Project Name:	ACBK Thermal Storage LOSS	**Start Date:**	2023-03-01
Project Number:	2303	**Completion Date:**	2023-10-31

Project Details:

Scientific or Technological Objectives:

Measurement	Current Performance	Objective	Has results?
Efficiency (%)	80	90	No

This project description is based on the Tax Court of Canada judgment of ACBK Management Inc. vs. The king Date : 2022-09-29, Neutral reference : 2022 CCI 94, File number : 2015-3974(IT)G

8] André Roy (“Mr. Roy”) was the president and sole director of Hydro LMR during the relevant period. He is an electromechanical by training and specializes in automation/. mr. Roy's work consisted mainly of designing, installing and programming automated systems in the food industry.

9] On an unspecified date before the year in question, Dominic Laperle (“Mr. Laperle”) had installed a system called

“hydrodynamic system for the energy-efficient assistance of a building, construction methods and corresponding uses" in a residence in Saint-Césaire, in the province of Quebec. Mr. Laperle obtained a patent for this system.

According to Mr. Roy's testimony, Mr. Laperle's system makes it possible to reduce the effect of a building on the environment by making it self-sufficient in energy.

[10] After the construction of the residence was completed and the hydrodynamic system was installed, Marc Brunet (“Mr. Brunet”), of the Center de recherche industrielle du Québec (“CRIQ”), contacted Mr. Roy to to ask him if he could improve Mr. Laperle's system. To this end, Mr. Brunet asked him to accompany him on a visit to the residence in Saint Césaire.

Following the visit, Mr. Roy became interested in Mr. Laperle's system and decided, through Hydro LMR, to purchase land in Saint Alphonse de Granby, in the province of Quebec, to build a triplex and install an improved version of Mr. Lapierre's system.

[11] To this end, Hydro LMR created a project called "Study and Analysis of a Thermal Storage System"

Field of Science/Technology:

Applied mechanics (2.03.02)

Project Details:

Intended Results:	Improve existing processes
Work locations:	Commercial Facility, Research Facility
Key Employees:	Andre Roy (ACBK) (Unknown - TECHNICAL BACKGROUND NOT DISCLOSED (2000) / Presdient)
Evidence types:	Test protocols, test data, analysis of test results, conclusions; Records of resources allocated to the project, time sheets; Samples, prototypes, scrap or other artefacts; Project planning documents; Photographs and videos; Design of experiments; Records of trial runs

Scientific or Technological Advancement:

Uncertainty #1: Technological uncertainty

[28] According to Mr. Roy, in order to design his “life-size” prototype, he used Mr. Laperle's notes and patent. However, he identified a major design problem in Mr. Laperle's system. According to him, the temperature of the water in the tanks was not adequate; it was way too cold and freezing.

This prevented the pump that was used to transport water to the solar panels installed on the roof of the building from working properly. Still according to Mr. Roy, the causes of the problem were the size of the tanks, the absence of a probe to measure the temperature and the programming of the control panel.

[29] Mr. Roy testified that when designing his system, he faced two technological uncertainties, namely the size of the water tanks and the temperature of the water they contained.

The most significant underlying key variables are:

tank size (unresolved), water temperatures (unresolved), basin orientations (unresolved)

Technology or Knowledge Base Level:

Benchmarking methods & sources for citings:

Benchmark Method/Source	Measurement	Explanatory notes
Patent searches	1 patents	work aims to improve on existing patented process

Activity #1-1: Activity 1 (Fiscal Year 2023)

Methods of experimentation:

Method	Experimentation Performed
Trials:	1 runs / samples
Physical prototypes:	1 samples

[26] In this case, in order to be able to install an improved version of Mr. Laperle's hydrodynamic system on the triplex, Mr. Roy first purchased Mr. Laperle's patent for the system. He also used Mr. Laperle's handwritten notes to design and install this second prototype of the triplex hydrodynamic system.

Before construction of the triplex began, Mr. Roy met with Daniel Rousse (“Mr. Rousse”), researcher holding the Industrial Research Chair in Energy and Efficiency at the École de technologie supérieure (“ÉTS”), to to carry out a numerical simulation of its system. After this meeting, Mr. Roy obtained the ÉTS report with the results of the simulation. Subsequently, Mr. Roy decided to build a “life-size” prototype of his system, which he integrated into the triplex.

[27] The system designed by Mr. Roy included, among other things, solar panels installed on the roof of the building, concrete water tanks filled with gravel buried under the concrete floor of the basement of the building, a heat pump , a radiant floor system, a control panel (computer) and probes to measure the water temperature in the tanks.

[29] Mr. Roy testified that when designing his system, he faced two technological uncertainties, namely the size of the water tanks and the temperature of the water they contained.

In order to solve these problems, with the help of the data contained in the ÉTS report, Mr. Roy changed the size of the pools and installed probes to measure the temperature as well as additional valves. He therefore changed the size of the basins used by Mr. Laperle, in addition to inserting the smaller of the two basins inside the larger one.

In addition, he installed a third basin (a conventional water heater) outside the building and connected it to the system. Finally, he also installed and programmed the control panel which also controls the water pump.

According to Mr. Roy, these uncertainties could not be eliminated using standard procedures or standard techniques.

Results:

CRA arguments:

[31] In addition, according to Mr. Desmarais' testimony, Mr. Roy used known thermodynamic principles to measure energy exchanges in a system. Still according to Mr. Desmarais, it was possible to measure the heat exchanges between the basins and to model the system envisaged by using equations and mathematical concepts known at the time in order to estimate the adequate dimensions of the basins. A scale model could also have been used to test it.

[32] Finally, Mr. Desmarais also indicated that Mr. Laperle's patent referred to other prior patents relating to thermal storage, which enabled him to conclude that there were systems similar to the one designed by Hydro LMR since the 1980s.

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Conclusion:

JUDGES RULING & RATIONALE:

[30] The evidence shows that Mr. Roy used standard techniques to try to resolve the two technological uncertainties he was facing. During his testimony, Mr. Roy did not describe precisely the techniques he used to try to overcome these uncertainties, whether during the design or the construction of his system.

The evidence does not show that the modification of the sizes of the pools, the installation of probes for measuring the temperature, the installation of valves and the design and installation of the control panel required the use of practices which were not not commonly used at the time.

[33] The appellant has not demonstrated that the technological uncertainties faced by Hydro LMR during the design and installation of its hydrodynamic system could not be eliminated by current techniques or by usual procedures.

The Court concludes that Mr. Roy used standard techniques to try to resolve the two uncertainties he faced.

[34] Consequently, the Court concluded that the activities ... do not constitute SR&ED activities within the meaning of the ITA.

AUTHORS NOTE - POTENTIAL STEPS ON HOW TO TURN THIS JUDGEMENT INTO A WIN

- Get expert opinions or testimony - e.g. testimony from Marc Brunet (“Mr. Brunet”), of the Center de recherche industrielle du Québec (“CRIQ”), who had contacted Mr. Roy to to ask him if he could improve Mr. Laperle's system.

- perform more detailed prior art review - for example review of initial patent & correlation of current analysis to issues cited

Documentation:

- Offline Documents: docs

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