalls

- Partnerships (P-1)
  - No enhanced ITCs
  - No carryforward of pool
  - No allocation to limited partners

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## Q – Associated Corporations

- Share expenditure limits
  - Aggregate incomes
  - Phase outs (E-2)
- Defacto control
  - Documentation critical (Q-1)
  - Mimetex – case example

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## Q -Tax effects of Corporate Structure

Corporate status:	1) Associated	2) Related	3) Connected
<b>Criteria</b>	Under "common control"	Controlled by related person(s) [RP's]	>10% of FMV of issued & voting shares
<i>ITA references</i>	256(1)	251(2)	186(4)
<b>General tax implications</b>	Share business limits for income & capital tax + Interco. rent = active income	Disclose RP transactions & use "fair market value"	Tax free intercompany dividends
<i>ITA references</i>	125(3-5) & 129(6)	69(1)	186(1)
<b>SR&amp;ED implications</b>	Share expenditure limits for enhanced credits		Employees controlling >= 10% are "specified employees"
<i>ITA references</i>	Election to claim or transfer eligible costs - no mark-ups 127(10.2-4)	127(9) & (13-22)	248(1)

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## R – Advanced planning

- Accrue reasonable wages (R-1)
  - With-holding taxes only payable when amounts actually paid

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## R- Unpaid Amounts

- Subsection 127(26)
- Amounts unpaid 180 days after year-end
- Expenditure deemed not to have been incurred in the year
  - Expenditure is deemed to be incurred when paid
- Investment tax credit earned when expenditure deemed incurred

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## ADDITION TO EMPLOYMENT AGREEMENT [draft – for discussion purposes only]

- **Rate of remuneration:** Subject to statutory deductions, upon submission of weekly timesheets, the Employer shall pay the Employee a gross cash salary, inclusive of any statutory vacation pay to which the Employee may be entitled, equivalent to \$240,000 per year (\$20,000 per month).
- **Timing of payment:** The Employer shall pay minimum balances of \$10,000 (gross before deductions) per month but may reserve payment of amounts in excess of this balance in the event that these funds are required for working capital. The maximum deferral of any such payment will be 180 days of the corporation's year end.

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## S – Financial statements

- Adjusting JE's (S-2)
  - Note disclosure of ITCs & expenses
- Research vs. Development expenses

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### Company Name General Ledger Adjusting Journal Entries

AJE #	WPR of				
1	T-0	DR	Investment Tax Credit receivable	current CRA	221,803
		DR	Investment Tax Credit receivable	current Ontario	84,900
		DR	Investment Tax Credit receivable	non-current CRA	1,004
		DR	Investment Tax Credit receivable	non-current CRA	30,740
		CR	Capital assets (computer hardware)		5,640
		CR	Tax Provision		334,326
					340,466

To recognize research and development related ITC's

CICA Handbook section 3450 recommends that a note to the financial statements indicate the amount recognized for S R&ED investment tax credits in the current year and reduce the related research (current) or development (capital) expenses.

#### Potential note disclosure: Note X – Research & Development

Research and development costs incurred during the year and charged to expense amounted to \$ 743,001 (prior year \$XXX,XXX) and have been reduced by related investment tax credits of \$ 334,826 (prior year \$XXX,XXX). The cost accumulations follow the definition of scientific research and experimental development as provided in the Income Tax Act. No development costs were deferred in the current year.

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## T - Tax summary & forms

- Federal schedules:
  - T661/Sch 32 – expenses (T-1's)
  - Sch 31 & 49 – Expenditure limits & ITCs (T-2's)
  - Sch 1 – taxable income (T-3)
  - T1146 & 1174 – NAL expenses (T-4's)
- Ontario schedules (T-5 to 7)
  - Sch 566 (OITC)/Sch 508 (ORDTC)/OBRI

