Docket: 2019-964(IT)G

BETWEEN:

WILLOWGLEN SYSTEMS INC.,

Appellant,

and

HIS MAJESTY THE KING,

Respondent.

Appeal heard on December 4, 5, 6 and 7, 2023, at Edmonton, Alberta and continued virtually on May 28 and 29, 2024

Before: The Honourable Justice Susan Wong

Appearances:

Counsel for the Appellant:	Robert A. Neilson Trent Blanchette
Counsel for the Respondent:	Valerie Meier Courtney Davidson

JUDGMENT

The appeal is allowed on the basis that:

(a) the appellant's activities with respect to the MTCLM (Manual Train Control Logic Module) project constituted SR&ED in its taxation year ending July 31, 2014;

(b) the appellant incurred qualified SR&ED expenditures with respect to the MTCLM project in the amount of $495,136 for that year;

(c) the appellant's activities with respect to the SCADACOM-5 (Supervisory Control and Data Acquisition) project did not constitute SR&ED in its taxation

year ending July 31, 2014 and no amount of the disallowed $1,293,692 are qualified expenditures.

(d) In light of the respondent's substantial success, costs are awarded to the respondent.

(e) The parties shall have until April 9, 2026 to reach an agreement as to costs, failing which the respondent shall file written submissions by May 11, 2026 and the appellant shall file a written response by June 11, 2026. Any such submission shall not exceed ten pages in length. If the parties do not advise the court that they have reached an agreement and no submissions are received by these dates, then costs shall be awarded to the respondent in accordance with Tariff B.

Signed this 9th day of January 2026.

"Susan Wong"

Wong J.

Citation: 2026 TCC 7
Date: 20260109
Docket: 2019-964(IT)G

BETWEEN:

WILLOWGLEN SYSTEMS INC.,

Appellant,

and

HIS MAJESTY THE KING,

Respondent.

REASONS FOR JUDGMENT

Wong J.

I. **Introduction/Overview**

[1] The appellant is a software development company based in Edmonton and specializing in industrial automation.

[2] The Minister of National Revenue disallowed the appellant's 2014 SR&ED claim for qualified expenditures in the amount of $1,795,541 with respect to two projects.

II. **Issues**

[3] The issues are as follows:

> (a) Were the appellant's SCADACOM-5 (Supervisory Control and Data Acquisition) and MTCLM (Manual Train Control Logic Module) projects scientific research & experimental development in its taxation year ending July 31, 2014 and specifically, did these activities constitute experimental development?
>
> (b) If so, then what amount are qualified expenditures under subsection 37(8) of the *Income Tax Act*?

[4] The Minister concedes that the zero speed detection work done within the MTCLM project meets the definition of SR&ED, and that the appellant is entitled to qualified SR&ED expenditures of $43,016.19 with respect to this work.

III. **Legal framework**

[5] The definition of SR&ED has not changed since before the taxation year under appeal and reads as follows:[1]

> **"scientific research and experimental development"** means 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, namely, work undertaken for the advancement of scientific knowledge without a specific practical application in view,
>
> (b) applied research, namely, work undertaken for the advancement of scientific knowledge with a specific practical application in view, or
>
> (c) experimental development, namely, work undertaken for the purpose of achieving technological advancement for the purpose of creating new, or improving existing, materials, devices, products or processes, including incremental improvements thereto,
>
> and, in applying this definition in respect of a taxpayer, includes
>
> (d) work undertaken by or on behalf of the taxpayer with respect to engineering, design, operations research, mathematical analysis, computer programming, data collection, testing or psychological research, where the work is commensurate with the needs, and directly in support, of work described in paragraph (a), (b), or (c) that is undertaken in Canada by or on behalf of the taxpayer,
>
> but does not include work with respect to
>
> (e) market research or sales promotion,
>
> (f) quality control or routine testing of materials, devices, products or processes,
>
> (g) research in the social sciences or the humanities,
>
> (h) prospecting, exploring or drilling for, or producing, minerals, petroleum or natural gas,

> (i) the commercial production of a new or improved material, device or product or the commercial use of a new or improved process,
>
> (j) style changes, or
>
> (k) routine data collection.

[6] If an activity is SR&ED, then paragraph 37(1)(a) permits the deduction of current SR&ED expenditures from business income.

[7] When calculating SR&ED expenditures using the proxy method[2] and clause 37(8)(a)(ii)(B) as it read in 2014, expenses on or in respect of SR&ED include only those incurred by the taxpayer in the year each of which is:

> (I) [Repealed]
>
> (II) an expenditure of a current nature in respect of the prosecution of scientific research and experimental development in Canada directly undertaken on behalf of the taxpayer,
>
> (III) [Repealed]
>
> (IV) that portion of an expenditure made in respect of an expense incurred in the year for salary or wages of an employee who is directly engaged in scientific research and experimental development in Canada that can reasonably be considered to relate to such work having regard to the time spent by the employee thereon, and, for this purpose where that portion is all or substantially all of the expenditure, that portion shall be deemed to be the amount of the expenditure, or
>
> (V) the cost of materials consumed or transformed in the prosecution of scientific research and experimental development in Canada,…
>
> (VI) [Repealed]

[8] The criteria first set out in *Northwest Hydraulic Consultants Ltd.*[3] continue to be used when determining whether a set of activities fits within the definition of SR&ED. The Federal Court of Appeal has endorsed this approach on numerous occasions[4] and summarized the criteria as follows:[5]

> (a) Was there a technological risk or uncertainty which could not be removed by routine engineering or standard procedures?
>
> (b) Did the person claiming to be doing SRED formulate hypotheses specifically aimed at reducing or eliminating that technological uncertainty?

