Project Name:	Indusol - marine software & SI (LOSS)	**Start Date:**	2021-01-01
Project Number:	2102	**Completion Date:**	2021-07-30

Project Details:

Scientific or Technological Objectives:

Measurement	Current Performance	Objective	Has results?
maximum draft (m)	7	8.15	No
UKC “under-keel clearance” (cm)	50	30	No

This project example is based on the Tax Court of Canada judgment for Indusol Industrial Control Ltd. v. The Queen (2020 TCC 103).

INTRODUCTION

[1] Indusol Industrial Control Ltd. (“Indusol” or the “Appellant”) filed an appeal for its 2012 taxation year.

[2] In so reassessing, the Minister of National Revenue (the “Minister”) ... rejected Indusol’s claim that expenses totalling $111,883 were SR&ED as well as the investment tax credit (“ITC”) of $49,224 claimed in connection with those expenses.

[3] At the hearing, Mr. Robbert Jan van Eijle, the president of Indusol, as well as its sole shareholder and director, represented Indusol and testified on its behalf. Ms. Sandrine Nothomb, a Canada Revenue Agency (“CRA”) financial examiner, as well as Ms. Nadine Bisson, a CRA research and technology advisor, who both reviewed the DIS Project, also testified at the hearing.

[11] The DIS Project objective was described as being to determine whether it is possible for a vessel to transit from Montreal to Lake Erie (via Lake Ontario and the Welland Canal) consistently at a draft of 8.15 m with a minimum UKC of 30 cm.

[114] The overall [technological] objective of the DIS implementation specifications was to develop a standard that specified how the UKC of a vessel could be calculated by considering water level, bottom depth and ship dynamics. Mr. van Eijle confirmed that the purpose of this document was to ensure that any DIS system used on the Seaway would meet certain minimum requirements or would calculate the UKC in a specific manner.

Field of Science/Technology:

Computer sciences (1.02.01)

Project Details:

Intended Results:	Develop new processes
Work locations:	Research Facility
Key Employees:	Robbert Jan van Eijle (shipping management - no technical background noted in case (2000) / President)
Evidence types:	Test protocols, test data, analysis of test results, conclusions; Design, system architecture and source code; Records of trial runs

Scientific or Technological Advancement:

Uncertainty #1: 5 Questions - Technological Uncertainty vs. Systematic Investigation

The judge reviewed the eligibility using the 5 questions cited in the Northwest Hydraulics Case.

1- Was there a technological risk or uncertainty which could not be removed by routine engineering or standard procedures?
2- Did Indusol formulate hypotheses specifically aimed at reducing or eliminating the technological uncertainty?
3- Did the procedure adopted accord with the total discipline of the scientific method, including the formulation, testing and modification of hypotheses?
4- Did the process result in a technological advancement?
5- Was a detailed record of the hypotheses tested, and results kept as the work progressed?

[47] The Appellant identified several uncertainties and challenges which arose either in the 2012 taxation year or throughout

the period from 2010 to 2012. According to the Respondent, these uncertainties and challenges were not technological uncertainties within the meaning of the SR&ED criteria, as many of the stated uncertainties had to do simply with decisions that the DIS Workgroup needed to make with respect to the DIS standards. Also, in some instances, Indusol did no more than identify the problems, which is not an SR&ED activity.

[48] For the reasons stated below, I find that, on a balance of probabilities, only some of the uncertainties raised with respect to the squat issues constitute technological uncertainties within the meaning of the SR&ED criteria. Other uncertainties and challenges identified by the Appellant do not constitute technological risks or uncertainties within the meaning of the SR&ED criteria.

The most significant underlying key variables are:

How to measure velocity of current in real time (unresolved), Squat formula for different sections of channel, Squat for vessels at differing speeds

Technology or Knowledge Base Level:

Benchmarking methods & sources for citings:

Benchmark Method/Source	Measurement	Explanatory notes
Internet searches	10 Articles	test
Similar prior in-house technologies	2 products / processes	The formulas to calculate the squat in various situations were originally developed by the Université Laval in 2002. From 2008 to 2010 Indusol developed the DIS system.

Activity #1-1: Technological Uncertainty (TU) Existed (Fiscal Year 2021)

Methods of experimentation:

Method	Experimentation Performed
Trials:	50 runs / samples

[13] ... in November 2010, a workgroup which included industry players (system manufacturers and shipping enterprises) and representatives of the Seaway Authorities, as well as Mr. van Eijle and Mr. O'Brien of Idon Technologies (the "DIS Workgroup") was formed and met for the first time.