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### Tax Credit Overview

I Eligible Expenses for deduction		Expense type		Total	Notes T-0.1
		Current	Capital		
Labour		400,000			
Materials	D-0	25,000			
Subcontractors - Am's length		35,000			only 80% eligible to claim
- No-am's length		10,000			
Traditional Overhead		-			
Third-party Payments		50,000			
ASA R&D Capital	D-0	520,000	15,000		I-A
Eligible (deductible) R&D Expenses				535,000	I-B
II Qualified Expenses for calculation of ITC's					
Add					
Proxy (overhead allocation) if elected	T-1.8	240,001	-		calculated at 80% for 2013
Qualified expenditures transferred (T1146)	T-4.1	10,000			
Shared Use Equipment Allocation (SUE)		-			
Less					
non-arm's length contracts		(10,000)			
Subcontractor expenditures Cap		(7,000)	20% of arm's length contractor		
Third party payments expenditures Cap		(10,000)	20% of third party payments		
Used equipment & other prescribed expenses		-			
Qualified Expenditures for SR&ED ITC		743,001	15,000	758,001	II-A

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Credits:		Current	Capital	Total	Is refundable
III Ontario Innovation Tax Credit (OITC)					
Current Expenditures (10%)		743,000	-		100% IS-A
Capital expenses - ASA SR&ED (4%)		-	600		100% IS-A
Total Ontario Innovation Tax Credit (OITC)				743,000	
Ontario R&D Tax Credit (ORDTC) (4.5%)		30,740		30,740	0% → to T-1.3
Ontario Business Research Institute Credit (OBRI)					
Ontario University Payments (2.0%)		10,000		10,000	100%
Qualified Expenditures for Federal SR&ED ITC	T-7	627,862	14,400	642,262	IS-A
IV Federal Investment Tax Credit Earned (35%)					
Current Expenditures (35%)	T-2.2	219,787	-		100% IS-B
Capital expenses - ASA SR&ED (35%)		-	5,640		40% IS-B
Total Federal Investment Tax Credit		219,787	5,640	225,427	
Expected Investment Tax Credit refunds		CRA 219,787	2,016	221,803	
		Ont. 84,300	600	84,900	
Investment Tax Credit carryforward		CRA 30,740	3,024	33,764	
Total Investment Tax Credits earned	T-2.2			340,466	

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### V After tax cost of I.T.C

ITC's earned = eventual taxable income	340,466
Tax Effect - Federal taxes @ 13.1%	(44,601)
Provincial taxes @ 5.5%	(18,726)
Net Taxes Saved	277,139

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### T - Form T661 - Prescribed Form for SR&ED Expenditures

- Part 1: General Information
  - includes choice of proxy or traditional method
- Part 2 - Scientific or Technological Project Information
  - Step 1: Detailed Project Description
  - Step 2: Project Summary Information
- Part 3: Summary of SR&ED Expenditures
  - Step 1: Allowable SR&ED expenditures for SR&ED carried out in Canada
  - Step 2: Pool of deductible SR&ED expenditures
  - Step 3: Qualified SR&ED expenditures for ITC purposes
- Part 4: Background information (includes statistical information)

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### T - Form T661 - Prescribed Form for SR&ED Expenditures

- Schedule A: Third Party Payments
- Schedule B: Special Situations
  - Adjustments to SR&ED expenditure pool
  - Adjustments to Qualified Expenditures
- Schedule C: Non-Arm's-Length Transactions
- Schedule D: Calculation of the Salary Base and the Prescribed Proxy Amount
- Schedule E: List of all SR&ED projects claimed
- Schedule F: Expenditures for SR&ED contracts

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### U – Filing procedures

- File
- E-file or
- Mail to Tax Centre (U-1)
  - Projects to CRA only
    - Now: all information (including project descriptions) within "prescribed form"

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### U - CRA SR&ED Review

- Technical Review
  - desk review
  - may be followed by field visit
- Financial Review
  - most refundable claims
  - other claims at random

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### U - CRA Procedures for Processing SR&ED Claims

- Taxation Centre - first check of return for T661
  - acknowledgement letter sent to taxpayer
  - completeness check by local taxation centre and preliminary assessment of claim
  - Decision to accept claim as filed or forward to CTSO for further assessment
- District Office or Regional Science Office
  - decision to screen (for audit) or downscreen (assess without audit) by Financial Reviewer and/or Research and Technology Advisor (RTA)
- Downscreened returns
  - general technical science check by Financial Reviewer and/or a RTA
  - assessment issued without audit
  - only applies to current claims (not multiple years) filed before the due date of the tax return
  - only applies to filers already in the system and approved