(c) Did the procedure adopted accord with the total discipline of the scientific method including the formulation, testing and modification of hypotheses?

(d) Did the process result in a technological advancement?

(e) Was a detailed record of the hypotheses tested, and results kept as the work progressed?

IV. The Appellant — Factual Background

[9] The court heard from the appellant's witnesses Wayne Karpoff (CEO of the appellant), Douglas Kruger (engineer), Glen Kahler (VP of engineering for the appellant), and Trevor Mowbrey (the appellant's chief financial officer).

[10] The appellant is a software development company based in Edmonton and specializing in industrial automation. It started as Datek Industries when it was founded in 1971 and changed its name to Willowglen on acquiring the latter in the early 1990s.

[11] Mr. Karpoff has bachelor's and master's degrees in computing science, joined the appellant in 2009, and was its president and CEO in 2014. While he could not recall how many employees they had in 2014, he stated that as of the date of hearing, the appellant had about a hundred employees of which 86% held at least a bachelor's degree and 16% held at least one graduate degree.

[12] He testified that the appellant had a proud history of innovation and being the company that large companies went to for solutions to difficult problems. By way of example, he stated that the appellant created the first electronic teletype because CN Railways needed to move away from mechanical ones.

[13] He stated that in 2014, most of the appellant's work was done for the oil and gas industry.

V. SCADACOM-5 (Supervisory Control and Data Acquisition) project

(a) Factual background

[14] Mr. Kruger is an electrical engineer with specializations in digital electronics, analog electronics, and control systems, as well as a master's degree in engineering specializing in machine learning (i.e. artificial intelligence). He stated that he joined

the appellant (when it was Datek) as an engineer out of university in 1990 and stayed until 1997; he rejoined the appellant as director of engineering and left in 2017 when he moved to New Zealand.

[15] He explained that the SCADA system is a software framework which controls operations remotely by using computers (i.e. hardware) in the field. He stated that since the introduction of SCADA in the 1940s or 1950s, it has been used to monitor and control increasingly complex systems such as light rail trains and oil & gas pipelines with the goal of maximizing efficiency. Information/data is retrieved from remote devices in the field and communicated/transferred to a centralized location for analysis and decision-making by human beings historically and now increasingly, by a complex combination of human beings, automated processes, and artificial intelligence. In other words, the data acquired using SCADA enables the supervisory control exercised through SCADA.

[16] He testified that with respect to pipelines, the SCADA system enables pressure- and temperature-monitoring such that the pipeline system can operate at nearly 100% capability while simultaneously avoiding the danger of over-pressurization. He explained that SCADA enables the operator to remotely open/close valves and turn pumps on/off, among other things. He stated that without a SCADA system, the pipeline would have to operate at a lower pressure and temperature for safety reasons. Therefore, a SCADA system helps reduce the operating cost of a pipeline while also lessening the pipeline's environmental impact by reducing power consumption and minimizing pressure fluctuations (thus increasing safety). He stated that a company such as Suncor operates thousands of kilometres of pipeline and without a SCADA system, they would need to employ significantly more people to achieve the same level of supervisory control.

[17] Mr. Kruger testified that a SCADA system also manages alarms. He explained that a pipeline system will have thousands of points from which information/data flows so pre-assigned alarm levels can be created to notify the system operator about critical problems such as excessively high pressure readings. The operator can then take the necessary action remotely such as turn pumps on/off and open/close valves to preserve the pipeline system.

[18] He stated that SCADA systems exist in many areas with a range of potential consequences should something go wrong. For example, a water treatment plant that goes down for several hours will likely have less serious consequences than a light rail transit system (LRT) going down for the same length of time. He described the latter as "mission critical" situations which typically involve larger enterprises at

risk of significant economic and/or safety consequences if their systems failed to operate properly.

[19] In addition to the Suncor pipeline, the appellant's SCADA technology is used by PowerGas in Singapore to control a natural gas pipeline. It is also used by Northwest Territories Power to monitor diesel power generators responsible for generating electricity for the city of Yellowknife. as well as at JFK airport to link the public address (PA) system with other control systems.

[20] He stated that the largest deployment of the appellant's SCADA technology is the city of Ottawa's LRT system. He explained that SCADACOM integrates 16 subsystems within Ottawa's LRT system and without it, 16 separate systems would be required to monitor such things as emergency doors, cameras, and alarms.

[21] SCADACOM-5 is the iteration at issue in this appeal. Mr. Kruger explained that when the appellant acquired the original Willowglen in the early 1990s, it inherited an unfinished version of SCADACOM-2 which it then finalized despite being aware of its inherent shortcomings. He stated that the appellant then began building SCADACOM-3 and he was a member of that original team.

[22] He stated that SCADACOM-3 was built between 1993 and 1997; there was also a significant minor release called SCADACOM-3.1 between 2000 and 2002. He described SCADACOM-3 as state-of-the-art when he left the appellant in 1997. He explained that the appellant then moved directly from version 3.1 to version 5, choosing to avoid using the number 4 to name the next version out of concern for possible negative connotations by their Chinese client for that number.

[23] He testified that the appellant began working on SCADACOM-5 in about 2010. When he rejoined the appellant in 2013, the SCADACOM-3 technology was obsolete and the appellant's work on SCADACOM-5 was well underway. He stated that by the end of 2014, a functional version of SCADACOM-5 was completed, with certain foundational components carried over from SCADACOM-3 because the previous concept was still sufficient. It also became necessary to speak to Suncor and Singapore's PowerGas about SCADACOM-3's limitations in light of their needs.

