Docket: 2018-369(IT)G

BETWEEN:

LOGIX DATA PRODUCTS INC.,

Appellant,

and

HER MAJESTY THE QUEEN,

Respondent.

Appeal and motions heard on December 12 and 13, 2019 at Toronto, Ontario and February 25, 26 and 27, 2020 at Toronto, Ontario

Before: The Honourable Justice K.A. Siobhan Monaghan

Appearances:

Counsel for the Appellant: Jonathan N. Garbutt

Counsel for the Respondent: Angelica Buggie

JUDGMENT

In accordance with the attached Reasons for Judgment;

The appeal from a reassessment of SR & ED expenditures and related ITCs made under the *Income Tax Act* in respect of the Appellant's taxation year ending June 30, 2013 (the "2013 taxation year"), denying that the Appellant's claimed expenditures are scientific research and experimental development and disallowing the related investment tax credits claimed by the Appellant, is dismissed;

Costs of the motions and the appeal are awarded to the Respondent. The parties shall have until June 14, 2021 to come to an agreement on costs, failing which each party shall have until July 12, 2021 to file a single written submission on costs. Each such submission shall not exceed 15 pages in length.

Signed at Ottawa, Canada, this 14th day of May 2021.

"K.A. Siobhan Monaghan"

Monaghan J.

Citation: 2021 TCC 36
Date: 20210514
Docket: 2018-369(IT)G

BETWEEN:

LOGIX DATA PRODUCTS INC.,

Appellant,

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HER MAJESTY THE QUEEN,

Respondent.

REASONS FOR JUDGMENT

Monaghan J.

I. INTRODUCTION

[1] The issue in this appeal is whether expenditures the Appellant, Logix Data Products Inc., incurred in its taxation year ending June 30, 2013 qualify as expenditures on scientific research and experimental development ("SRED") as that term is defined in the *Income Tax Act* (Canada).[1] The Appellant is an information technology services company.

[2] The activity in question is work the Appellant undertook to develop what it describes as a dual purpose solar shingle – that is, a solar panel that could replace shingles. The concept is that the solar shingle would serve as a source of power and be mounted directly on the roof so that shingles would not be necessary.

[3] The Respondent has assessed the Appellant on the basis the expenditures do not qualify as SRED. The Respondent's position is that:

there was no technological uncertainty in the solar shingle project;

[1] R.S.C. 1985 c. 1 (5th Supp.), as amended (the "Act"). SRED is defined in subsection 248(1). It is not necessary to repeat the full definition.

the Appellant did not engage in a systematic investigation to overcome any technological uncertainties in the project;

no experimentation was performed in the project to achieve a technological advancement;

the activities were ones for which the required knowledge was in the public domain; and

the Appellant did not keep sufficient records and documents in respect of the work performed.

[4] The Appellant claims that its activities qualify as SRED.

II. **PRELIMINARY MATTERS: EXPERT REPORT**

A. **The Expert Report and Motion to File Amended Expert Report**

[5] Under section 145(7) of the *Tax Court of Canada Rules (General Procedure)* (the "Rules"),[2] unless otherwise directed by the Court, no evidence in chief of an expert witness will be heard unless the expert report has been both served on the other party not less than 90 days before the commencement of the hearing and prepared in accordance with Rule 145(2). By virtue of Rule 145(3), the expert must comply with the *Code of Conduct for Expert Witnesses* (the "Code")[3] or the Court may exclude all or portions of the expert report.

[6] At least 90 days before the appeal hearing date,[4] the Appellant filed and served on the Respondent an expert report ("Report 1"). However, on November 15, 2019, the Appellant filed a notice of motion seeking leave of the Court to file an amended expert report (the "Amended Report"). The Amended Report is dated October 27, 2019. The notice of motion was filed within 30 days of the scheduled hearing of the appeal. However, it was not served on the Respondent until November 25 or 28, 2019.

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[2] Sections or subsections of the Rules are referred to as Rules in these reasons.

[3] Found in Schedule III to the Rules.

[4] December 12, 2019.

[7] The Appellant's motion was brought on the basis that:

i) in preparing for trial, the expert became aware of errors in Report 1, including typographical errors, that he believed he had a duty to correct in accordance with the Code;

ii) the errors were inadvertent and not deliberate;

iii) the Respondent is not prejudiced because Report 1 was timely served and the expert's overall conclusions remain unchanged, although restated in a different manner in the Amended Report; and

iv) the changes to Report 1 reflected in the Amended Report "correct minor errors and clarify his [the expert's] opinions" so it is in the interests of justice to allow the Amended Report to be filed.

[8] The Respondent objected to the motion, claiming that the Amended Report is in fact a new expert report, filed and served well after the 90-day deadline, and that neither Report 1 nor the Amended Report comply with Rule 145 (including the requirements found in the Code) (collectively "the Expert Report Requirements").

[9] With the permission of the parties, I reviewed Report 1 and the Amended Report prior to hearing the Appellant's motion. I dismissed the Appellant's application to file the Amended Report.

[10] Appellant's counsel suggested that it was not clear that a motion was required because of the expert's duty to report any material changes affecting the expert's opinions expressed or the data contained in the expert report.[5] In other words, he argued that this duty provided the Appellant with the right and obligation to file the Amended Report. The Appellant's assertion was that although the expert's opinions were expressed in a different way, the changes in the Amended Report corrected minor errors and clarified the expert's opinions, but did not change the overall conclusions.

[11] I do not agree with the Appellant's characterization of the differences between the two reports. Contrary to the Appellant's assertion, in my view, the changes reflected in the Amended Report are quite significant. Appendices were added to the Amended Report that were not in Report 1 and appendices in Report 1 were deleted,

[5] This duty is found in section 4 of the Code.

without explanation. Significant parts of the text from Report 1 were deleted, including the assumptions and caveats. The Amended Report is reorganized and written in a way that differs significantly from Report 1. The opinions in the Amended Report are different than those expressed in Report 1.[6]

[12] In other words, in my view, Report 2 is more appropriately characterized as a new expert report rather than an amended expert report. Thus, in my view, the Appellant is not permitted to admit the Amended Report without the Court agreeing to waive compliance with requirement that the expert report be filed and served at least 90 days before the hearing.

[13] However, in the circumstances, I need not decide whether the Court would do so because I agree with the Respondent that the Amended Report does not comply with the Expert Report Requirements.

[14] The Amended Report is stated to be the expert's "independent expert opinion on whether Project 1 constitutes scientific research and experimental development." The opinion expressed is that:

> Project 1 constitutes experimental development in the field of mechanical engineering specific to the semi conductor and photovoltaic industries that was performed by a competent researcher in this field.

[15] With respect, this is not the purpose of an expert report.

> What constitutes scientific research for the purposes of the Act is either a question of law or a question of mixed law and fact to be determined by the Tax Court of Canada, not expert witnesses, as is too frequently assumed by counsel for both taxpayers and the Minister. An expert opinion may assist the court in evaluating technical evidence and seek to persuade it that the research objective did not or could not lead to a technological advancement. But, at the end of the day, the expert's role is limited to providing the court with a set of prescription glasses through which the technical information may be viewed before being analyzed and weighed by the trial judge. Undoubtedly, each opposing expert

[6] Report 1 expresses the expert's disagreement with the CRA's conclusions regarding several aspects of the Appellant's project and expresses opinions that the CRA is wrong. It takes the form of referring to the Appellant's content and then commenting on it. The Amended Report is an opinion that the Appellant's activities constitute SRED and suggests that statements the expert seems to attribute to the Appellant in Report 1 are in fact statements of the expert.

> witness will attempt to ensure that its focal specifications are adopted by the court. However, it is the prerogative of the trial judge to prefer one prescription over another.[7]
>
> [Emphasis added.]

[16] But more particularly, the Amended Report states several opinions without explaining the facts and assumptions on which those opinions are founded[8] or the reasons for the opinions expressed.[9] Nowhere in the Amended Report are the relevant facts and assumptions described. The Amended Report consists largely of conclusory statements - statements without explanation, context or support.

[17] An expert report is required to contain any literature or other materials specifically relied on in support of the opinions.[10] The Amended Report states the expert's knowledge relevant to the matters considered in formulating his opinions was gained from his own experience and reading the scientific literature. None of that scientific literature is appended or even described. The only research referred to is CRA's Policy Paper and "research into commercially available solutions."[11]

[18] In addition to a list of the Appellant's documents[12] that the expert said he reviewed, the Appendices consist largely of CRA Policy Papers and the Appellant's or CRA's documents relevant to the Appellant's SRED claim, the CRA's review of that claim, and the appeal. The only appendices that do not fit that description are the expert's resume, a copy of a US patent for a frame design for a roof-integrated solar panel, and an article from a Facebook page that is described as a research paper.[13] Yet the Amended Report states the expert has considered "prior art in the field of this technology, thermal design technologies and structural design considerations gained from reading scientific literature." Beyond that statement, none of this material considered, or scientific literature reviewed, is described in the

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[7] *RIS-Christie Ltd*. v. *The Queen* [1998] F.C.J. No 1890, [1999] 1 CTC 132 (FCA) [*RIS-Christie*], at para. 12.

[8] See paragraph 3(d) of the Code.

[9] See paragraph 3(g) of the Code.

[10] See paragraph 3(h) of the Code.

[11] How or where this latter research was conducted is not explained.

[12] These are the same documents that the Appellant produced for the Court as evidence of the SRED work completed.