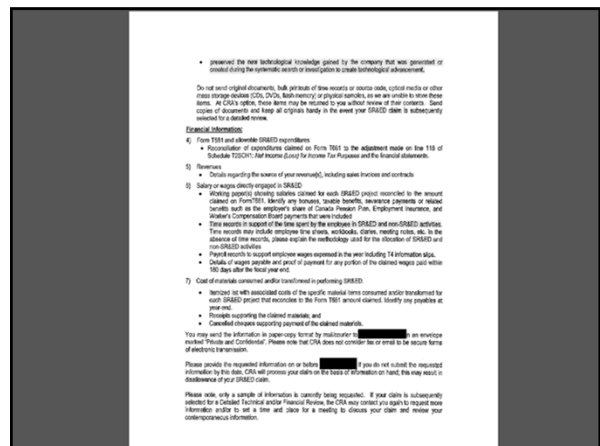
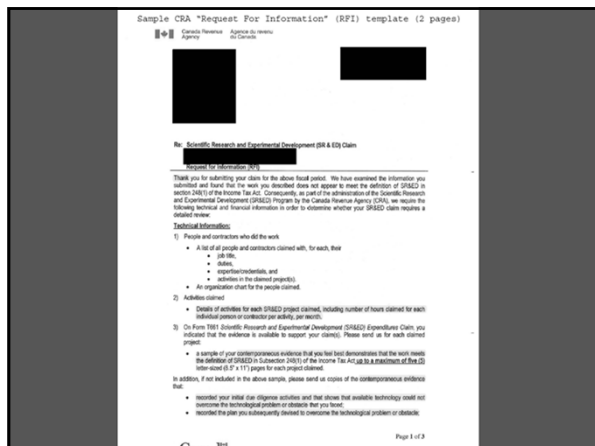
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### U - CRA Procedures for Processing SR&ED Claims

- Screened returns
  - technical review by RTA or technical consultant
  - desk review and possible site visit
  - request for clarification or request for additional information
  - technical report
  - financial review - on site
- Assessment
  - issue proposal letter
  - issue assessment and initiate request for refund
  - should be 120 days from complete claim date to assessment

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## U - Services to Taxpayers

- Pre-Claim Project Review
- Account Executive Service
- National Industry Sector Specialists - RTA for each industry
- SR&ED protocol
- First-time SR&ED claimant service
- Public information and industry specific seminars

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## U.10 Budget 2013 – new reporting on SR&ED preparer fees

According to the Department of Finance,

- “Budget 2013 introduces measures to provide the Canada Revenue Agency with new resources and administrative tools to better respond to the **minority of SR&ED program tax preparers** and SR&ED performers who participate in claims where the risk of non-compliance is perceived to be high and eligibility for the SR&ED program unlikely.”

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## New reporting on SR&ED preparer fees – starts Jan 1, 2014

In particular, in instances where one or more third parties have assisted with the preparation of a claim,

- the Business Number of each third party
- details about the billing arrangements including
- whether contingency fees were used &
- the amount of the fees payable.

In instances where no third party was involved, the claimant will be required to certify that no third party assisted in any aspect of the preparation of the SR&ED program claim.

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## SR&ED – dispute resolution

- The normal “negotiation process” could include:

### Typical dispute resolution steps & timelines

Step	Party(ies)	Expected timeframe
1 Negotiate with CRA reviewer	CRA & client	30 days
2 2nd administrative review	CRA & client	180 days
3 Objection	CRA & client	365 days
4 Appeal (TCC)	CRA, Dept. of Justice & client	2-3 years

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## Legal Timeframes for tax appeals