[24] He recalled rolling out the beta version (i.e. a nearly complete version) of SCADACOM-5 to Suncor that year because Suncor wished to do a controlled rollout, plus they were only a 15-minute drive from the appellant in case something went wrong. Suncor designated five of its pipelines for the beta testing while its

remaining approximately 95 pipelines stayed on the existing system. He stated that the controlled testing gave senior Suncor operators an opportunity to give the appellant feedback with a view to building a better product in the end.

[25] One of the appellant's stated objectives for SCADACOM-5 was increasing the number of data points (i.e. pieces of information) to be handled by the system at once, from 10,000 to 4 million.[6] Mr. Kruger explained that while it was one thing to simply store 4 million pieces of information, it was a much greater challenge to handle 4 million data points which changed once per second. The appellant ultimately did not attain this goal and Mr. Kruger stated that he was unaware of any system with the capability yet.

[26] The appellant also aimed for SCADACOM-5 to be compatible with a variety of hardware rather than only one proprietary type, as was the case with SCADACOM-3. Mr. Kruger explained that using one brand of hardware limited the system's versatility because users could not choose from the many other brands on the market such as Toshiba, HP, and Dell. It also limited the system's graphics, particularly as Windows operating systems grew in popularity. As a result, the appellant also aimed to develop SCADACOM-5 for a web-browser based system.

[27] Mr. Kruger testified that with SCADACOM-5, the appellant had to address cyber-security to an extent they had not contemplated before. He explained that when SCADACOM-3 was built in the mid-1990s, security was a generic concern for an isolated/closed-loop (i.e. self-contained) system. On the other hand, with a web-browser based system, the appellant would need to integrate a third-party product called Crowd to safeguard user information such as passwords.

[28] Mr. Kruger explained that they hoped integrating Crowd would be a matter of plugging it into their SCADACOM system. However, after a few months, they discovered a problem with timely synchronization of Crowd data between multiple servers. Simply put, if a user entered their password (i.e. Crowd data) in one application, it was very important that the user's password access registered across applications simultaneously despite each application going through a different server. Synchronization was needed to enable the user to remotely take timely steps which might be necessary in a particular situation.

[29] He stated that as a stop-gap measure, the appellant initially dealt with the synchronization problem by taking sequential snapshots and storing them in each successive server every time. He testified that they eventually tried storing Crowd within a database management system called MySQL and developed a different

method for synchronizing the information across multiple servers. He stated that it was much closer to what they needed but there was never a final answer in the end.

[30] Lastly, the physical workstation required to manage alarm systems and hardware under SCADACOM-3 required an overhaul in light of SCADACOM-5's web-based browser system. Mr. Kruger explained that it became necessary to move away from a single operations workstation to a physical separation of the data centre (where the servers were located) from the control centre (where the operators were located) for practical and security reasons. On the practical side, he stated that the servers were rack-mounted (i.e. installed horizontally), noisy, and physically larger so they generated heat and required extra cooling. On the security side, he stated that one would want the servers to be isolated as much as possible and offline to guard against hacking and tampering.

(b) Analysis and discussion

[31] It was clear that Mr. Kruger was very knowledgeable about the subject matter, although I must admit I found his testimony difficult to follow at times. He described the technology as complicated, as is inevitably the case in most SR&ED matters. It is a particular skill to explain complex concepts in simple terms and why an expert witness can sometimes be of specific assistance to the court.

[32] In determining whether the SCADACOM-5 project was SR&ED, the question is whether the activity was experimental development as described in paragraph (c) of the SR&ED definition, i.e. was the work undertaken for the purpose of achieving technological advancement for the purpose of creating new, or improving existing, materials, devices, products or processes, including incremental improvements thereto?[7]

[33] Paragraph (d) of the SR&ED definition clarifies and arguably expands the work described in paragraphs (a) to (c) to include engineering, design, operations research, mathematical analysis, computer programming, data collection, testing or psychological research, where the work is commensurate with the needs and directly in support of the SR&ED activity in question.[8]

[34] Certain types of work are excluded from the definition, such as (f) quality control or routine testing of materials, devices, products or processes, and (i) commercial production of a new or improved material, device or product or the commercial use of a new or improved process.

(i) Was there a technological risk or uncertainty which could not be removed by routine engineering or standard procedures?

[35] There is no technological uncertainty if the resolution of the problem is reasonably predictable using standard procedure or routine engineering.[9] Routine engineering consists of techniques, procedures and data generally accessible to competent professionals in the field.[10]

[36] While it was clear that the appellant faced many obstacles in developing SCADACOM-5, I cannot find there was technological uncertainty as contemplated by this criterion. Creating a new product using techniques, procedures and data that are generally available to competent professionals in the field is not SR&ED even if it is unclear as to how the objective might be accomplished.[11] While there is clearly uncertainty, it is not always technological uncertainty.[12]

[37] SCADACOM-3 was built in the mid-1990s and its technology was understandably obsolete by the time the appellant's work on SCADACOM-5 began twenty years later, culminating in a functional version by the end of 2014. The appellant's efforts to develop a browser-based system and move away from using a proprietary brand of hardware was more in the nature of catching up with a browser-based external world and bringing an outdated system into the 21st century, i.e. product research and development.[13]

[38] To develop a browser-based system, it was necessary for the appellant to integrate existing third-party software to introduce user passwords and deal with the accompanying security and synchronization issues. The appellant also attempted to synchronize information across multiple servers by first taking sequential snapshots and storing them in successive servers, and then trying a third-party database management system combined with a different way of synchronizing. In both instances, the appellant used routine engineering and standard procedures including third-party software for its intended purpose.