[13] It is not a research paper. It appears to be a blog post from a roofing company and is undated. The author is not identified.

report or appended thereto. Troubling is that the patent appended to the Amended Report references other solar shingles, several other patents (US and foreign) for solar shingles, and two publications that predate the Appellant's taxation year under appeal. The so-called research paper refers to solar shingles that may be purchased, specifically identifying Dow Powerhouse Solar Shingles as efficient and having received multiple safety certifications when announced in 2011. It also refers to an article in Scientific American on the subject. Yet there is no suggestion that any of this material was considered or reviewed by the expert.

[19] An expert has an overriding duty to assist the Court impartially. They must be independent and not be an advocate for a party.[14] In large part, the Amended Report consists of statements of CRA's positions of what constitutes an element of SRED[15] and assertions that the particular element is satisfied by the Appellant. In my view, it is in the nature of advocacy.

[20] Accordingly, I decided the Amended Report did not meet the Expert Report Requirements and dismissed the Appellant's motion to file the Amended Report.

[21] The Respondent asserted that Report 1, though timely filed, similarly did not comply with Rule 145. I agree. It suffers from all of the deficiencies of the Amended Report. Most notably it is an advocacy piece citing, quoting and applying jurisprudence and criticizing the CRA's conclusions about the Appellant's project with general statements unsupported by facts and assumptions.[16] It expresses the opinion that the Appellant's asserted technical challenge and technical uncertainty were valid according to the Act. This appears to be an opinion of domestic law, which is not the proper subject of an expert report. The documents the expert reviewed as described in Report 1 consist only of the Appellant's documents, correspondence between the CRA and the Appellant or persons acting for the Appellant, answers to written discovery questions of the Appellant's nominee, and the US patent referred to above. Report 1 does not refer to any other materials reviewed by the expert, including the scientific literature mentioned, though not

[14] See sections 1 and 2 of the Code.

[15] For example, it quotes the CRA's definitions of technological uncertainty and system uncertainty and then states why the Appellant's work met those definitions.

[16] The only stated assumption is that the Appellant did the work described in the Appellant's T661. Surprisingly then, this assumption is not repeated in the Amended Report.

described, in the Amended Report. Accordingly, I determined that Report 1 was not admissible and the evidence of the Appellant's expert would not be admissible.

B. **The Second Motion to File the Revised Amended Expert Report**

[22] On January 24, 2020, following the testimony of the first witness on December 12, 2019, but prior to the continuation of the appeal scheduled for February 26, 2020, the Appellant filed another motion, seeking the Court's permission to file a Revised Amended Expert Report ("Report 2"). The motion suggested there was no prejudice to the Respondent and the changes to the expert report reflected in Report 2 corrected errors and clarified the expert's opinion. The Appellant conceded that Report 2 was not timely filed but asked the Court to exercise its discretion to waive compliance with the time lines, as it is empowered to do by Rule 9. In the Appellant's view, it was in the interests of justice that the Appellant be entitled to file Report 2.

[23] It is well established that the Court has discretion to waive compliance with or amend time limits. Whether the Court will do so in a particular case is to be determined based on the four factors outlined in *Canada (Attorney General)* v. *Hennelly*:[17]

> The Appellant had a continuing intention to pursue the application.
>
> The application has some merit.
>
> There is no prejudice to the Respondent arising from the delay.
>
> There is a reasonable explanation for the delay.

[24] As the party who seeks a change to the time limits, the burden of satisfying those tests rests with the Appellant.

[25] The Respondent contends that the Appellant has not met three of the four tests established by *Hennelly*, conceding that the Appellant had a continuing intention to submit an expert report. The Appellant argues that the overriding consideration is whether it is in the interests of justice to allow the motion.

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[17] 1999 Carswell 967 (FCA), at para. 3.

[26] I dismissed the Appellant's application to file Report 2. In ruling against the Appellant:

1. I agreed with Respondent's counsel that the application to extend the time had no merit because, like Report 1 and the Amended Report, Report 2 does not meet the Expert Report Requirements. Again, it is an opinion whether the project constitutes SRED which is not the role of an expert. Report 2 does not distinguish between facts and assumptions. For example, it contains what are described as facts relevant to the expert's opinion on whether there was technological uncertainty. The following page or so of text contains some statements that might be described as facts, but mostly appear to be assumptions or opinions. Many so-called facts are qualified with "to my knowledge" or "to my personal knowledge." The expert's other opinions do not have any facts or assumptions associated with them.

   Report 2 contains several opinions that are supported by reference to statements the Appellant itself made or to CRA materials. Reasons for opinions are not explained. For example, Report 2 states the expert worked with the patent holder of the appended patent and expresses the view that that the patented product does not meet the Appellant's economic viability test. While the relevance of this opinion is unclear, there are no facts and assumptions, and no analysis to support this opinion. Report 2 states that the work was carried out or led by trained and experienced personnel because Mr. Baird is a qualified CAN, Master ACE and has over 30 years of experience in technology. Yet Mr. Baird's qualifications relate to computer software and hardware. There is no analysis or explanation as to how these qualifications are relevant or make Mr. Baird the appropriate person to lead the project and to develop a solar shingle. Moreover, the Appellant claims three other people were engaged in the project and the expert does not even mention them in Report 2.

   Report 2 purports to make factual findings. For example, it states that the existence of iterative design concepts, test plans and tabulate test

results sufficiently prove that development work was performed.[18] The Court, not the expert, makes factual findings and determines whether the evidence establishes the asserted fact on a balance of probabilities.

2. There was no reasonable explanation for the delay. In the affidavit in support of the application, the expert states he was unaware that he could not usurp the role of the trier of fact and he tried to prepare a report that complied with the Expert Report Requirements and that would inform the Court about his knowledge in the area. Not knowing how to prepare an expert report is not, in my view, a reasonable explanation for the delay. The Expert Report Requirements outline specific items to be addressed by an expert report. If the expert is not aware of the requirements, then it is up to counsel to explain the purpose, scope and relevant limitations to the expert.

3. The Appellant submitted any prejudice to the Respondent could be adequately addressed through costs and by giving the Respondent additional time. The Rule regarding the time by which an expert report must be filed has a specific purpose – to permit the other side to prepare its case. In this appeal, the Appellant served Report 1 within the required time. After reviewing that report, the Respondent proceeded on the basis that it would not engage an expert because the Respondent decided Report 1 did not comply with the Expert Report Requirements. If Report 1 did not comply, the Respondent concluded the Appellant's expert would be unable to testify. Respondent's counsel prepared for the hearing of the appeal on that basis. If the Court permitted Report 2 to be filed in the middle of the trial, the Respondent might wish to engage an expert and/or change its approach and trial strategy. But it may be too late. For example, Respondent's counsel has been deprived of the opportunity to ask questions of the witness (whose testimony was received before the motion was filed) that she might have considered desirable or necessary had she had Report 2, or the benefit of an expert for the Respondent, before that witness testified.[19] She also may have

[18] This is in stark contrast to the assumption in Report 1 that the work was done notwithstanding that the same documents were reviewed.

[19] I accept that the Court may recall a witness. See Rule 143(3).

chosen to not ask the questions she asked, or to have posed them in a different way. Thus, the prejudice to the Respondent goes beyond the delay and the cost of reviewing another expert report and possibly engaging an expert.

4. I do not agree that it is in the interests of justice that the Appellant be entitled to file Report 2. Upon recognizing the failure of Report 1 to meet the Expert Report Requirements, the Appellant proceeded twice to try to file what were described as amended expert reports, but which, in my view, are properly characterized as new expert reports. It would completely undermine the purpose of the rule requiring 90 days advance notice of the expert report if, following a determination that a report did not qualify with the Expert Report Requirements, a party was permitted to keep trying until its expert report complies. Yet this is exactly what the Appellant seeks to do. In my view, in this appeal, the interests of justice were best served by proceeding with the appeal.

[27] As a result of my determination that there was no admissible expert report, the evidence of the Appellant's expert witness was not received by the Court.

III. **BACKGROUND FACTS**

A. **The Appellant**

[28] The Appellant is an information technology services company that develops microcomputers, including for the fast food restaurant business (its original business), provides IT services (including computer hardware and software sales, network administration, and development of software and computer systems[20]), and provides internet services across Canada (i.e., is an internet service provider (ISP)). In the 2013 taxation year the Appellant had nine employees.

[29] Robert Baird is the President and CEO of the Appellant. In the early 80s, Mr. Baird started working in technology, initially as an employee of Pizza Pizza but then on his own as a sole proprietor, before incorporating the Appellant in 1986. Initially the Appellant's business was microcomputers but it expanded its offerings over the

[20] Examples Mr. Baird gave include parts of the transponder for the 407 Highway, power station monitoring systems, and a network interface for ticket kiosks at movie theatres.

first decade of operation to include the other computer technology services it provides today.

[30] The Appellant is not in the power business or the solar panel business. So how did the Appellant decide to pursue the development of a solar shingle?

B. **Background to the Solar Shingle Project**

[31] Silfab S.r.l. ("Silfab") is an Italy-based solar panel manufacturer that decided to establish a manufacturing plant in Canada. Mr. Baird explained that the Appellant was engaged by Silfab to work with it in an IT capacity, to develop Silfab's IT infrastructure for its Canadian manufacturing plant. The Appellant's work commenced when the Silfab building in Canada was empty and carried on until Silfab produced its first solar panel in Canada. Mr. Baird said that the Appellant continues to provide IT services to Silfab. Silfab produces solar panels for utility power generation at that plant.

[32] Mr. Baird said that it was through the IT work with Silfab that he learned a lot about the design and production of solar panels, "basically how they work and what they are used for".[21] Mr. Baird explained that a typical solar panel has a glass front and a polycarbonate backing layer which is protective and acts as an insulator. A series of solar cells[22] are "bussed" together in the center of those two external surfaces to produce the desired power output, with an EBA layer (a substance that acts as a glue as Mr. Baird described it) on the inside of the glass and polycarbonate layers.[23] Those five layers[24] are framed in metal to provide rigidity (support) and a means of mounting the solar panels where they are to be used. As he explained it, solar panels are typically mounted on brackets, that sometimes accommodate changing the tilt of the panel towards the sun and sometimes are fixed so the solar panels do not move.