The objective of the DIS Workgroup was to oversee the process for the drafting of the DIS implementation specifications, including the various conformance test procedures. Since the first draft prepared by the Seaway Authorities was clearly unsatisfactory, Mr. van Eijle, through Indusol, volunteered to act as the technical reference for the drafting of these implementation specifications, and Mr. O'Brien was hired to actually write them.

[14] Throughout 2011, various drafts of the DIS implementation specifications were prepared and posted on the Seaway Authorities' websites for public comment, and various meetings of the DIS Workgroup were held. The Seaway Authorities accepted that some testing of the DIS be done by Indusol in the Seaway. After each round of publication, the DIS Workgroup met to resolve any concerns raised, and additional research was done to that end.

[47] The Appellant identified several uncertainties and challenges which arose either in the 2012 taxation year or throughout the period from 2010 to 2012.

According to the Respondent (CRA), these uncertainties and challenges were not technological uncertainties within the meaning of the SR&ED criteria, as many of the stated uncertainties had to do simply with decisions that the DIS Workgroup needed to make with respect to the DIS standards.

Also, in some instances, Indusol did no more than identify the problems, which is not an SR&ED activity.

a) Gathering hydrographical data
b) Hydraulics issues
c) Under Keel Clearance issues
d) Squat issues
e) User interface and display requirement
f) Water level information
g) Communication

(d) Squat issues
[58] According to Mr. van Eijle, issues relating to squat (which is the extra sinkage of a vessel created by the speed of the vessel through the water) were the biggest challenges faced by Indusol in the DIS Project.

[59] The evidence showed that different squat formulas have to be used in various situations, depending on the type of ship, the type of channel, and speed ranges.

Indusol tested the accuracy of squat formulas from different sources and decided to implement the formulas developed by the Université Laval in 2002. Furthermore, the evidence showed that Indusol had to determine how to implement and apply the squat formulas within the DIS.

[60] Even though the squat formulas used by Indusol were already available, I find that, on a balance of probabilities, there were still some technological uncertainties involved in the process for the implementation of the squat formulas within the DIS. These uncertainties with respect to the additional squat that occurs when two vessels meet in a channel could not be resolved by routine engineering or standard practices.

[61] Technological uncertainty within the meaning of the SR&ED criteria may occur in either of two ways: ". . . it may be uncertain whether the goals can be achieved at all; or the taxpayer may be fairly confident that the goals can be achieved, but may be uncertain which of several alternatives (i.e., paths, routes, approaches, equipment configurations, system architectures, circuit techniques, etc.) will either work at all, or be feasible to meet the desired specifications or cost targets, or both of these" (the Circular, at para. 2.10.2).

[62] The Appellant identified three uncertainties with respect to implementing the squat formulas in the DIS:

(1) the speed of a vessel could not be easily measured because there was no solution for measuring the velocity of the current in real time;
(2) the squat formula needed to be altered for different sections of the channel; and
(3) the additional squat that occurs when two vessels approach each other at different speeds has to be accounted for.

[63] According to Mr. van Eijle, the first major uncertainty in the implementation process was to ascertain how to measure the speed of a vessel through the water while taking into consideration the velocity of the current. Furthermore, Mr. van Eijle testified that there was no solution for measuring the velocity of the current in real time.

Indusol proposed using a table in order to determine the velocity of the current. To calculate the actual speed through the water of a vessel navigating downstream, the velocity of the current would be added to the GPS speed of the vessel. To calculate the actual speed of a vessel navigating upstream, the velocity of the current would be deducted from the GPS speed of the vessel.

Indusol was requested to test the proposal on board vessels, and the proposal was ultimately accepted.

[65] According to Mr. van Eijle, the second major uncertainty was how to change the squat formulas according to the channel type during a ship's transit. Indusol proposed dividing the Seaway into multiple sections and assigning a channel type to each section. When a vessel travelled in a certain section, the system would apply the appropriate squat formula for the section depending on the assigned channel type. Indusol was requested to test the proposal and this proposal was also ultimately accepted.

[67] The third major uncertainty was how to take into account the increased squat when two vessels meet in a channel. Since the additional squat was uncertain, Indusol performed tests to measure the additional squat when two ships were traveling at different speeds. This additional squat was then added to the squat calculation.