[39] With respect to the appellant's objective to increase the number of data points from the 10,000 points handled by SCADACOM-3 to 4 million points, Mr. Kruger described the challenge as a data-refresh issue and one of scalability. The challenge seemed again to be one in the nature of bringing an obsolete system into the 21st century by using skilled software developers and applying generally available knowledge to increase the amount of information which could be handled by the system, i.e. product research and development.[14]

[40] The fact that the appellant ultimately did not achieve its goal of 4 million data points and no system has this capability yet does not necessarily point to a technological uncertainty for SR&ED purposes. The appellant aimed high with 4 million data points — as Mr. Karpoff said the appellant is wont to do — but there is no evidence that the appellant used more than routine engineering or standard procedures. The Federal Court of Appeal has said that while being creative, SR&ED research objectives must also be realistic;[15] I would say this principle applies to experimental development as well.

(c) Conclusion with respect to whether the activity was SR&ED

[41] On a balance, I am unable to find that there was a technological risk or uncertainty associated with the appellant's SCADACOM-5 activity. As I have answered this question in the negative, it is unnecessary for me to examine the remaining four criteria.

(d) What amounts are qualified expenditures under subsection 37(8) of the Act?

[42] Expenditures totaling $1,795,541 were disallowed, comprised of $1,293,692 and $501,850 with respect to the SCADACOM-5 and MTCLM projects, respectively.[16] The disallowed amounts are employee wages, although the respondent does not dispute that the appellant paid these amounts to its employees.[17]

[43] As I have found the SCADACOM-5 work not to be SR&ED, no amount of the disallowed $1,293,692 are qualified expenditures.

VI. **The MTCLM (Manual Train Control Logic Module) project**

(a) Factual background

[44] Mr. Kahler is the appellant's VP of engineering. He has a BSc in electrical engineering and is a registered professional engineer in Alberta. He joined the appellant as operations manager in 2013 and was eventually promoted to VP of engineering in 2020. He stated that he had almost 30 years of experience in the electronics and engineering fields, including Sierra Wireless for 15 years during which he worked on about a dozen first-to-market product developments as a test engineer, manufacturing engineer, and senior director of manufacturing, among other roles. He stated that as the appellant's VP of engineering, he is responsible for product development.

[45] He stated that the MTCLM project began in about 2011 for their client Bombardier Transportation (now Alstom), who asked the appellant to build a device for a driverless train. The device would enable a driver who boards the autonomous train to manually drive it in emergency or maintenance situations.

[46] In discussions with Bombardier, it became clear that they wanted more than to simply be able to manually drive the train. Firstly, they wished to move away from their controls being spread throughout the train and instead reconfigure control functions plus train-line functions to run through a central box. Bombardier envisioned doing so via a series of gate arrays (i.e. programmed specific logic functions) and relays (switches).

[47] However, Bombardier also wanted their centralized controls to operate at Safety Integrity Level 4 (SIL 4). Mr. Kahler explained that SIL is an international measurement used in functional safety engineering, with level 4 being the highest. He explained that functional safety is about reducing the probability of failure to as low a level as possible, and is related to reliability. He stated that SIL 2 is a typical level and found in many processing industries while SIL 4 was very uncommon; rail was the only industry he was immediately aware of which used a SIL 4 standard.

[48] He testified that once Bombardier expressed that it wanted a SIL 4 level central train control box, the appellant knew its initial design of gate arrays and relays would not work. He explained that gate arrays and relays would mean programming in a set of conditions which would turn a relay on or off. One gate array controlling one relay would be a point of failure if it did not function properly, which was not tolerable in a SIL 4 level safety system. He stated that they needed to establish sufficient redundancy by creating multiple gate arrays to control multiple outputs such that if a failure was detected, it would trigger a failsafe mode so as not to affect people or the environment.

[49] To design the control box, the appellant had to meet Bombardier's internal standards as well as Bombardier's custom list of North American and international standards[18] for safety, reliability, design for environment (DFE), and electromagnetic interference (EMI), among others. Mr. Kahler stated that the list evolved over time but most of the standards were objectives in 2014. He explained that meeting the SIL 4 level requirement was difficult, especially in light of the various other standards to be met. For example, DFE requirements dictate the use of lead-free components which would be state-of-the-art. However, lead-free components lacked the reliability required under the MIL (military) standard.[19]

[50] He gave a specific example involving the emergency brake safety relay assembly, where the appellant initially attempted to build the relay in the standard manner directed by Bombardier. In December 2013, the appellant had to advise Bombardier that building it that way would not meet their SIL 4 level, so the appellant suggested a possible redesign to increase the diagnostic lines and the amount of monitoring.[20] Bombardier's RAMS team (i.e. a group of engineers overseeing reliability, availability, maintainability, and safety) reviewed the appellant's recommendation, agreed that the existing design was not SIL 4-compliant and instructed the appellant to proceed.[21] The appellant then provided Bombardier with two options, one of which would attempt to modify an existing relay board while the other involved creating a new, redesigned board; he stated that Bombardier chose the latter.[22]

[51] Mr. Kahler testified that the appellant then spent a great deal of time prototyping, and explained that seven or eight boards actually had to be redesigned rather than one, along with a mechanical design and a solution for resulting cabling challenges. He explained that after testing the prototype boards at the subsystem level, the appellant then had to create an entire prototype manual control box to test how everything worked together. He explained that multiple engineers would work on multiple systems simultaneously, but only the final prototype would show them what the problems were.