[33] Mr. Baird explained that typical residential solar panel installations use the same solar panels as are used in commercial or utility power generation projects.

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[21] Transcript of December 12, 2019 ("Transcript of December 12"), page 28.

[22] Sometimes referred to as PVCs (i.e., photovoltaic cells).

[23] As Mr. Baird explained it, each solar cell is about 1.5 volts but the cells within a panel are strung with a wire ribbon and bussed in a series so a solar panel's output is approximately 70 volts (150 watts).

[24] Glass, EBA, solar cells, EBA and polycarbonate backing.

Mounting brackets are put on the residential roof, on top of the shingles, so the panels are elevated approximately five inches from the surface of the roof shingles. He explained this gap allows for natural air cooling of the panels and space for power cables to be run.

[34] In Mr. Baird's view, solar panels on residential roofs are ugly. It is very easy to identify when a homeowner has installed solar panels. Moreover, because of their size and shape, often solar panels cannot be installed on large portions of a roof, particularly if the roof has gables. These observations led the Appellant to pursue the dual purpose solar shingle. The objective was to produce a reliable solar shingle with a power output similar to conventional solar panels (based on area covered) and within the same cost constraints, but that could replace shingles. In other words, the solar shingle would be mounted on the roof and would both produce power and act as the cladding so no shingles would be necessary.[25] The idea is that a roof covered with solar shingles would appear as a conventional roof from the street (albeit glass). I refer to this as the Solar Shingle Project.

C. **Experience of People involved in the Solar Shingle Project**

[35] Mr. Baird said that he and three other employees of the Appellant were involved in the Solar Shingle Project.

[36] Mr. Baird describes himself as a computer engineer. He holds certifications from several manufacturers of computer hardware and software systems but these are vendor or product specific qualifications. Following secondary school, Mr. Baird commenced training as a pilot but was unable to complete the program because of health issues. Other than this limited pilot training, Mr. Baird has not taken any programs or courses at college or university. With the exception of some high school courses completed as part of what he described as the technical track,[26] Mr. Baird has not taken any courses or training in engineering (including mechanical or electrical engineering). Mr. Baird did not explain what it was about his experience working on the IT installation project that gave him the requisite knowledge.

[37] Two of the other three individuals Mr. Baird described as involved in the Solar Shingle Project are IT technicians. The third is a sales consultant. Their biographies

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[25] Mr. Baird said he anticipated the plywood roof covering would have to be covered with tar paper.

[26] He described this as architectural engineering, electrical, electronics and automotive.

emphasize their experience in computer products, IT technical support, network administration support, IT troubleshooting and IT consulting.

[38] Each biography states that the individual gained the relevant knowledge and skills for the Solar Shingle Project through his or her work on the successful launch, implementation and ongoing support of Silfab Ontario's IT infrastructure. One IT technician's biography states the individual worked as a lab technician, prototype design consultant and technical writer on the Solar Shingle Project. The biographies for the other two include a statement that the individual gained an extensive knowledge of solar production systems, data collection and lab assist skills.

[39] Mr. Baird confirmed that the individual who worked primarily in technical sales did not have any education in engineering. As to the two technicians, Mr. Baird said he did not know whether they had any training in engineering because that was not relevant for the position for which the Appellant hired them. Their principal role with the Appellant is providing technical support in the Appellant's information technology services business. Their biographies do not mention any other experience or training relevant to the Solar Shingle Project.

[40] The Appellant's position is that through their work on an IT installation for Silfab, a solar panel manufacturer, these three individuals, like Mr. Baird, acquired the necessary solar panel production, data collection, research and technician skills to work on the Solar Shingle Project. However, it is not clear how they would have gained that knowledge through IT installation work. Mr. Baird did not mention any data collection, research or similar work being conducted at the Silfab manufacturing plant. None of these three individuals testified. The statements in the biographies are self-serving and can be given no weight.

[41] The only witness other than Mr. Baird was Amit Saini. Mr. Saini is the founder of National R&D Inc. ("National"). National was engaged by the Appellant to assist with its SRED filings and claims. National also assisted the Appellant in responding to CRA questions regarding the Solar Shingle Project in the context of CRA's review of the Appellant's SRED claim. Although I permitted Mr. Saini to testify, under objection from the Respondent, I have determined that his evidence is largely irrelevant to the issue before me.

[42] Mr. Saini was not an employee of the Appellant. He did not participate in the design of the solar shingle or the testing process. He said that he visited the Appellant every six months, although he had many conversations with Mr. Baird over the life of the Solar Shingle Project. He said that in December 2012 he met with Mr. Baird

to discuss the Solar Shingle Project and together he and Mr. Baird reviewed some research. Mr. Saini described this process as him finding something through internet searches and asking Mr. Baird to explain why the Solar Shingle Project was different. In my view, this sounds like Mr. Saini undertaking his own due diligence in his capacity as SRED consultant assisting the Appellant in planning for and making a SRED claim.[27]

[43] The Appellant submitted that Mr. Saini was a participant expert[28] but I do not agree. While I do not dispute that Mr. Saini has significant experience and perhaps expertise assisting with SRED claims and disputes, the issue before me is whether the Appellant's Solar Shingle Project qualifies as SRED. Mr. Saini was not engaged by the Appellant to assist with the design, testing, analysis of test results or research. Mr. Saini did not participate in the activities the Appellant undertook that are the subject of this appeal.[29] While Mr. Saini testified he sent emails to Mr. Baird suggesting ideas, none of those emails are in evidence. Mr. Baird did not testify that he discussed challenges in the project and ideas for addressing them with Mr. Saini or describe any emails he received from Mr. Saini that are relevant to solar shingle design or solving problems. Mr. Saini is not a participant expert. Mr. Saini's involvement was, in my view, too peripheral to the work the Appellant claims to have done in the course of the Solar Shingle Project to be meaningful to the issue before me.

[44] It is obvious that the testimony of the other three individuals who Mr. Baird said directly participated in the testing and analysis would have been far more relevant and informative. [30] Unfortunately, the Appellant chose not to call them as witnesses.

D. **The Solar Shingle in the Appellant's 2013 Taxation Year**

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[27] As Mr. Saini explained it, National's business is focussed on assisting businesses identify potential SRED projects and assisting them with filing the claims. National is remunerated on a contingency basis, earning a percentage of the successful claim.

[28] See *Kaul* v. *The Queen* 2017 TCC 55.

[29] *Ibid.*, at para. 55. In my view, Mr. Saini is not in a comparable position to the appraiser in *Kaul* or the physician in *Attia* v. *The Queen* 2014 TCC 46.

[30] The Appellant's SRED claim suggests the other three individuals spent an aggregate of 1280 hours on the Solar Shingle Project, while Mr. Baird spent 615 hours, over the course of the 2013 taxation year. One of them is alleged to have spent 666 hours, more time than Mr. Baird. Clearly the evidence of at least some of these individuals would have been desirable.

[45] Mr. Baird's testimony suggested the Appellant's goal in developing a solar shingle was to replace utility grade solar panels currently used in residential applications with a solar shingle that looks like a conventional roof. His motivation appears to have been largely driven by the aesthetics of solar panels:

> . . . our main thing is we felt that how this looks on your house, it was very ugly and undesirable, because everyone would know that you had solar cells on your roof because of the way they are mounted.[31]

> I wanted to take these purposed utility-grade panels off the roofs of homes and replace it with a solar panel that looks just like a conventional roof, so that when you looked at it from the street . . . you may not be able to tell it's a solar roof . . . We wanted to do it so that they didn't have this big bulky ugly thing on their roof."[32]

[46] Mr. Baird said that the Solar Shingle Project started in 2011. As I understood Mr. Baird's testimony, in the earlier taxation years, the Appellant was exploring different ways to fabricate a solar shingle – using PVC film, rather than glass. He explained this provided the shingles with flexibility, like asphalt shingles, but did not produce power efficiently[33] and was too expensive to be viable.

[47] Mr. Baird claimed that the CRA accepted the Appellant's SRED claim in the 2011 and 2012 taxation years, but not 2013 taxation year. The only question before me is whether the Appellant's activities in its 2013 taxation year qualify as SRED. The fact that the CRA did not dispute a claim in 2011 or 2012 is not relevant to whether the Appellant's activities in those years, or in the 2013 taxation year, constitute SRED.

[48] When asked to describe the solar shingle at the commencement of the 2013 taxation year, Mr. Baird described a standard utility grade solar panel with two differences – it was a smaller size (67 cm by 17 cm[34]) and did not have a metal (or

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[31] Transcript of December 12, pages 30-31.

[32] Transcript of December 12, page 34.

[33] Mr. Baird asserted the efficiency would be 25-50% of that for solid PVC cells. Transcript of December 12, page 44.

[34] Approximately 26 inches by 7 inches. Mr. Baird said a typical solar panel has dimensions of approximately 4 feet by 3 feet.

other) frame.[35] Mr. Baird said in the 2013 taxation year the Appellant conducted thermal performance, stress (uniform load), and wind resistance tests on the Appellant's solar shingle. It is this work, together with some design change work he described, that the Appellant claims constitutes SRED.

(a) ***Thermal Performance Test:***

[49] Mr. Baird said because the cells in solar panels are designed to absorb solar energy, solar panels may get very hot. Accordingly, solar panels are mounted above the roof so that the air flow under the panels provides natural cooling. A cooler solar panel will produce more power than a hot or extremely hot one. And, he was not aware of any thermal risks with standard solar panels because they are mounted above the roof so natural air cooling occurs.

