Project Name:	JEC Distributors - welding LOSS	**Start Date:**	2023-06-01
Project Number:	2306	**Completion Date:**	2023-11-30

Project Details:

Scientific or Technological Objectives:

Measurement	Current Performance	Objective	Has results?
Sensors (per gun vs per cell) (number)	1	12	No

This project description is based on the Tax Court of Canada judgment of JEC Distributors Inc. v. The King Date 2022-12-28 Neutral citation 2022 TCC 170 File number 2019-1422(IT)I

[1] The Appellant is a manufacturer and distributor of products for the auto industry. It primarily focuses on welding products and technology. The Appellant is what is known as a Tier 2 manufacturer.

[2] When the Appellant filed its tax return for its taxation year ending September 30, 2016, it claimed scientific research and experimental development expenditures of $91,537 in respect of three different projects. The Minister of National Revenue denied that claim and the Appellant has appealed.

Testimony
[3] Three of the Appellant's employees testified: Joe Ruggiero, Paul Lichaa, and Bill Dodge. I found each of them to be credible witnesses. They provided very helpful descriptions of the Appellant's work and the work involved in the projects in question.

[4] I also heard the testimony and cross-examination of Jason Sousa from the Canada Revenue Agency. I found him to be a credible witness but his evidence was of little assistance to me.

[8] There are three projects in issue. Each of them relates to the Appellant's resistance welding products.

We will analyze the first of these projects:

C. Project 1
[9] The first project was called the "Data Link Flow Monitor". The Appellant's witnesses explained that the Appellant's welding guns have two welding tips that close over the metal to be welded like a jaw.

[10] During the welding process, the tips become very hot. Water is run through the guns to help cool the tips. It is important that the water is the appropriate temperature and that it flows at an appropriate rate. If the water becomes too warm or stops flowing properly, the welds will not work properly or the tips will fuse to the metal they are welding and be pulled off the guns. In either case, the Appellant's customers will have to shut down their manufacturing lines which will cost the customers time and money.

[11] The purpose of Project 1 was to develop a system of sensors that could be applied to each welding gun to monitor the flow and temperature of the water to that gun.

[12] A welding cell is an area on a manufacturing line containing one or more welding guns. Existing temperature and flow systems measured the water flowing to the entire welding cell. The Appellant believed that a system that monitored each gun individually would allow its customers to pinpoint which gun in the welding cell was causing a problem and thus reduce the amount of shut down time.

Field of Science/Technology:

Materials engineering & metallurgy (2.05.01)

Project Details:

Intended Results: Develop new processes

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Project Name:	JEC Distributors - welding LOSS	**Start Date:**	2023-06-01
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Work locations:	Commercial Facility, Research Facility		
Key Employees:			
Evidence types:	Records of resources allocated to the project, time sheets; Samples, prototypes, scrap or other artefacts; Contracts		

Scientific or Technological Advancement:

Uncertainty #1: Technological uncertainty

[13] To gather data from each gun, the Appellant also needed to find a way to connect each welding gun's temperature and flow monitors to the customers' manufacturing computer systems, preferably using Ethernet connections. This presented challenges because different customers operated different systems.

[14] Finally, the Appellant believed that, if it could gather enough data from the welding guns, it could develop algorithms that would help to predict when a problem was going to arise. This would allow the Appellant's customers to anticipate problems and possibly fix them before they happened.

The most significant underlying key variables are:

electrical noise mitigation (unresolved), communication protocols (unresolved)

Technology or Knowledge Base Level:

Benchmarking methods & sources for citings:

Benchmark Method/Source	Measurement	Explanatory notes
Suppliers	1 products	approached supplier of flow monitoring methods

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

Methods of experimentation:

[15] The witnesses explained that the Appellant tested a number of different sensors to monitor flow and temperature. It kept changing the technologies until it found something that it thought would work not only in the lab but also on the manufacturing line.

[16] After encountering problems with standard flow monitoring technology, the Appellant asked a company with expertise in flow monitoring to develop a custom solution for them. However, it had problems connecting those monitors to the customer's systems because it could not get access to the relevant proprietary software.

Results:

[17] Ultimately, the biggest problem for the Appellant was that there was a lot of electrical noise on the manufacturing line and it interfered with the sensors. This electrical noise is well known to be an issue with resistance welding.

[18] The Appellant also found that the sensors could not withstand the dirt and contamination present in a welding cell.

Finally, there were challenges with communication protocols. The Appellant had problems finding a way of sending so many different signals to and from the welding cell at the same time without slowing down the other communications that need to happen on the line.

[19] To date the Appellant has been unable to overcome any of the above problems

Conclusion:

22] However, it is not enough for the Appellant to prove that it could not remove the risks and uncertainties through routine engineering or standard procedures. The test is an objective test, not a subjective test. The Appellant must show that the risks could not be overcome by routine engineering or standard procedures generally accessible to competent professionals in the field. The Appellant did not do so.

[23] The Appellant's expertise is in welding technology. I have no way of knowing, for example, whether an electrical engineer or even a skilled electrician could have proposed a routine solution to prevent the electric noise from reaching the sensors. Similarly, I have no way of knowing whether a computer engineer or a technician with networking expertise could have employed standard networking procedures to connect the sensors to the Appellant's customers' networks.

[24] Based on all of the foregoing, I find that Project 1 does not meet the first test.

[25] I note that, as the Appellant never proceeded to the stage of attempting to develop algorithms, I have not considered whether that part of Project 1 would have met the first test.

Documentation:

- Offline Documents: docs