[52] He described it as an iterative process and stated that the first prototype control box took weeks to build and wire by hand, describing it as completely different than the product which exists now. He stated that once the SIL 4 requirement was added, the wiring had to change from point-to-point to point-to-multiple-point in terms of where the lines went,[23] the entire firmware (i.e. software permanently embedded in hardware) had to change to add diagnostic functions, and these changes compounded to lead to more changes.

[53] With respect to wiring, Mr. Kahler described the first prototypes as a crow's nest of wires which took weeks to build but were ultimately not manufacturable. The increased amount of wiring led to a problem meeting the necessary isolation requirements when combining computer logic functions with high voltage functions on the same backplane (circuit board), i.e. a certain amount of physical spacing was needed for safety and reliability.

[54] Mr. Kahler explained that one of the key challenges presented by the SIL 4 requirement in 2014 was the ability to detect zero speed. In other words, the control box had to be able to detect when the train was stopped because zero speed

underpinned many safety functions. For example, a button that opens doors should not be able to operate while the train is moving. He stated that the SIL 4 level set a safety standard but gave no guidance on how to build something which could detect zero speed while operating at the highest safety level.

[55] He explained that to meet the SIL 4 level, they had to satisfy three key concepts: (a) the system must have redundancies so that if one component does not work, another will, (b) failures must be detectable even with redundancies so as to avoid a complete system failure, and, (c) there must be a way to enter a safe state when a failure is detected. He stated that the typical ways of detecting zero speed would be a signal sent from the propulsion system or a message received via the CAN bus system, which is a communication system between electronic components. However, the propulsion system lacked the necessary redundancies and the CAN bus system was not designed with safety in mind.

[56] He stated that the iterative design process required testing for EMI (electromagnetic interference), EMC (electromagnetic compatibility), shock, and vibration in an accredited lab. He explained that they used routine engineering practices to test various hypotheses and try to find solutions. For example, at one point, the testing showed that zero speed functionality was unreliable when the EMI was strong. The train's speed sensor measured speed in pulses and EMI generated pulses which looked real but were not. In about October 2013, they successfully incorporated a state machine which was a programming model capable of distinguishing between the types of signals. He estimated that resolving the zero speed issue took about six months in total.

[57] Mr. Kahler stated that during the period under appeal, the appellant completed a configuration of the module and it was used for one client project.[24] He testified that the MTCLM then underwent multiple iterations toward completion of the current version in about 2017.

[58] He stated that a central box is much more standard now but back in 2014, there was no box that performed as theirs did and no roadmap for how to build one. He recalled that MEN Micro introduced a SIL 4 train control box in 2017; however, it was only a control device and unable to manage any train-line functions. He described the appellant's current version as the train's brain, being able to control and manage the operation of the train as well as maintain diagnostics on vital train-line functions such as emergency brakes, propulsion, and the doors. He stated that the MTCLM has since been renamed VIM (Vehicle Integrity Module) to better

describe its function and that Alstom (previously Bombardier Transportation) continues to use the system to this day.

(b) Analysis and discussion

[59] My conclusion with respect to the appellant's SCADACOM-5 project makes it very clear that the MTCLM project was SR&ED.

[60] In considering whether the appellant's MTCLM activities constitute experimental development as described in paragraph (c) of the SR&ED definition, Chief Justice Bowman's comments in Northwest Hydraulic are insightful:[25]

> [8] The appellant relies particularly on paragraph (c) of that definition. Paragraph (c) in the French version reads:
>
> > (c) le développement expérimental, à savoir les travaux entrepris dans l'intérêt du progrès technologique en vue de la création de nouveaux matériaux, dispositifs, produits ou procédés ou de l'amélioration, même légère, de ceux qui existent.
>
> [9] I quote this paragraph simply because the words, "de l'amélioration, même légère, de ceux qui existent" seem to clarify any ambiguity that may be found in the words "including incremental improvements thereto".
>
> [10] The addition of these words in 1995 applicable to taxation years ending after December 2, 1992 appears to have been in response to a concern that the achievement or attempted achievement of slight improvements was not covered. I should not have thought it was necessary to say so. Most scientific research involves gradual, indeed infinitesimal, progress. Spectacular breakthroughs are rare and make up a very small part of the results of SRED in Canada.
>
> [11] The tax incentives given for doing SRED are intended to encourage scientific research in Canada (*Consoltex Inc. v. The Queen*, 97 DTC 724). As such the legislation dealing with such incentives must be given "such fair, large and liberal construction and interpretation as best ensures the attainment of its objects" (*Interpretation Act*, section 12).

[61] I must consider whether the purpose of the work was technological advancement for the purpose of creating new (or improving existing) materials, devices, products, or processes, including incremental improvements. I would say the answer is yes.

(i) Was there a technological risk or uncertainty which could not be removed by routine engineering or standard procedures?

[62] Technological uncertainty cannot be predictably resolved by using standard procedures or routine engineering.[26] Further, a system uncertainty is a type of technological uncertainty.[27] The CRA's SR&ED glossary describes "system uncertainty" as:

> [A] form of technological uncertainty that can arise from or during the integration of technologies, the components of which are generally well known. This is due to unpredictable interactions between the individual components or sub-systems.[28]

[63] Here, the cumulative uncertainties in creating a central train control box capable of operating at the SIL 4 level combined to form a system uncertainty which in turn was the control box itself.[29] The appellant had no guidance for building a control box capable of detecting zero speed and managing train-line functions while also operating at the highest safety level. The fact that the train must be completely stopped (i.e. at zero speed) to enable the operation of many other safety functions combined with the challenge that all of these functions had to operate at the SIL 4 level, exemplifies the integration of technologies described in the CRA definition. I would contrast this type of innovative uncertainty with that which accompanied the SCADADOM-5 work, where the question was how to bring something obsolete into the present day.