[50] Mr. Baird explained the power output of the Appellant's solar shingle under ideal conditions was known because the Appellant had data sheets for the solar cells used in the its shingle. Mr. Baird said the ideal power output for the shingle was 15.1219 watts.[36] As he explained it, the purpose of the thermal performance test was to determine the effect on that power output of mounting the solar shingle directly on the roof. In particular, the question was whether the power output would be affected by the heat.

(b) ***Stress (Uniform Load) Test:***

[51] Mr. Baird said that the purpose of the stress (uniform load) test was to determine the effects of snow (weight) on the Appellant's solar shingle.

(c) ***Wind Resistance Test:***

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[35] Its smaller size also means it had fewer solar cells, although Mr. Baird never described the number of solar cells in the Appellant's prototype.

[36] He also said they tested the solar shingles under ideal conditions by bringing them outside. The data sheets were not provided to the Court in documentary form. At approximately 15 watts, the shingle would produce approximately 6% to 10% of the wattage produced by a standard solar panel, depending on whether Mr. Baird's 150 watt or 250 watt testimony for a standard solar panel is correct. See notes 23, 97 and 98.

[52] Mr. Baird said the purpose of the wind resistance test was to determine the effects of wind on the Appellant's solar shingle.

(d) ***Other work:***

[53] In addition to the three categories of tests, Mr. Baird testified that the Appellant also made some design modifications to the solar shingle in the 2013 taxation year. This included a new lattice support, changes to the mounting system and the electrical connection system and increasing the size of the solar shingle.

IV. **THE LAW**

[54] The Appellant bears the burden of demonstrating, on a balance of probabilities, that the activities it undertook with respect to the Solar Shingle Project during the 2013 taxation year constitute SRED.

[55] SRED is defined in subsection 248(1) of the Act but, for purposes of this appeal, the relevant portion reads as follows:

> **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
>
> . . .
>
> **(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, . . .

[56] SRED envisages a new or improved product or process, involving something more than the application of routine engineering principles. Creativity must be employed. Although the SRED need not result in a new or improved product or process, the objective of the research must be realistic and there must be meaningful technological advancement.[37]

[57] The Federal Court of Appeal has identified five criteria relevant to determining whether a particular activity constitutes SRED:

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[37] *RIS-Christie,* at para 13.

1. Was there a technological risk or uncertainty which could not be removed by routine engineering or standard procedures?

2. Did the person claiming to be doing SRED formulate hypotheses specifically aimed at reducing or eliminating that 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 the results kept as the work progressed?[38]

[58] Counsel for the Appellant submits that these are criteria rather than tests, pointing out that they are not specified in the Act or Regulations. Nonetheless, it is well established that these criteria are relevant in assessing whether a particular activity constitutes SRED.[39] The failure to satisfy a particular criterion may not be fatal to a determination that an activity qualifies as SRED.[40] However, it is clear there must be a technological risk or uncertainty,[41] the research efforts must be systematic,[42] and the process must result in technological advancement.[43] As observed in *Northwest Hydraulic*, some doubt as to the best way to resolve technical issues does not amount to the existence of technological uncertainty.[44]

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[38] See *C. W. Agencies Inc*. v. *R.* 2001 FCA 393 at para 17, citing *RIS-Christie* at p. 5089. See also *Northwest Hydraulic Consultants Ltd*. v. *R.* 1998 CarswellNat 696 (TCC) [*Northwest Hydraulics*]; *Jentel Manufacturing Ltd*. v. *The Queen* 2011 FCA 355 [*Jentel*], and *Kam-Press Metal Products Ltd.* v. *Canada* 2021 FCA 88, aff'g 2019 TCC 246 [*Kam-Press*].

[39] *Jentel* at para. 6; See also *R & D Pro-Innovation Inc.* v. *Canada* 2016 FCA 152; *National R & D Inc.* v. *The Queen* 2020 TCC 47; *Indusol Industrial Control Ltd.* v. *The Queen* 2020 TCC 103; *Joel Theatrical Rigging Contractors (1980) Ltd.* v. *The Queen* 2017 TCC 6; *Dock Edge + Inc.* v. *The Queen* 2019 TCC 11; and *Kam-Press*.

[40] See *Life Choice Ltd.* v. *The Queen* 2017 TCC 21, at para. 51.

[41] *Jentel*, at para. 6.

[42] This requirement is found in the definition of SRED. Moreover, see *RIS-Christie* at para 14.

[43] This requirement is found in the definition of SRED.

[44] *Northwest Hydraulics*, at para. 31. See also Tax Court of Canada decision in *Kam-Press*.

[59] Technological uncertainty is an uncertainty that cannot be resolved by routine engineering or standard procedures. If the identified problem may be resolved using knowledge, techniques, procedures and data that are generally accessible to competent professionals in the field,[45] there is no technological uncertainty.

[60] Technological advancement is an advancement in general understanding.

[61] The second, third and fifth criteria identified by the Federal Court of Appeal as relevant to identifying SRED, are connected to the experiments and the testing: the formulation of a hypothesis designed to address the technological uncertainty; the procedures undertaken in the experimenting/testing process; and detailed contemporaneous records of the hypotheses, tests and results.

[62] Formulation of a hypothesis involves identifying the problem (technological uncertainty) to be solved, formulating a hypothesis for reducing or eliminating that uncertainty, and methodically and systematically testing that hypothesis.

[63] Testing should accord with the principles of the scientific method: trained and systematic observation, measurement and experiment and the formulation, testing and modification of the hypothesis.[46]

[64] While I agree with the Appellant that neither the Act nor the Regulations expressly requires a detailed record of the hypotheses, tests and results be maintained as the testing or experiments are undertaken, the need to do so is implicit in the requirement that the research be carried out in a systematic way by means of experiment or analysis.[47] The desirability of such evidence is obvious. It is important not only to substantiate that the work was done, but also so that the information and resulting analysis can be revisited and reanalyzed if necessary as the project progresses and hypotheses are modified.

V. **ANALYSIS**

A. **What was the Appellant's technological uncertainty?**

[45] *Northwest Hydraulic*, at para. 16.

[46] *Northwest Hydraulic*, at para. 16.

[47] *Northwest Hydraulic*, at para 16.

[65] In reassessing the Appellant, the Respondent assumed that there was no technological uncertainty in the Solar Shingle Project.

[66] At the outset, I observe that the Appellant embarked on a project to develop a new product – a dual purpose solar shingle. But what was the technological uncertainty? Mr. Baird described the uncertainty as whether the Appellant could develop a solar shingle that would work with all the components to suit the intended project objective. That objective was to create "a dual purpose, reliable, replicable solar shingle that would produce the same performance as conventional [solar] panels, as well as allowing the same cost".[48] Mr. Baird said the uncertainty was whether the Appellant could achieve that goal. I agree with counsel for the Respondent that this is more in the nature of a design objective, than a statement of technological uncertainty.

[67] Appellant's counsel asked Mr. Baird to describe the uncertainties the Appellant faced. Mr. Baird suggested the following:

> Whether the solar shingles could be placed directly on the roof in place of shingles?
>
> The durability of the solar shingle, i.e., would a smaller solar panel without a frame break because it had less rigidity and would moisture leak into the edge?
>
> How would the power be "bussed out" of the shingles because smaller panels (i.e., shingles) required more panels to cover the same area as traditional solar panels requiring more connectors?
>
> Whether the smaller panels (shingles) could achieve a target power yield of 250 watts per square meter given greater (non-productive) space needed to connect them together?
>
> Whether the solar shingle could be scaled up in size and achieve the same results?

(i) What was the knowledge in the industry at the time?

[68] Knowledge or experience in the solar power industry with respect to solar shingles is relevant to determining whether there was a technological uncertainty. If knowledgeable competent professionals in the field would state that the uncertainties

[48] Transcript of December 12, pages 119-120.

identified by Mr. Baird were not uncertain, then there is no technological uncertainty.

[69] The Appellant's business is not solar power. The Appellant was not seeking to solve a problem it or its clients had encountered in its field of operation – computer technology. The Solar Shingle Project was not complementary to the Appellant's business. While there is no requirement that activities be tied or connected to a taxpayer's business to qualify as SRED, the persons involved in the activity need the requisite relevant experience or knowledge in the area to be able to identify whether there is a technological uncertainty. Technological uncertainty does not arise simply because the Appellant does not have the requisite knowledge. The question is whether the uncertainty identified by the Appellant is an uncertainty to those knowledgeable and experienced in the relevant field.

[70] The evidence does not persuade me that Mr. Baird and the other three individuals involved in the Solar Shingle Project are knowledgeable and competent in the field of solar power or solar panel manufacturing and design. Moreover, I am not persuaded that the Appellant undertook sufficient research to conclude that the Appellant's identified technological uncertainties would have been considered uncertain to people in the field.

[71] Mr. Baird said he was the only person who conducted due diligence concerning solar shingles and he was unable to find any public knowledge that would answer the questions the Appellant had. Thus, he said, the testing was necessary.[49] In essence, his testimony was no one had a solar shingle like the one the Appellant was developing and so there was no public information available that would answer the Appellant's questions. With respect, that is not the correct way to approach the issue. The question is whether, presented with the Appellant's solar shingle prototype, persons knowledgeable and competent in the field would face the uncertainties that Mr. Baird claims the Appellant faced, or would they know how to solve them.

[72] But what research did the Appellant undertake? Mr. Baird said that he did internet research and spoke to the production manager at Silfab who told him that Silfab had no plans for solar shingles. Mr. Baird did not produce the research he said he conducted, and could not identify search terms he used, and or a list of documents

[49] Transcript of December 12, at page 160.

or websites he viewed. Mr. Baird did not speak to any other solar panel manufacturers.