### Legal Timeframes of Tax Appeal Process:

Step:	Time limits on the Taxpayer	Minister	Notes:
Receive notice of assessment	-	-	
File notice of objection	90 days	-	1) taxpayer can appeal directly to Tax Court of Canada (TCC) if issue not addressed by CRA within 90 days of filing its Notice of Objection.
Receive notice of reassessment	-	-	2) NoRA served to TCC which in turn serves it to: Revenue Canada & Dept. of Justice via a Deputy Attorney.
File notice of Appeal with TCC	-	-	3) If Minister does not file reply the taxpayer can file for default judgement.
File Reply to NoRA w/ TCC	-	60 days	4) This is optional for the taxpayer however, beyond this point the taxpayer can not submit any further documents without the Minister's consent.
Send Reply to NoRA to Taxpayer	-	65 days	5) Both parties have to list the evidence they intend to rely upon & disclose this to each other.
Taxpayer can Answer the Reply	30 days	-	6) The discovery process has no set time limit & can drag on for years.
Exchange - list of documents	30 days	30 days	7) An application for hearing must be filed including the pleadings and admissions of fact. The courts may request a pre-hearing conference.
Discovery	-	-	8) Costs are then allocated to respective parties at the discretion of the courts.
Hearing before the Court	-	-	9) Appeals must be filed within 30 days of the day of judgement from the TCC.
Trial & findings	-	-	
Appeal to Federal Court of Appeal	-	-	

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Typical dispute resolution steps & timelines		
Step	Parties	Expected timeframe
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

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## Notable quote

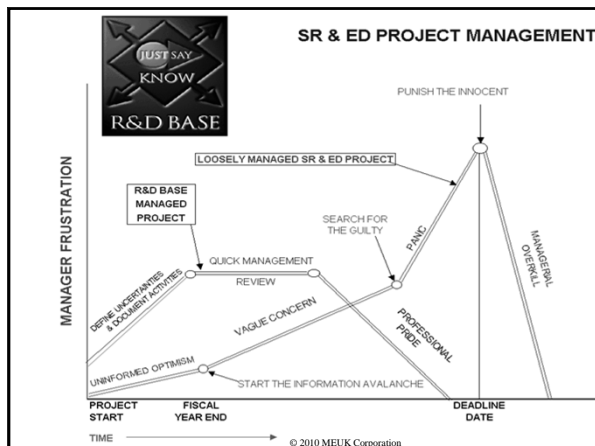
"The best way to predict the future is to invent it."

- Alan Kay

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## X – SR&ED Tax Court Cases

SR&ED cases regarding "technological eligibility"							
JUDICIAL AREA	AFFIDANT	CHALLENGE	WIN, LOSE, DRAW?	ISSUING A RATIONALE	DE LA LOUVE, AMBROSIO & BARRIS (AND REVERENDS)	LONG TERM IMPACT	
1) 40% TECHNICAL ELIGIBILITY (SR&ED)	Northwest Hydroelectric	"systematic" tests for "technological"	Win	2-1 Supreme decision due to "systematic"	systematic tests on technological eligibility	High	
2) 40% TECHNICAL ELIGIBILITY (SR&ED)	Northwest Hydroelectric	definition of "technological"	Win	definition of an hypothesis as an advance	significant precedent definition of "SR&ED"	High	
3) 40% TECHNICAL ELIGIBILITY (SR&ED)	NR Agencies	software development - business vs. technology?	Loss	Failure to hypothesize, lack of novelty, the party defense	Need to focus on technology	Medium	
4) 40% TECHNICAL ELIGIBILITY (SR&ED)	Northwest	software development - business vs. technology?	Draw	2-1 Supreme decision - technology vs. business	Need to focus on technology - esp. Patent 101 vs. Japan & Europe	Medium	
5) 40% TECHNICAL ELIGIBILITY (SR&ED)	Zenith	Is transmitting "radio" signals "technological"?	Loss	As per NW Hydroelectric ruling	Need to clarify "data collection" as "technological"	Medium	
6) 40% TECHNICAL ELIGIBILITY (SR&ED)	Don Macpherson	eligibility of software without "systematic"	Win	SR&ED can be "systematic"	SR&ED can be "systematic"	Medium	
7) 40% TECHNICAL ELIGIBILITY (SR&ED)	NR Agencies	lack of documentation?	Loss	systematic - lack of any representation or analysis	systematic tests - More patent 101/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000	Need to clarify "data collection" as "technological"	Medium
8) 40% TECHNICAL ELIGIBILITY (SR&ED)	NR Agencies	lack of documentation?	Loss	systematic - lack of any representation or analysis	systematic tests - More patent 101/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000	Need to clarify "data collection" as "technological"	Medium
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## Notable quote

“Leaders don't create followers, they create more leaders.”

- Tom Peters

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