Results:

[64] Regarding the first uncertainty, I find that, on a balance of probabilities, there was no technological uncertainty within the meaning of the SR&ED criteria, because I am not satisfied that the uncertainty could not be resolved using routine engineering or standard procedures.

Mr. van Eijle testified that he proposed to use a table in order to determine the velocity of the current. No evidence was adduced at the hearing as to the difficulty involved in this method, or as to whether the table was readily available to competent professionals in the industry. Therefore, I find that the Appellant has not shown that this was a technological uncertainty which could not be removed by the application of routine engineering or standard procedures.

[66] As regards the second uncertainty, I find that, on a balance of probabilities, there was no technological uncertainty within the meaning of the SR&ED criteria because I am not satisfied that the uncertainty could not be resolved using routine

COMMERCIAL CO

engineering or standard procedures.

The evidence showed that the various squat formulas developed by the Université Laval in 2002 took into account the different channel types. I find that routine engineering or standard procedure could have been used to resolve that uncertainty.

[68] Concerning the third uncertainty, the evidence showed that the Université Laval's research did not include a method to calculate the additional squat when two vessels approach each other at different speeds.

The Appellant was uncertain as to whether the proposed solutions would be effective in achieving the goals or desired specifications. Therefore, I find that, on a balance of probabilities, the evidence showed that there was technological uncertainty within the meaning of the SR&ED criteria.

[91] According to the Timeline, during a DIS Workgroup meeting held on June 13, 2011, the uncertainties associated with the squat issues were identified. Indusol proposed potential solutions to address these uncertainties. At the hearing, Mr. van Eijle further explained the various proposals.

[92] According to the Respondent, there is no evidence that the Appellant formulated any hypothesis designed to reduce or eliminate the uncertainties or that it conducted a methodical and systematic testing of the hypothesis. The evidence showed that Mr. van Eijle would identify a problem and try to resolve it, but the process involved is unclear.

Conclusion:

[69] For these reasons, I find that, on a balance of probabilities, there was some technological uncertainty within the meaning of the SR&ED criteria as regards the implementation of the squat formulas within the DIS.

This uncertainty was with respect to the additional squat when two vessels meet in a channel. I also find that Indusol carried out the above-described activities during the 2012 taxation year.

[93] On the evidence adduced at trial, I find that, on a balance of probabilities, hypotheses were formulated that were designed to reduce or eliminate the technological uncertainties involved with respect to the squat issues.

However, for the reasons explained below in the section dealing with the third criterion, I am not convinced that Indusol conducted a methodical and systematic testing of the hypotheses.

Accordingly, I find that the second criterion is not met, as it requires the methodical and systematic testing of hypotheses.

Significant variables addressed: Squat for vessels at differing speeds, Squat formula for different sections of channel

Documentation:

- Uploaded to RDBASE.NET: Indusol SRED tax ruling - SI & software - LOSS with Costs.pdf (511KB)
- Offline Documents: docs

Activity #1-2: Lack of Systematic investigation (Fiscal Year 2021)

Methods of experimentation:

[99] ....accorded with the total discipline of the scientific method. The Appellant simply did not adduce sufficient evidence to meet this criterion.

[100] According to the Timeline, the Appellant identified uncertainties with respect to the squat formulas and identified as well the potential solutions and the final accepted solutions.

Even though the Timeline mentions that Indusol was requested to conduct research and testing on board vessels, there is no information on what tests and research were actually carried out.

[101] Mr. van Eijle's testimony about how Indusol tested the proposed solutions and what the results of the tests were was also very vague. For example, with respect to calculating the additional squat when two ships approach each other in a channel, Mr. van Eijle testified that

"since we don't know exactly what it is, we, out of testing, created a table with speed ranges. . . . We went on board and measured and measured and measured. . . ." (Transcript of February 10, 2020, at p.101, lines 10-11, 21-22).

There was no evidence about any controlled experiments to test the proposed solution against empirical evidence.

With respect to calculating the speed of a ship taking into consideration the velocity of the current, Mr. van Eijle explained during the trial the solution ultimately arrived at, but there was no evidence as to whether systematic observation,

measurement, and experiment were performed with a view to modifying the proposed solution which led to the final solution.

[115] ... to comply with the DIS implementation specifications. A series of conformance tests must be performed to demonstrate that the product meets the requirements in the specifications.

Exhibit A-12 documents the conformance testing procedures established for that purpose. This document does not record the hypotheses tested by Indusol and the test results.