[73] Other than Mr. Baird's testimony, the only evidence of research the Appellant produced is a one page summary, prepared by Mr. Baird, titled "Solar Shingles research" dated December 8, 2012 (the "Research Summary").[50] However, it does little more than make general statements comparing solar panels and shingles (e.g., solar shingles are more beautiful, solar shingles cannot be easily moved to another house but solar panels can be easily moved, and solar shingles are not suitable unless the roof faces the sun but solar panels are more flexible). In cross-examination Mr. Baird acknowledged some of the statements were personal opinion and some were based on knowledge he had, rather than research. The Research Summary does not refer to any websites, articles, or cite any other sources of information.

[74] What is particularly troubling is that the Research Summary suggests solar shingles did exist.[51] Mr. Baird also described seeing Tesla advertisements for solar shingles. He said he did not believe they were available for purchase at the time,[52] but rather were in development, expressing the view that the advertisements were intended to create demand in advance of the shingles actually being available. Mr. Baird also suggested the picture in the Tesla advertisement implied a flexible solar shingle that, he said, is not as efficient as solid solar cells. He said when the Appellant commenced the Solar Shingle Project in 2011, there was no viable commercial product, though some enterprises were talking about it.[53]

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[50] The Appellant also produced a few emails seeking glass and other parts for the solar shingle but they do not reflect relevant research because they only seek material for the shingles.

[51] The Research Summary includes the following statements:

> Solar shingles are more expensive to buy and install than solar panels. The reason is that they are not produced in large volumes. In fact it's very difficult to procure Solar Shingles.
>
> Solar shingles due to low volume and its niche use is [more] costly to buy and install than silicon solar panels. Solar shingles are 12-63 watts and they can cost almost $6-7/watt to install, though these rates may vary significantly across installers. Note you need a roofing or solar EPC contractor to get the solar shingle installation done. You will generally get a quote on the whole system installation and not on buying individual solar shingles. This will cost you almost 1.5 X times the cost of installing solar panels.

[52] Mr. Baird said Tesla started selling a solar shingle commercially a few years before the appeal was heard, though he claimed they faced some thermal (overheating) issues.

[53] Transcript of December 12, page 42. He also said that in 2011 testing was occurring in the market. Transcript of December 12, pages 120-121.

[75] However, Mr. Baird acknowledged he did not contact Tesla or look at any online engineering forums to see what might have been developed or have been under development by Tesla or otherwise. He did not speak with the manufacturers, suppliers or installers of the solar shingles referred to in the Research Summary, any other manufacturers of solar panels, or any other experts in the field of solar energy. The only people he said he spoke with were employees of Silfab, an enterprise that was neither manufacturing, nor interested in manufacturing, solar shingles. His description of those conversations did not suggest a particularly robust inquiry about technological issues.

[76] Unfortunately, even if I accept that Mr. Baird and his colleagues, and so the Appellant, did not know the answer to the questions Mr. Baird said they had, I have no authoritative or persuasive evidence as to the knowledge of competent professionals in the relevant field at the relevant time. I do not have the benefit of expert testimony. Without any evidence of the extent or relevance of the internet research Mr. Baird and Mr. Saini described,[54] or what documents or other information Mr. Baird reviewed, I am not convinced the Appellant had adequate information about the state of relevant knowledge in the field to assess whether there was a technological uncertainty.[55]

(ii) Closer examination of the asserted technological uncertainties

[77] Notwithstanding that the Appellant has not persuaded me that it had sufficient information to assess whether its questions could be answered by persons

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[54] As noted above, I give no weight to Mr. Saini's testimony about the research. Mr. Saini met with Mr. Baird in December 2012, halfway through the taxation year under appeal, and at least 18 months after the Solar Shingle Project commenced for what I find was an exercise to permit Mr. Saini to perform due diligence not for the Appellant, but for National in the context of its role in assisting the Appellant with SRED claims. Mr. Baird said he alone conducted the due diligence, suggesting he, like me, does not consider his meeting with Mr. Saini as part of the Appellant's research.

[55] Mr. Baird claimed no one had a solar shingle like the Appellant. However, based on his description of the Appellant's research, I am not confident that he could identify the differences between the Appellant's solar shingles and the ones referenced in the Research Summary or whether any differences were technologically meaningful. He did not explain any differences between the Appellant's solar shingle and those otherwise available. I have not even been convinced Mr. Baird looked at other available shingles in other than a somewhat superficial way. Moreover, what is relevant is the knowledge of persons competent in the field, faced with a design difference, not the mere fact there is a design difference.

knowledgeable in the field, I will review the asserted technological uncertainties individually.

[78] The first uncertainty Mr. Baird identified was whether the solar shingles could be mounted directly on the roof surface.

[79] In testimony, Mr. Baird said he knew that the solar shingles would get hot (because they are designed to absorb solar energy) and that hotter solar panels are less efficient. He explained that one of the reasons solar panels are mounted above the roof is so that air can flow underneath to naturally cool the solar panel. In other words, Mr. Baird knew that a means for keeping the solar shingles cool was essential.

[80] Mr. Baird said that when the solar shingles were placed directly on plywood, they became too hot and did not perform. Based on his testimony, this appears to have been an expected result with a known solution, rather than an uncertainty.

[81] However, if it was a technological uncertainty, the solutions the Appellant used to try to resolve that uncertainty in the 2013 taxation year appear to be in the nature of routine engineering or the application of available knowledge, including Mr. Baird's own knowledge. Moreover, the solution to the uncertainty the Appellant identified is the very solution used to cool solar panels – a gap between the solar shingle and the roof surface to allow air flow.

[82] Mr. Baird described three approaches the Appellant tried to address heat dissipation from the solar shingle (rubber backing, aluminum mesh in the rubber backing, and introduction of an air gap).[56]

[83] The rubber backing did not dissipate the heat from the shingle. Therefore, the Appellant tried adding aluminum meshing to dissipate the heat to the mounting system which would then act as a heat sink. Based on Mr. Baird's own testimony, a heat sink is a known technique for drawing away heat.[57] Because the results were

[56] For reasons described below, I am not satisfied the rubber backing test was completed in the 2013 taxation year.

[57] Mr. Baird said heat sinks are typically used to draw heat away from something. He gave an example of the heat sink in a laptop computer.

unsatisfactory,[58] the Appellant decided to add an air gap between the solar shingle and the roof surface.

[84] Mr. Baird said the reason solar panels are raised from a roof's surface is to allow air flow under the panel for natural cooling because if the solar cells become too hot there is an adverse effect on performance. Solar shingles without an air gap were too hot to efficiently produce power, so the Appellant added a gap. The tests indicated the minimum gap necessary was 25 mm.[59]

[85] The Appellant has not convinced me that adding an air gap was anything other than applying known techniques including a technique known to work both by the solar panel industry and Mr. Baird.[60]

[86] As to the durability uncertainty, Mr. Baird said that once the shingles were raised off the roof surface to permit cooling by air flow, the Appellant had a new problem because nothing was supporting the centre of the shingles.[61] As Mr. Baird explained it, the Appellant was taking the highly-tested utility grade panels and changing the design. Consequently, the Appellant was uncertain whether without the frame, and the rigidity it provided, the shingle would crack or break or whether moisture would get into the edge. This led the Appellant to consider the effect of snow on performance of the solar shingle.

[87] Other than asserting this was an uncertainty, the Appellant provided no evidence that it was. Put another way, presumably solar panels installed on roofs are also exposed to snow loads. Yet Mr. Baird did not explain whether snow was a problem with solar panels. If snow is a problem with solar panels, how is it addressed and why would that solution not apply to the Appellant's solar shingle? If it is not a problem, what about the Appellant's solar shingle suggested snow would be a problem? In fact, Mr. Baird seemed to recognize that raising the (unframed) solar shingle off the roof would give rise to a need for some kind of support. So, in

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[58] Mr. Baird's testimony about the aluminum mesh was inconsistent with the Appellant's documents. See note 96 and related text.

[59] I observe only a single solar shingle was tested at a time. Presumably the 25 mm gap may not have been representative of the air gap needed to adequately cool solar shingles over a roof's area.

[60] As noted above, the Research Summary indicated that, although not common and expensive, solar shingles existed in the relevant period. Yet Mr. Baird did not mention what approaches to heat dissipation were used for those solar shingles.

[61] Transcript of December 12, page 61.

identifying what he says is the uncertainty (i.e., whether the shingle could bear the weight without a frame to provide support and rigidity), Mr. Baird appears to have also identified the solution – the shingle needed support.

[88] Mr. Baird said that once weight was added to the solar shingle, they observed deflection (i.e., the shingle bowed). At a 25mm gap, the deflection was more than 12 mm. This was a problem, he said, because it could lead to water damming underneath the shingles.[62] This he said led the Appellant to determine that the shingle needed support.

[89] While I have no evidence that deflection was uncertain with the addition of weight to the shingle, adding support to counteract the deflection appears to be the application of routine engineering. Mr. Baird said that utility grade solar panels have support, including a frame to provide rigidity. He was concerned because the shingle did not.

[90] Similarly, Mr. Baird said the wind resistance test was to determine the effect of wind on the solar shingles. Again, solar panels installed on roofs are also exposed to wind. Yet Mr. Baird did not explain whether wind was a problem with solar panels, or if it is, how it is addressed and why that solution would not apply to the solar shingle. I have no evidence as to whether wind was a problem for solar shingles that are referred to in the Research Summary, or if not why. Indeed, Mr. Baird did not suggest that wind damage to the Appellant's solar shingle was unexpected[63] once the solar shingle was raised off the roof surface.

