Project Name:	CRL Engineering - distributed computing (WIN)	**Start Date:**	2020-02-10
Project Number:	2003	**Completion Date:**	2020-08-31

Project Details:

Scientific or Technological Objectives:

Measurement	Current Performance	Objective	Has results?
Accuracy of data (%)	(not set)	(not set)	No
Autonomous system (1=yes / 0= no)	0	1	No
General purpose equipment (1=yes / 0=no)	0	1	No
Distributed data (1=yes / 0=no)	0	1	No

This project is based on the Tax Court of Canada judgment for CRL Engineering Ltd. v. The Queen (2019 TCC 65).

[13] The Appellant is an engineering firm specialized in developing public transit related technology. It was incorporated in September 2009.

[14] Dr. Raman Paranjape, the Appellant's Chief Executive Officer, testified at the hearing. He holds a Ph.D. in engineering and is a professor of Electric Systems Engineering at the University of Regina. The Appellant's Chief Operating Officer, Craig M. Gelowitz, also holds a Ph.D. in engineering. He was present throughout the hearing but did not testify.

[15] The Appellant commenced its SRED activities as early as 2010 and it was ongoing during the subject taxation years. The Appellant described it as "A Real Time Vehicle Arrival Prediction Model for Transitlive" (the "Project"). It was intended to develop the Appellant's web based system using algorithms and a global positioning system ("GPS") data to provide accurate real time for public transit buses.

Field of Science/Technology:

Computer sciences (1.02.01)

Project Details:

Intended Results:	Improve existing processes
Work locations:	Research Facility
Key Employees:	Dr. Raman Paranjape (Electrical Engineering - PhD (1985) / CEO)
Evidence types:	Records of resources allocated to the project, time sheets; Samples, prototypes, scrap or other artefacts; Design, system architecture and source code

Scientific or Technological Advancement:

Uncertainty #1: Technological uncertainty

[16] The Appellant argued that the Project involved "developing a physically distributed, multi-computing platform using general purpose computing systems to create, communicate, integrate, analyse and report real-time, dynamic data to users of the transit systems and administrators" and that the technological uncertainty was whether "autonomous computational systems based on general-purpose computing units could be effectively deployed in order to provide accurate and real-time status information to both users and administrators in real-world transit systems". It was argued that the use of "general purpose computing systems" for that purpose is what "creates real scientific uncertainty."

[17] The Respondent (CRA) argues that there was no scientific uncertainty and that the Project involved the use of existing technology, notably Global Positioning Systems or "GPS", and routine engineering or, as described in paragraph (f) of the definition "routine testing of materials, devices, products or processes".

[21] The Appellant described what it called its "over-arching hypothesis" as whether "autonomous distributed computing systems based on general purposes computing units [can] be effectively deployed in order to provide accurate real-time status information to both users and administrators in a real world transit system". The Respondent argues that the Project involved a series of unrelated and un-connected tasks and that there was no real hypothesis.

[22] While the hypothesis appears to be phrased more as a question than an assumption, I find that the Appellant had a "logical plan devised to observe and resolve the hypothetical problem" and that, as such, this criterion is satisfied.

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The most significant underlying key variables are:

characteristics physically distributed GP equip (unresolved), use of autonomous system (unresolved)

Technology or Knowledge Base Level:

Activity #1-1: Development (Fiscal Year 2020)

Methods of experimentation:

Method	**Experimentation Performed**
Trials:	10 runs / samples
Other methods:	67000 lines of code

[23] The Appellant indicates that it installed and monitored “a set of computing units on transit vehicles (…) to examine how the system could function” and included various iterations of a code to test some aspect of the operating system that was “regularly updated to evaluate sequentially and progressively more complex options (...) and to examine alternatives”. The Appellant argues that the activities constituted a “progressive and systematic investigation” including adjustments to the sub hypothesis, followed by new testing and documentation.

Results:

Were detailed records kept as the work progressed? THE JUDGE COMMENTED:

[30] The Appellant’s witness explained that “system snapshots were captured on a weekly basis and maintained in a document repository” that were accessible and regularly reviewed. It also maintained a “wiki” that was used to “log data, methods, issues and results”. The documentary evidence, notably Exhibits A 1 and A 3, supported Dr. Paranjape’s oral testimony on this issue.

[31] On balance, I find that the Appellant has satisfied this criterion.

Conclusion:

[26] The Appellant argued that its activities were “focused on understanding the nature and characteristics of physically distributed general purpose multi-computing systems in a hostile and challenging environment”. Its results were reported in a scholarly journal (Exhibit A-2) though the Appellant conceded that its research activities were ongoing. It argued that its research provided a “launching pad for new achievements in distributed computing”.

AS A RESULT THE JUDGE RULED:

[32] On the basis of the documentary and testimonial evidence adduced at the hearing, the Court finds that the Appellant has satisfied the five-factor test described in the case law and that it was engaged in SRED activities during the subject taxation years.

Documentation:

- Offline Documents: weekly system snapshots