It is merely a set of testing procedures that must be followed in order to determine whether a DIS conforms with the established standards.

[116] The Appellant also provided several charts which purportedly document work done by Indusol:

Exhibit A-6: Comments by Indusol Industrial Control Ltd. on Draft Working Document Version 1.00 (dated January 30, 2011)
Exhibit A-8: Comments on CD 1 of a Draught Information System for the St. Lawrence Seaway (dated January 18, 2011)
Exhibit A-9: Comments on CD 1 of a Draught Information System for the St. Lawrence Seaway (dated January 18, 2011, updated August 21, 2011)
Exhibit A-10: Resolution of Comments on CD 2 of a Draught Information System for the St. Lawrence Seaway (dated August 24, 2011)

[117] After reviewing those charts, I am not satisfied that they contain hypotheses tested and test results. The charts are records of Indusol's comments on specific provisions of the draft DIS implementation specifications and the DIS conformance tests.

In some instances, the proposed changes to the provisions and the final decisions of the DIS Workgroup are included, but I do not find that any of the documents include hypotheses tested and test results.

Results:

Conclusion:

[102] For these reasons, I am not convinced that the procedure adopted by Indusol accorded with the total discipline of the scientific method. The Appellant simply did not adduce sufficient evidence to meet this criterion.

Therefore, for these reasons, I find that, on a balance of probabilities, the third criterion is not met.

[AUTHOR'S NOTE: COSTS ON THIS CASE AMOUNTED TO $ _____ - CHECK WITH TAX COURT OF CANADA]

Uncertainty #2: Financial issues

The most significant underlying key variables are:

documentation of time vs. activities, is software eligible SR&ED material

Technology or Knowledge Base Level:

Activity #2-1: Tracking labour expenses (Fiscal Year 2021)

Methods of experimentation:

[135] In February 2013, the CRA requested details regarding the breakdown of the efforts devoted by the employees to the activities engaged in by Indusol during that year, and acknowledged the absence of timesheets to that point. The evidence showed that no such details were submitted to the CRA.

The Appellant could have used agendas, records, e-mail exchanges, notes and correspondence to reconstruct that information, as the CRA's request was made less than a year after the end of the 2012 taxation year.

Results:

Conclusion:

[137] Here, Mr. van Eijle simply estimated the number of hours he and Ms. Clément worked during the 2012 taxation year and claimed that 75% and 50% of their respective time was devoted to SR&ED activities.

Since the Appellant's estimates are extremely general and were submitted without any evidentiary support, the salaries paid to Mr. van Eijle and Ms. Clément cannot be allowed as deductible eligible SR&ED expenditures and cannot be considered qualified expenditures for ITC purposes.

I find that the lack of evidence as to the time spent on various tasks is fatal to Indusol's claim.

Significant variables addressed: documentation of time vs. activities

Activity #2-2: Software as material cost? (NO) (Fiscal Year 2021)

Methods of experimentation:

[147] The Act does not define the words "materials" or "consumed". The principles of interpretation as set out by the Supreme Court of Canada are that the words of an Act ". . . 'are to be read in their entire context and in their grammatical and ordinary sense harmoniously with the scheme of the Act, the object of the Act, and the intention of Parliament' . . . The interpretation of a statutory provision must be made according to a textual, contextual and purposive analysis to find a meaning that is harmonious with the Act as a whole" (Canada Trustco Mortgage Co. v. Canada, 2005 SCC 54, at paragraph 10, [2005] 2 S.C.R. 601). The Supreme Court also indicates that when the words are precise and unequivocal, their ordinary meaning will play a dominant role, but if the words can support more than one reasonable meaning, the ordinary meaning of the words will play a lesser role.

[150] In Black's Law Dictionary (11th ed.), material is defined as "1. A solid substance such as wood, plastic, metal, or paper. 2. The things that are used for making or doing something. 3. Information, ideas, data, documents, or other things that are used in reports, books, films, studies, etc."

Results:

Conclusion:

[151] Given the ordinary meaning of the word material, which generally refers to elements from which something is made, I find that the Licence cannot be considered as a "material".

The Licence was used by Indusol to help with software development and hence is not an element from which something is made.

Given my conclusion in respect of the word material, I do not have to consider the meaning of the word "consumed". Therefore, the cost of the Licence cannot be claimed by Indusol under paragraph 37(1)(a) as a current expense as a cost of materials consumed in the prosecution of SR&ED.

Significant variables addressed: is software eligible SR&ED material