[91] Mr. Baird said that under the wind resistance test they observed that the solar shingle oscillated or vibrated between mounting points and this affected performance. In particular, they observed permanent damage in the solar cells at a 20mm gap between the shingle and surface under a 25km/hr wind, such that the test shingle failed. With a replacement shingle, damage started with 15 km/hr wind, was significant with a 25 km/hr wind and the glass cracked with a wind of 40 km/hr. This was a significant problem because winds often exceed 40 km/hr.

[92] Mr. Baird explained that while rigidity for support and air flow for cooling were necessary, the wind test results led the Appellant to redesign the support for

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[62] Transcript of December 12, pages 63-64. He later said bowing could lead to microfractures in the solar cells inside the shingle (permanently negatively affecting performance). Transcript of December 12, page 124.

[63] Mr. Baird stated he assumed the stronger the wind the more trouble that would be experienced.

the shingle to eliminate vibration. The Appellant incorporated two lateral support panels to the back of the shingle with a lattice design so that air could continue to flow through, while augmenting support.[64]

[93] Even if the effects of wind were uncertain, the solution pursued and adopted appears to be the application of available knowledge and routine engineering techniques. Thus, I am not convinced this constituted a technological uncertainty.

[94] Mr. Baird suggested that, with the new lattice support system, the thermal issues, load issues and wind issues were solved, leading the Appellant to explore scaling up the shingle in size.

[95] The Appellant explored creating a bigger panel to get more power output per square metre. Mr. Baird described the larger panel as 1648 mm by 990 mm,[65] a comparable size to the utility grade panels and many multiples in size of the 67 cm by 17 cm prototype.[66] This by itself is surprising since Mr. Baird said one problem with the utility grade solar panels the Appellant was seeking to solve was the limitations their large size had on where they could be installed.[67] The larger size also is entirely inconsistent with the Appellant's stated objective of creating a solar shingle that appears like a roof with asphalt shingles.[68]

[96] As to the remaining three uncertainties, Mr. Baird described developing an electrical box in the mounting system to connect to the wiring and convey the power back to the inverters to convert the power to AC power. He said when they used this approach with larger panels, they discovered difficulties in electrical connectivity, and in particular arcing, which he said was unexpected. This led the Appellant to change to cabling and connectors, instead of electrodes, integrated into the mounting

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[64] The Appellant submitted a computer generated (CAD) drawing of the solar shingle dated May 9, 2013 called "Cross Section Vertical Support Lattice." However, this drawing does not show the detail of the lattice support design. No other documents relevant to any redesigns were in evidence.

[65] More than 5 feet by more than 3 feet.

[66] Mr. Baird described a utility grade solar panel as 4 feet by 3 feet. See Transcript of December 12, page 30.

[67] Nothing in his testimony on this aspect of the work suggests that what Mr. Baird meant was testing an aggregation of smaller shingles that together covered a larger area.

[68] Mr. Baird described the solar shingles overlapping each other slightly like conventional shingles. It is hard to imagine this with shingles that are 5 feet wide and 3 feet tall, or that shingles of that size would satisfy the design objective Mr. Baird described.

system. The mounting system was redesigned and screws were added to the mounting system to add further stability.

[97] The only evidence of these modifications and challenges is Mr. Baird's testimony. The Appellant had no drawings, no written descriptions, no test equipment or procedure, or other relevant documentation. I am not convinced these were challenges the Appellant faced in the 2013 taxation year. However, even if they were, I have no credible evidence that any of them is unexpected or unusual or that the solutions the Appellant employed are anything other than well understood or routine techniques.[69]

[98] The Appellant has not satisfied me on a balance of probabilities that the problems Mr. Baird identified are technological uncertainties as that expression is interpreted in the context of SRED or that the approaches taken to address the problems the Appellant faced are novel or anything other than the application of known mechanical or electrical engineering principles, including solutions known to work in the solar panel industry.

(iii) Revision #1 of the thermal performance test

[99] As noted above, Mr. Baird said that the testing with rubber backing and then the aluminum mesh as means of dissipating heat occurred in the 2013 taxation year. However, for the following reasons, I have not been persuaded that the rubber backing tests were done in that taxation year.

[100] The Gantt chart submitted to the CRA in 2015, following CRA's request for contemporaneous planning documentation for the tests, suggests that testing with the rubber backing and aluminum mesh was completed in July 2012.[70] Meeting minutes[71] indicate that the heat dissipation issues from the rubber backing were

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[69] Mr. Baird testified the connector used with the larger panel was one commonly used in the solar industry. Transcript of December 12, pages 88-89.

[70] The Gantt chart distinguishes between planned and actual tasks. The rubber backing and aluminum mesh tests are indicated as actually occurring in July, 2012 with analysis of results completed by the end of July.

[71] The Appellant provided agenda and meeting minutes for business development meetings and for technical meetings. However, even these documents are incomplete. For August 7, 2012, October 23, 2012, November 27, 2012, and April 9, 2013 business development meetings, the only evidence is an agenda. For the meeting on September 25, 2012 either pages are missing or the relevant portions of the minutes are redacted. There are large gaps of time when no minutes are available (e.g. November 28, 2012 – January 29, 2013 and January 30, 2013 to April 9, 2013).

discussed, and a decision to add aluminum mesh was made on July 10, 2012. These are from early in the 2013 taxation year, and may be from the first meeting of the year. No minutes from any earlier meetings were introduced.

[101] Mr. Baird's "Summary of testing, modifications and results" (the "Testing Summary") states "End of last fiscal year we experienced heat dissipation issues with the rubber support backing material" suggesting the rubber backing was tested at the end of the 2012 taxation year, not in the 2013 taxation year. The July 10, 2012 minutes are not inconsistent with this statement, since the testing could have been completed in the 2012 taxation year, but the results not discussed until this first meeting of the 2013 taxation year.

[102] Three schematics for the thermal performance test were provided to the Court. Revision 1 (rubber backing) is dated August 21, 2012,[72] Revision 1.1 (aluminum mesh) September 10, 2012, and Revision 2.0 (air gap) September 27, 2012. This would suggest none of the thermal performance tests were performed until late August, 2012.[73]

[103] Finally, the Appellant did not provide any test results for the rubber backing version of the thermal performance test.

[104] The scant evidence on the rubber backing version of the thermal performance test is too inconsistent to be considered reliable. The only evidence on this issue that is clearly contemporaneous is the July 10, 2012 minutes, which are ambiguous as to whether the testing was at the end of the 2012 taxation year or the beginning of the 2013 taxation year. I have not been persuaded that the rubber backing test was undertaken in the 2013 taxation year.

(iv) Conclusion on technological uncertainty

[105] The Respondent assumed there was no technological uncertainty and that the Appellant's activities were ones for which the required knowledge was in the public domain. The Appellant bore the burden of providing the Court with evidence that this assumption was incorrect. The evidence does not persuade me that the matters

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[72] Again, Mr. Baird said the schematic was not related to the rubber backing, yet the equipment for Revision 1 accompanying the schematic includes "Backing layer (Rubber 1/8 " EPDM61)". If this version was for something else, that was never explained.

[73] For reasons described below, I am not convinced the schematics and associated test descriptions were prepared in the 2013 taxation year.

the Appellant describes as technological uncertainties would have been characterized as such by persons knowledgeable in the field of solar energy, mechanical and electrical engineering and solar panel or solar shingle production and installation. Thus, I am not satisfied there was any technological uncertainty.

B. **Did the Appellant formulate, methodically test and observe and adapt hypotheses?**[74]

[106] For each category of tests, the Appellant provided a one page hand-drawn schematic[75] together with one or two pages describing the equipment to be used and the test procedure. Although the tests were revised,[76] the revisions (with a date) appear on the same page as the schematic for the initial test,[77] and are described in a sentence or two on the test procedure page. The only other evidence regarding the testing is Mr. Baird's testimony, meeting minutes, test results summary pages and the Testing Summary.

[107] The test description documents lack significant detail. None specifies the purpose of the test (what is the problem or technical uncertainty the test seeks to address) and none states a hypothesis. None states the observations made in, or conclusions drawn from, the prior version of a test which led to the revision. None includes an explanation about why the proposed revision might assist with solving the observed problem.

[108] There is no explanation of why the particular test equipment was selected, where measurements were to be taken,[78] why the test was set up the way it was, how many times it was to be repeated,[79] or over what period it was to be done.

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[74] Given my findings on technological uncertainty and whether there was systematic research, I need not address technological advancement.

[75] In the case of the thermal performance test, the Appellant had two diagrams, the first showing no air gap and said to be related to the rubber backing and aluminum mesh versions of that test.

[76] For example, Rev 1, Rev 1.1, Rev 2.0 and 2.1.

[77] With the exception of Revision 2 of the thermal performance test, which had its own schematic.

[78] For example temperature. Placement of the digital thermometer, volt meter, wind meter, blower (fan), amp meter, and vernier is not indicated on the schematics. See note 86.

[79] Mr. Baird said each test was done at least seven times but sometimes more, until a consistent result was achieved. Nowhere is the meaning of "a consistent result" explained. And that approach to testing is not indicated anywhere in the description of the tests. The only reference to timing is in Revision 1 of the thermal performance test which states the power output and temperature

[109] In each case, the description of the test procedure lacks precision. Let me give some examples.