[64] Therefore, the first criterion of technological uncertainty is met.

(ii) Did the appellant formulate hypotheses specifically aimed at reducing or eliminating that technological uncertainty?

[65] *Northwest Hydraulic* sets out a five-stage process for this step:[30]

(a) observation of the subject matter of the problem;

(b) formulation of a clear objective;

(c) identification and articulation of the technological uncertainty;

(d) formulation of an hypothesis or hypotheses designed to reduce or eliminate the uncertainty; and

(e) methodical and systematic testing of the hypothesis or hypotheses.

[66] While a technological uncertainty must be identified at the beginning, it is integral to SR&ED that new technological uncertainties might present along the way and the scientific method (including intuition, creativity, and sometimes genius) be used to uncover, recognize, and resolve them as well.[31]

[67] The appellant's initial hypothesis of designing a centralized control box became that of building one capable of operating at the SIL 4 level. The revised hypothesis led to the change to point-to-multiple-point wiring to create system redundancies for added safety. That in turn resulted in a need to change the embedded software (i.e. the firmware) to add diagnostic functions for added safety, which in turn led to other changes becoming necessary. For example, the increased amount of wiring necessitated a change in physical spacing to enable the software to function properly in a high-voltage environment, i.e. the physical size of the device became an issue.

[68] With respect to the requirement that the control box be able to detect zero speed before triggering other safety functions at the SIL 4 level, the appellant methodically tested the effect of various types of interference on their prototypes in an accredited lab. When the appellant discovered that electromagnetic interference (EMI) reduced the box's ability to detect zero speed, the appellant identified the effect of the EMI interference and incorporated a program capable of distinguishing between EMI pulses and genuine speed pulses.

[69] The appellant's ultimate and interim objectives were clear, each technological uncertainty was identified and articulated as it presented itself, the appellant formulated hypotheses to deal with each uncertainty as it arose, and did so with methodical and systematic testing. The fact the appellant used routine engineering methods to test its theories is expected while creating an innovative device intended to meet existing standards it was not required to meet before. It would be illogical to use innovative tests to evaluate whether existing standards have been met.

[70] Therefore, this criterion has been met.

(iii) Did the procedure adopted accord with the total discipline of the scientific method including the formulation, testing and modification of hypotheses?

[71] Routine activity is not distinguished from SR&ED solely by adherence to systematic routines, but the adoption of the entire scientific method (including intuitive creativity) with a view to removing a technological uncertainty through the formulation and testing of innovative and untested hypotheses.[32]

[72] The appellant formulated and tested individual hypotheses involving uncertainties as they arose, all toward resolving the ultimate system uncertainty. It did so in a scientific manner which was at times intuitive and/or creative as described in my analysis with respect to the second criterion above.

[73] Therefore, this criterion has been met.

(iv) Did the process result in a technological advancement?

[74] The appellant was able to complete a functional configuration of the device during the period under appeal, and went through several more experimental cycles before completing the current version of the control box in about 2017. Mr. Kahler stated that in 2017, another company produced a SIL 4 control box but it could not manage train-line functions (i.e. it was not centralized). The distinction between a box which could control some things versus a box which could control everything is significant. It is a technological advancement.

[75] Therefore, this criterion has been met.

(v) Was a detailed record of the hypothesis tested, and results kept as the work progressed?

[76] The appellant kept contemporaneous detailed records as well as provided progress reports to Bombardier. Those records took the form of handwritten lab notes,[33] creating schematics during the wiring stage,[34] maintaining a running record of test results and including them in regular progress reports to Bombardier.[35] Mr. Kahler stated that on joining the appellant, he found the level of record-keeping to be surprisingly detailed for a small company.[36] I would respectfully agree.

[77] Therefore, this criterion has been met.

(c) Conclusion with respect to whether the activity was SR&ED

[78] As indicated at the outset, the respondent has conceded that the work done with respect to the zero speed detection was SR&ED. In this context of a system

uncertainty, zero speed detection was a challenge accompanied by other challenges on the way to resolving the ultimate challenge of creating a centralized SIL 4-level control box, with the latter being the SR&ED activity for the purposes of the definition.

[79] I am satisfied that the appellant's work with respect to the MTCLM project in its 2014 taxation year was SR&ED qualified work and specifically, experimental development.

(d) What amount are qualified expenditures under subsection 37(8) of the Act?