[110] The list of equipment for Revision 1 and 1.1 of the thermal performance test includes volt meter, amp meter, resistor and digital thermometer. None of this equipment appears on the schematic for the test, yet the test procedure instructions state little more than: set up test as outlined in drawing; using amp, volt meters and thermometer measure power output and temperature at 15 minute intervals until the single temperature ceases to increase; report results. Nowhere does it specify how or where the measurements are to be taken. Mr. Baird testified they discovered the shingle was hottest in the centre and so they decided to measure the temperature there, but that is not specified anywhere. Revision 1.1 (aluminum mesh) states nothing more than "Re-run tests using aluminum/rubber mesh backing sheet." The details of that backing sheet are not described.

[111] Revision 2 of the thermal performance test has its own drawing, but the only difference between it and the (single) drawing for Revisions 1 and 1.1 is the gap between the solar shingle and the surface and the removal of a backing layer for the shingle. The equipment list is the same except the backing layer is replaced with spacers (plastic strips) and a vernier is added. There is no indication of the purpose of the vernier and what measurements are to be taken with it. The only measurements called for are temperature and power output, measured with a digital thermometer and amp and volt meters. Moreover, Revision 2 does not state when or how often the temperature is to be measured or when the measurements should cease.[80] The placement of the digital thermometer and volt and amp meters is not indicated.

[112] Mr. Baird said that they learned through the thermal performance test that only a minimum gap of 25 mm between the shingle and the surface provided adequate air flow for cooling. Nonetheless, he said the stress (uniform load) test was conducted using the same series of gaps between the shingle and the roof as had been used in the thermal performance test.[81] While Mr. Baird said they did so in case the advantages of mounting the shingle directly on the roof outweighed the loss in

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measurements should be taken at 15 minute intervals until the temperature ceases to increase. Revision 1.1, on the same page, states the same tests should be rerun using aluminum/rubber mesh backing sheet.

[80] Unlike Revision 1 which called for the temperature to be measured at 15 minute intervals until the temperature ceased to increase.

[81] That is, the same 0, 5, 10, 15, 20 and 25 mm gaps.

efficiency,[82] nowhere does this trade-off seem to be reflected in the documents. Again, no hypothesis, analysis or rationale is found in any of the documents.

[113] Mr. Baird said the stress (uniform load) test called for different snow loads (25 mm, 50mm, 200 mm, 300mm and 600mm) to be applied uniformly across the entire shingle. While Mr. Baird said he recognized a snow load would not necessarily be uniform across a roof, he thought a uniform load test would produce the greatest stress. Nowhere is this noted in the documents. Moreover, to conduct this test the Appellant used water because it did not have snow. Mr. Baird said he computed how many litres of water would be the equivalent of the various snowfalls to be tested.[83] Accepting, without knowing, that water is an appropriate substitute for snow, I observe that the description of the test equipment refers to weights, not water or snow. The test procedure states "using weights specified for each test measure effects on shingles at gaps of 0, 10, 15, 20 and 25 mm with vernier".

[114] But where is the nature of or mass of the weights to be used specified? How is the weight to be added? Mr. Baird said the water would be uniformly distributed on the shingle to simulate snow. But how? Unless either the shingle or the water is in a container, how was that possible? Yet none of that is shown in the diagram or described in the equipment used or test procedure.[84]

[115] What effects are to be measured and why? The equipment (vernier) suggests deflection, but that is not specified. Where is the measurement to be taken? When and how often is the measurement to be taken – immediately after the weight is added, after a period of time or at particular intervals of time? Revision 1.0 calls for

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[82] Transcript of December 12, page 62.

[83] He said the weight of snow was based on $1/10^{th}$ the density of liquid water. Thus, said Mr. Baird, to replicate 600 mm of snow they used 74.37 litres of water. The source of this information is not provided but if it is correct then the calculations cannot be correct. Consistent with Mr. Baird's testimony, the test results summary sheet states "weight of snow based on $1/10^{th}$ the density of liquid water." But, based on Mr. Baird's testimony, the Appellant was trying to determine the ***volume*** of water in litres to be used in place of snow. What was known to the Appellant is the volume of snow for which a water substitute was needed (.12395 square meters* x 600 mm), or 74.37 litres. [*This number is from the stress tests results summary page although a little different than 67 cm x 17 cm Mr. Baird gave as the size of the solar shingle.] Yet Mr. Baird said that is the volume of water the Appellant used. It is obvious that 74.37 litres of snow does not have the same weight as 74.37 liters of water, water having a far greater density.

[84] Like the thermal performance test, the schematic for the stress test suggests various revisions. Revision 1.0 is dated October 18, 2012, Revision 1.1 is dated November 16, 2012, Revision 2 is dated December 10, 2012 and Revision 2.1 is dated February 5, 2013.

spacers (plastic strips) but they are not shown on the diagram. Revisions 2.0 and 2.1 state nothing more than "repeat test with foam strips [support column in Rev. 2.1] to add support." What was the rationale that led to these choices for support? And how many foam strips, what size were they, where were they to be placed? What is the support column? Where is it to be placed?

[116] In describing the results of the stress (uniform load) test, Mr. Baird said they discovered the ideal air gap (25 mm) caused "a major dilemma on the physical structure" of the shingles because of deflection (bowing). The dilemma he described was the potential for water leaks and water damming because the shingles were designed to slightly overlap each other like conventional shingles. Again, nowhere is that dilemma noted in the documents. The Testing Summary refers to microfractures of the solar cells at a 200mm simulated load.[85] Mr. Baird testified that a fractured a solar cell will not produce power. If the cell fractured at a 200 mm simulated load, why was increasing the simulated load to 600mm considered important? What hypothesis was being tested? None of this is explained in the documents.

[117] The wind resistance test equipment list includes edge clamps and a wind meter. Neither appears in the schematic yet the procedure refers to the schematic for test set up. The test procedure provides for testing at several wind speeds, but nowhere are the wind speeds indicated. The test procedure does not specify the placement of the fan (distance from the shingle and/or centered or otherwise along the shingle edge). In testimony Mr. Baird said that the schematic for the wind resistance test was not the correct perspective.[86] If this is so, where is the set up explained? The test procedure states that effects on the shingle should be measured at the 0-25 mm gaps with the vernier.[87] The nature of the measurements is not specified, although the vernier suggests deflection. Yet Mr. Baird described the shingle as oscillating or flapping under the wind. If the shingle is oscillating and flapping, how should the measurements be taken? Over what period of time? How frequently? Moreover, why does that measurement matter? What Mr. Baird said they observed was the oscillation led to fracturing (i.e., failure) of the cell and at higher

[85] As noted above, Mr. Baird also testified about this.

[86] Transcript of December 12, page 67: ". . . it's showing the blower sort of beside the cell, but we actually blew the air through the front . . .".

[87] The comments in reference to the stress (uniform load) test about testing at these gaps while knowing that the thermal performance test indicated a minimum gap of 25 mm made would seem to apply here also.

wind speeds cracks in the glass in the shingle. But again, the documents do not reflect a hypothesis, a rationale or any analysis.

[118] Revisions to the tests described by Mr. Baird in testimony are not documented. For example, although Mr. Baird said the Appellant re-ran the wind tests (for example) after the addition of the lattice lateral support, there is only one version of the wind resistance test, which does not include the lattice support. Mr. Baird also suggested they tested wind resistance under a snow load, but again none of the documents refer to or describe this version of the test.

[119] Nowhere do the test descriptions suggest solar shingles of different sizes or different compositions were used. Yet Mr. Baird testified they changed the design[88] and size of the panel over the course of the project. Mr. Baird also described a process for determining the base power for each shingle, explaining there were some differences. Yet that detail appears nowhere in the Appellant's documents. There is no suggestion that the tests were run using different shingles, or what was learned from tests that led to design changes.

[120] Every test procedure has as its final task "Report results". Where are the results? Where is the analysis of the results of each version of the test and a discussion about why that analysis led to revisions or a new test (i.e., the new problem and the new hypothesis)? Where are the observations Mr. Baird described in testimony that were not the subject of measurement (e.g., microfracturing, flapping, oscillating, fracturing of the glass, etc.) recorded?

[121] The only other evidence provided to the Court is copies of minutes from Business Development Meetings and Technical Meetings (none of which relate exclusively to the Solar Shingle Project or contain more than a few short point-form notes on the Solar Shingle Project), the test result summary pages[89] and the Tests Summary. While the Tests Summary and the minutes contain some statements that might be characterized as summary observations, in my view, they are not of the

[88] Mr. Baird said they tried rubber backing, and aluminum mesh, but the relevant details (such as thickness, size, how attached) were not documented. He said then foam strips and then a support column were added. Again, no description of these supports is recorded. He also said the individual shingles had slightly different power output but that is not noted in the testing documents. Transcript of December 12, page 74.

[89] But not for every version of a test.

character contemplated by a scientific, systematic or methodical approach to a problem. They are point-form and far too general to be informative. [90]

[122] And, despite testimony that each test sequence was run multiple times until a consistent result was achieved, and each test had several revisions, the Appellant had only one test results summary page for each of the thermal performance test, the stress (uniform load) test and the wind resistance test.[91] This summary page contained information about averages from the tests, not details of the individual measurements.

[123] All of this is far less than I would expect had the Appellant formulated hypotheses specifically aimed at reducing or eliminating a technological uncertainty and adopted a procedure that accorded with the discipline of scientific method: trained and systematic observation, measurement and experiment, and formulation, testing and modification of the hypotheses as the project proceeded.

[124] In my view, the testimony and documents the Appellant made available to the Court do not demonstrate that the Appellant applied a scientific or systematic approach to solving the problems.

C. **Did the Appellant maintain contemporaneous records?**

[125] The Respondent assumed the Appellant did not keep sufficient records and documents in respect of the work performed. The evidence supports no other conclusion.

[126] The only records relating to testing are the schematics, the Testing Summary, the one page test results summaries for select tests the Appellant claims to have undertaken, and meeting minutes. I have already described their inadequacy as

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[90] As observed above, the meeting minutes are not complete and do not cover significant periods of time. Several suggest that results of tests were reviewed and analyzed, but unfortunately there is no detail, and the Appellant did not produce any of the trials or results that were reported to have been reviewed and analyzed. Some minutes say little more than review test results and continue trials.

[91] The one-page summary of the wind-resistance test was tendered by the Appellant, under objection from the Respondent because it was not disclosed in the list of documents or provided in the context of discoveries. But it is of little assistance to the Appellant in any event. Like the other summaries, it is an average summary of all the test results.

evidence of a scientific or systematic approach to a problem. But they are also wholly inadequate records of what the Appellant did.

[127] What documentary evidence is there of the tests? Very little. And yet the desirability of such evidence is obvious, particularly when the other three people identified as participating in the testing did not testify and the Appellant has no explanation for not providing details to the Court.[92]

[128] Mr. Baird said that the Appellant repeated each test at least seven times, and sometimes more until a consistent result was achieved. Mr. Baird said the results were then averaged to minimize the variance and the average reported in the test results summary page for the relevant test.

[129] Where are the details of all the measurements taken in these tests by four different people over the course of the year on which these averages were computed? Would it not be important to know whether the consistent result was observed over seven tests or 25 tests or more? Why would averages necessarily be relevant? Would the "worst" result and the "best" result, and the difference between them, not be relevant information? Yet the only evidence of results is a one-page test results summary for one version of the thermal performance test, the stress (uniform load) test and the wind resistance test. The Appellant did not even have a test results summary page for the revised tests.

[130] For example, although Mr. Baird said they ran the stress (uniform load) test on the shingle (i) unsupported, (ii) supported with foam strips, and (iii) with a support column, there is no summary for the tests with the foam strips or the support column. There is no summary for tests following the development of the lattice support or the tests related to the larger-sized panel.

[131] The one page test results summaries are missing significant information. For example, the thermal test result summary has a column labelled power output. Mr. Baird said that the power output was determined by multiplying the measurement from the volt meter by the measurement from the amp meter. Yet, the summary does not reflect even average volt and amp measurements. The test summaries do not indicate which version of the particular test is reflected, who completed the testing, when the testing was completed,[93] how many iterations of

[92] I address below the Appellant's contention it was never asked for them.

[93] Even in such broad terms as identifying the month.

each test were completed, what other observations the testers had or what conclusions, if any, were drawn from the test results.

[132] Where are the time sheets that Mr. Baird said they kept showing the time spent by the four individuals on the project? Where are the records that describe the shingles that were the subject of each test?[94]

[133] Even the documents the Appellant provided are inconsistent. For example, the Appellant provided two identical copies of the same stress (uniform load) test results summary page with different dates (November 15, 2012 and November 26, 2012). Revision 1.1 of this test, dated November 16, states the snow load should be increased to 600mm, consistent with meeting minutes from November 13. Yet the test results summary dated November 15 has results for the 600mm snow load test. The Gantt chart shows different dates again, indicating increased load testing was completed before November 18, having started the week of November 4. Revision 2 of the thermal performance test is dated September 27, 2012, as is the test results summary page for that test.[95]

[134] In my view, the documents the Appellant provided are far from what one would describe as detailed records. Frankly, they are not even good summary documents.

[135] Mr. Baird's oral evidence similarly was not persuasive. It changed in some respects over the course of his testimony and was inconsistent with the documents. For example, the minutes from the July 31, 2012 meeting reflect the observation that the aluminum mesh worked but was too costly and that Mr. Baird was to develop an alternative solution. This same conclusion is repeated in the Testing Summary, although none of the entries (nor the Testing Summary itself) is dated. This is inconsistent with part of Mr. Baird's testimony - that the aluminum mesh was a failure.[96] Mr. Baird described a standard solar panel as producing just under 150

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[94] Mr. Baird explained that there were slight differences in the Appellant's solar shingles, including for example their maximum power output. Would that not be relevant to note when testing the effect of heat on performance (power output)?

[95] Mr. Baird identified the test results summary page as relating to Version 2, although that is not noted on the test results summary page.

[96] "The aluminum mesh was insufficient and a failure. The only thing that produced a positive result was putting a space – air gap in – off of the roof structure." Transcript of December 12, page 59.

watts, or approximately 121 watts per square metre.[97] But when describing the scaling up in size of the Appellant's shingle, he said the goal was 250 watts per square metre, to be comparable to solar panels.[98] He said standard solar panels were too large and yet the Appellant scaled up to a shingle that was as large as, or somewhat larger than, what Mr. Baird described as a standard solar panel.

[136] The Appellant claimed it was never asked to provide the test results and that whenever it was asked to provide something it did. I wholly disagree with this assertion.

[137] In the course of the CRA review of the SRED claim in 2015, the Appellant was asked to provide "Records of trial runs related to your claimed work."[99] In response it provided the test result summaries for the thermal and stress tests (but not the wind resistance test) together with some meeting minutes.[100] Those are not records of trial runs. The CRA repeated its request for "contemporaneous documents with details of the claimed experiments…such as the objective of the experiment, planning, experiment procedure/experiment set-up schematic, and/or analysis of the test data."[101] In response, the Appellant supplied the hand-drawn schematics and descriptions of the tests performed, the same test result summaries previously provided, and the Testing Summary.[102] The Appellant was asked for similar documents in the course of written discovery,[103] and yet did not supply any of the underlying test results.[104]

[138] But whether the Appellant was asked for the records is irrelevant. The Respondent assumed in the Reply that the Appellant did not maintain adequate

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[97] Transcript of December 12, 2019, pages 29 and 35.

[98] *Ibid.*, pages 49 and 83.

[99] CRA letter dated April 27, 2015.

[100] By letter dated June 10, 2015. This letter was sent to the CRA by National on the Appellant's behalf.

[101] CRA letter dated October 28, 2015.

[102] By letter dated November 4, 2015. This letter was sent to the CRA by National on the Appellant's behalf.

[103] While Mr. Baird indicated he may have misunderstood the discovery question, I am not convinced there was confusion about what was being sought. Moreover, the Appellant is represented by counsel who could have clarified any uncertainty.

[104] Or even the wind resistance test summary page.

records. The Appellant has the burden of refuting that assumption, by establishing that it did. Yet the Appellant did not bring before the Court any of the detailed documentation it claims it had, but was never asked to provide.

[139] Finally, I note that the jurisprudence indicates that the documentation should be contemporaneous. The reasons are obvious. I confess that my impression is that the schematics and test descriptions the Appellant provided were not prepared before the tests were conducted, and as revisions were made, but rather subsequently when the CRA asked the Appellant for supporting documentation.[105] I have a similar impression of the Testing Summary. It appears to "lift" many of the point form notes from the meeting minutes and is undated. It was provided to the CRA after several requests for documentation. I am not convinced it was prepared in 2013 as the work was done.

[140] In conclusion, I find the documentary evidence submitted by the Appellant, as records of the activities, to be wholly inadequate and unreliable. They do not constitute detailed records of the Appellant's work.

VI. **CONCLUSION**

[105] For example, Revision 2 of thermal performance test (testing air gaps) describes measuring power output at 0, 10, 15, 20 and 25 mm gaps. Yet until the tests were completed, how would the Appellant know it would not need to test beyond a 25mm air gap. The test results summary is dated September 27, 2012, the same date as the schematic for Revision 2 to the thermal performance test to add an air gap. The test cannot have been revised, all the testing completed, and averages computed on the same day. It is also troubling that the dates of the Revisions do not correspond to the Gantt chart or the meeting minutes, as described above. Both the meeting minutes and Gantt chart indicate testing with the aluminum mesh occurred in July 2012. Yet the schematics suggest that first version of the thermal performance test was August 21, 2012, with Revision 1.1 to add the aluminum mesh occurring September 10, 2012. And, the August 21 minutes describe the action item as proceeding to air gap testing; the October 9 minutes reflect a conclusion that 25mm provided adequate cooling and a decision to proceed to snow loading trials. The Appellant tendered identical test summary reports for the stress (uniform load) test with different dates. As noted above the November 15, 2012 test results report information from a Revision to the test that occurred, per the schematic, on November 16, 2012, following a decision reported at a meeting on November 13, 2012. The schematic for the wind resistance test is dated March 19, 2013. The only reference to wind in the minutes is on April 9, 2013, but it does not refer to the wind tests results or an analysis. The minutes simply conclude a redesign of the support system is necessary to prevent flapping in high winds. Yet the Gantt chart suggests no testing whatsoever between February 17, 2013 and April 7, 2013 when the wind resistance testing commenced.

[141] The Appellant bears the burden of establishing that it conducted activities that constituted SR&ED by leading evidence to rebut the Respondent's assumptions. It has failed to do so. Accordingly, the appeal is dismissed.

[142] Costs of the motions and the appeal are awarded to the Respondent. The parties shall have until June 14, 2021 to come to an agreement on costs, failing which each party shall have until July 12, 2021 to file a written submission on costs. Each such submission not to exceed 15 pages in length.

Signed at Ottawa, Canada, this 14th day of May 2021.

"K.A. Siobhan Monaghan"

Monaghan J.

CITATION:	2021 TCC 36
COURT FILE NO.:	2018-369(IT)G
STYLE OF CAUSE:	LOGIX DATA PRODUCTS INC. v. HER MAJESTY THE QUEEN
PLACE OF HEARING:	Toronto, Ontario
DATE OF HEARING:	December 12 and 13, 2019 and February 25, 26, 27, 2020
REASONS FOR JUDGMENT BY:	The Honourable Justice K.A. Siobhan Monaghan
DATE OF JUDGMENT:	May 14, 2021

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