[80] As indicated earlier, expenditures totaling $1,795,541 were disallowed, comprised of $1,293,692 and $501,850 with respect to the SCADACOM-5 and MTCLM projects, respectively.[37] The disallowed amounts are employee wages, although the respondent does not dispute that the appellant paid these amounts to its employees.[38]

[81] Mr. Kahler explained that where an employee's work was considered to contribute directly to SR&ED, the appellant claimed the wage at a factor of 1.0 (i.e. 100%); where an employee's work was considered to be supporting in nature, then a factor of 0.6 (i.e. 60%) was applied.[39] He gave as an example a weekly project managers meeting during which MTCLM would be discussed along with other unrelated projects.[40] He gave as another example, work done by employees to keep the appellant running at a more general level and enable the SR&ED work to be done.[41]

[82] With respect to the time records themselves, Mr. Kahler explained that employees submitted daily timesheets to the particular project manager who approved them weekly and monthly. For the purposes of an SR&ED claim, the time records would be consolidated to a single master spreadsheet showing totals by project and employee for the taxation year in question.[42] He stated that it was usually up to the respective project managers as well as the appellant's VP of operations and the chief financial officer to evaluate the actual work done and decide if it would form part of the SR&ED claim.[43]

[83] In addition to the master spreadsheet,[44] the Court was provided with a sample of the source timesheets, and summaries showing the hours-per-employee-per-project versus dollars-per-employee-per-project.[45] Mr. Kahler stated that on joining the appellant, he found their level of timekeeping

down to 15-minute increments for SR&ED purposes to be more granular than what he had been accustomed at a larger company.[46]

[84] I cannot agree with the respondent's contention that this level of granularity is insufficient or that applying a mathematical factor of 0.6 is unreasonable in these circumstances where: (a) the respondent does not challenge that the amounts were paid, and (b) the Court has found there to be a system uncertainty. I also cannot agree with the respondent that providing the Court with a sample of the source timekeeping records and the resulting is insufficient or unreasonable here.

[85] The respondent tendered read-ins and answers to undertakings from the examination for discovery of Mr. Kruger showing conflicting information with respect to the number of employee hours claimed with respect to the thrust control lever assembly of the control box.[47] The respondent also tendered a written discovery answer given by the appellant's CFO Mr. Mowbrey acknowledging that the appellant should have claimed 19.5 hours rather than 158 hours with respect to this assembly.[48]

[86] When put to Mr. Mowbrey in cross-examination, he did not recall his own response nor Mr. Kruger's preceding answers to undertakings which gave rise to the subsequent question to Mr. Mowbrey.[49] When asked whether he could provide a wage amount with respect to his written discovery answer that 19.5 hours should have been claimed, he said no.[50]

[87] During further cross-examination of Mr. Mowbrey, respondent's counsel proposed that based on Mr. Kruger's answer to undertaking #6 showing 19.5 hours[51] and her own extensive review of the appellant's timekeeping spreadsheet, it appeared that the total wage claim for the 19.5 hours should total $945.35 based on employee 448's hourly rate of $63.97 and employee 18's hourly rate of $34.50. Mr. Mowbrey stated that he was unable to recall.[52]

[88] I am satisfied that the appellant's SR&ED claim for the MTCLM project should be reduced by 138.5 hours (i.e. 158 hours minus 19.5 hours). Based on Mr. Mowbrey's response in cross-examination, I am also satisfied that the appellant is unable to delineate the dollar value of the discrepancy.

[89] As a principled basis, I will use the factor resulting from 19.5 hours divided by $945.35, i.e. 0.0206272. Applying the factor of 0.0206272 to 138.5 hours (i.e. dividing 138.5 hours by 0.0206272) equals $6,714.43.

[90] Therefore, the appellant is entitled to qualified expenditures of $495,135.57, being $501,850 less $6,714.43.

VII. **Conclusion**

[91] The appeal is allowed on the basis that:

(a) the appellant's activities with respect to the MTCLM project constituted SR&ED in its taxation year ending July 31, 2014;

(b) the appellant incurred qualified SR&ED expenditures with respect to the MTCLM project in the amount of $495,136 for that year;

(c) the appellant's activities with respect to the SCADACOM-5 project did not constitute SR&ED in its taxation year ending July 31, 2014 and no amount of the disallowed $1,293,692 are qualified expenditures.

[92] In light of the respondent's substantial success, the respondent is entitled to costs. I strongly encourage the parties to accede to tariff costs, as there is no apparent basis for another amount.

[93] In any event, the parties shall have until April 9, 2026 to reach an agreement as to costs, failing which the respondent shall file written submissions by May 11, 2026 and the appellant shall file a written response by June 11, 2026. Any such submissions shall not exceed ten pages in length. If the parties do not advise the court that they have reached an agreement and no submissions are received by these dates, then costs shall be awarded to the respondent in accordance with Tariff B.

Signed this 9th day of January 2026.

"Susan Wong"

Wong J.

CITATION:	2026 TCC 7
COURT FILE NO.:	2019-964(IT)G
STYLE OF CAUSE:	WILLOWGLEN SYSTEMS INC. AND HIS MAJESTY THE KING
PLACES OF HEARING:	Edmonton, Alberta Ottawa, Ontario (virtual)
DATES OF HEARING:	December 4-7, 2023 May 28-29, 2024
REASONS FOR JUDGMENT BY:	The Honourable Justice Susan Wong
DATE OF JUDGMENT:	January 9, 2026

APPEARANCES:

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[1] Subsection 248(1)

[2] Subsection 37(10)

[3] *Northwest Hydraulic Consultants Ltd v. The Queen*, 1998 CanLII 553 (TCC) at paragraph 16

[4] *National R&D Inc. v. Canada*, 2022 FCA 72 at paragraphs 9 and 11, affirming 2020 TCC 47; *Kam-Press Metal Products Ltd. v. Canada*, 2021 FCA 88, 2021 CarswellNat 1288 at paragraph 7, affirming 2019 TCC 46; *R&D Pro-Innovation Inc. v. Canada*, 2016 FCA 152, 2015 D.T.C. 5066 at paragraph 4; *Jentel Manufacturing Ltd. v. Canada*, 2011 FCA 355, 2012 D.T.C. 5031 at paragraph 6; *C.W. Agencies Inc. v. Canada*, 2001 FCA 393, 2002 D.T.C. 6740 at paragraph 17

[5] *CW Agencies Inc. v. Canada*, 2001 FCA 393 (CanLII) at paragraph 17

[6] Exhibit A-1, volume 1, tab 8

[7] Subsection 248(1)

[8] Subsection 248(1)

[9] *Northwest Hydraulic Consultants Ltd v. The Queen*, 1998 CanLII 553 (TCC) at paragraph 16

[10] *Northwest Hydraulic Consultants Ltd v. The Queen*, 1998 CanLII 553 (TCC) at paragraph 16

[11] *Béton mobile du Québec Inc v. The Queen*, 2019 TCC 278 at paragraph 43; *Flavor Net Inc v. The Queen*, 2017 TCC 179 at paragraph 38

[12] *Béton mobile du Québec Inc v. The Queen*, 2019 TCC 278 at paragraph 43; *Flavor Net Inc v. The Queen*, 2017 TCC 179 at paragraph 38

[13] *Highweb & Page Group Inc v. The Queen*, 2015 TCC 137 at paragraph 18

[14] *Highweb & Page Group Inc v. The Queen*, 2015 TCC 137 at paragraph 18

[15] *RIS-Christie Ltd. v. Canada*, 1998 CanLII 8876 (FCA) at paragraph 13

[16] Notice of appeal at paragraph 19; Reply at paragraphs 20, 23, and schedule A; Exhibit A-1, volume 2, tab 82 at pages 838 and 854

[17] Respondent's written submissions (filed on April 25, 2024) at paragraph 100

[18] Exhibit A-1, volume 1, tab 48

[19] Exhibit A-1, volume 1, tab 48

[20] Exhibit A-1, volume 1, tab 53

[21] Exhibit A-1, volume 1, tab 55

[22] Exhibit A-1, volume 1, tab 54

[23] Exhibit A-1, volume 2, tab 66, pages 695 to 697

[24] Exhibit A-1, volume 2, tab 66

[25] *Northwest Hydraulic Consultants Ltd v. The Queen*, 1998 CanLII 553 (TCC) at paragraphs 8 to 11

[26] *Northwest Hydraulic Consultants Ltd v. The Queen*, 1998 CanLII 553 (TCC) at paragraph 16

[27] *1726437 Ontario Inc. (AirMax Technologies) v. The Queen*, 2012 TCC 376 (CanLII) at paragraph 17; *A & D Precision Limited v. The Queen*, 2019 TCC 48 (CanLII) at paragraphs 57 and 58; *Paveit Construction Inc. v. The King*, 2025 TCC 129 (CanLII) at paragraph 38; *Buhler Versatile Inc. v. The King*, 2023 TCC 18 (CanLII) at paragraph 57; *6379249 Canada Inc. v. The Queen*, 2015 TCC 77 (CanLII) at paragraphs 42, 49, and 69; *Gabie v. the Queen*, 1998 CanLII 419 at paragraph 16

[28] Canada Revenue Agency SR&ED Glossary, updated as of August 13, 2021

[29] *A & D Precision Limited v. The Queen*, 2019 TCC 48 (CanLII) at paragraph 59; *1726437 Ontario Inc. (AirMax Technologies) v. The Queen*, 2012 TCC 376 (CanLII) at paragraph 16

[30] *Northwest Hydraulic Consultants Ltd v. The Queen*, 1998 CanLII 553 (TCC) at paragraph 16

[31] *Northwest Hydraulic Consultants Ltd v. The Queen*, 1998 CanLII 553 (TCC) at paragraph 16

[32] *Northwest Hydraulic Consultants Ltd v. The Queen*, 1998 CanLII 553 (TCC) at paragraph 16

[33] Exhibit A-1, volume 2, tab 79,

[34] Exhibit A-1, volume 1, tab 52

[35] Exhibit A-1, volume 1, tabs 53 to 59 and volume 2, tabs 60 to 65

[36] Transcript of proceedings on December 6, 2023, page 66 at lines 21 to 26

[37] Notice of appeal at paragraph 19; Reply at paragraphs 20, 23, and schedule A; Exhibit A-1, volume 2, tab 82 at pages 838 and 854

[38] Respondent's written submissions (filed on April 25, 2024) at paragraph 100

[39] Transcript of proceedings on December 6, 2023, page 110 at line 20 to page 111 at line 11

[40] Transcript of proceedings on December 6, 2023, page 111 at lines 15 to 22

[41] Transcript of proceedings on December 6, 2023, page 111 at line 23 to page 112 at line 13

[42] Transcript of proceedings on December 6, 2023, page 105 at lines 17 to 24; Exhibit A-1, volume 2, tab 81 at pages 759 to 761

[43] Transcript of proceedings on December 6, 2023, page 108 at lines 1 to 11

[44] Exhibit A-1, volume 2, tab 81 at pages 759 to 761

[45] Exhibit A-1, volume 2, tab 81 at pages 762 to 785

[46] Transcript of proceedings on December 6, 2023, page 105 at line 25 to page 106 at line 9

[47] Respondent's read-ins (filed on December 7, 2023) at tab 6, pages 207 and 210

[48] Respondent's read-ins (filed on December 7, 2023) at tab 7, page 213

[49] Transcript of proceedings on December 6, 2023, page 176 at line 20 to page 178 at line 12

[50] Transcript of proceedings on December 6, 2023, page 176 at line 10 to page 177 at line 2

[51] Respondent's read-ins (filed on December 7, 2023) at tab 6, page 207

[52] Transcript of proceedings on December 6, 2023, page 178 at line 4 to page 179 at line 15