Technical Response to CCRA's Notice of Objection for the 9999 Taxation Year – Corp.No.99999999

SR&ED Claim : ABC Limited

File No.999999

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1 Introduction

The SR&ED program is a tax incentive initiative of the federal government designed to support and foster science and technology, particularly research and development (R&D) conducted by companies, in Canada. The work that is being claimed as SR&ED must meet the definition of SR&ED in subsection 248(1) of the ITA (Appendix E). To help establish this, three criteria are used: scientific or technological advancement, scientific or technological uncertainty, and scientific and technical content.

The following is the meaning given to *technology* in the standard dictionary:

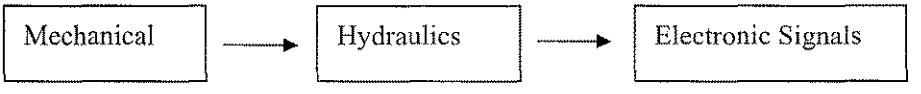
Systematic application of knowledge to practical tasks in industry.

Further, the term *uncertainty or uncertain* is described as follows:

Changeable, not reliable, state of being.

For the purpose of this response, the writer has relied on CCRA's Circular 86-4R3 issued May 24, 1994. On reviewing this circular, the writer believes that CCRA may have inadvertently based its decisions on the premise that the SR&ED project claimed by ABC Limited was a software development project. The project in fact falls within the machinery and equipment manufacturing industry and therefore CCRA's document No.94-2 : *Machinery and Equipment Industry Application Paper* is the more relevant interpretation of the Income Tax Regulations, as set out in subsection 2900(1) of the Regulations.

Sometimes, external parties in their enthusiasm to judge SR&ED projects fail to look at the components involving several technologies that make up that project. And that is understandable if someone admits having made an error in judgement. But, we need to correct that misunderstanding. The SR&ED project of ABC Limited covers several disciplines of engineering, including mechanical, hydraulics and computer/software engineering. Therefore the CCRA's guidelines for software development as well as IC94-2 (specifically, item 4.10 – Prototypes, custom products/processes, and commercial assets) needs to be referred to since the prototype that was being researched and developed had several cycles of development:



2 General Considerations in Identifying Eligible Activities

According to Circular 86-4R3, item 2.1, "ultimately, the question of what constitutes scientific and experimental development for purposes of the *Income Tax Act* can only be resolved by referring to the facts of each case."

Further item 2.4 Subsection 2900(1) of the Regulations goes on to define the several categories of scientific research and experimental development. **The categories which apply to the SR&ED claim of ABC Limited are:**

Category	Application
(b) applied research, namely, work undertaken to advance scientific knowledge with a specific practical application in view;	The applicable practical application is that of developing a prototype device that would enable accurate weight measurement with the functionality to correct the variations.
(c) experimental development, namely, work undertaken to achieve technological advances for the purpose of creating new, or improving existing, materials, devices, products, or processes, including incremental improvements thereto, or	The work undertaken by the contractor on behalf of ABC Limited was to create new, device that would improve on the measurement of the skid weights.
(d) work with respect to engineering, design, operations research, mathematical analysis, computer programming, data collection, testing, and psychological research, where such work is commensurate with the needs, and directly in support of the work described in paragraphs (b), or (c) above.	The pressure transducer that was used in the SR&ED project was intended to convert mechanical energy to digital signals and through a software interface this was to be displayed on a remote monitor.

3 How ABC Limited Conformed with the Spirit of the Legislation

According to item 2.11 of the IC 86-4R3, scientific research and experimental development varies in content as well as in the complexity of the technology in a given field. The technical uncertainties encountered by one taxpayer may well be looked upon as facts easily obtained by another. The judgement as to eligibility should be made within the context and environment of a single company and its field of business. Specifically, the activities undertaken to resolve technical uncertainties are eligible if the taxpayer cannot obtain the solutions through commonly available sources of knowledge and experience in the business context of the firm. We expect that any firm claiming expenditures for scientific research and experimental development activities will have or will access the expertise necessary to carry out a viable program.

Further, according to item 2.12 not all the work elements in a scientific research and experimental development activity will involve scientific or technological uncertainty. To conform to the spirit of the legislation, however, the overall activity must contain scientific or technological uncertainties. That is, the search for a meaningful advance in the body of scientific or technological knowledge should be present as a guiding element in every eligible project. This requirement is satisfied whether or not the activity is successful.

The **Project Definition** of the SR&ED claim of ABC Limited reads as follows:

PERFECT-DATA SYSTEM WEIGHING FUNCTION DEVELOPMENT FOR IMPROVED ACCURACY UTILIZING PRESSURE TRANSDUCER INSTALLED IN HYDRAULIC LIFT CIRCUIT

A typical material-handling vehicle such as forklift truck utilizes hydraulic lift cylinder to lift the load. The cylinder size changes in relationship to the lifting capacity of the vehicle. A pressure transducer mounted in the hydraulic line between the lift control valve and the lift cylinder measures the back pressure of the load lifted by the forks.

3.1 Technological Uncertainties

The technological uncertainties that prompted this SR&ED project are the factors that affect the accuracy of the readings of weights. Whilst standard mechanical engineering concepts could not eliminate the inaccuracies in the readings, the hypothesis that led to the project was converting one form of energy into another could eliminate the uncertainties. When analyzing the technology of this project, we have to take into consideration several components of the project viz.

a) Mechanical Engineering. Using the forklift truck's mechanical components to interact with the pressure transducer installed in the hydraulic circuit.

b) Hydraulic System and the vast array of related subsets, e.g. cylinder specifications, hydraulic fluid specifications, speed of lift, vibrations, torque, control valve opening, angle and height of lift, friction, temperate, etc.

c) Electronic Signals – software that enables the interface that controls the conversion and display on a monitor with the ability to store data in a database.

Looking at this project with external eyes, the writer could detect the technological uncertainties. These may not have been elaborated before. However, this was not done deliberately, but, due to oversight. ABC Limited admit that they may have defaulted in providing detailed documentation and they apologize for this deficiency which was strictly due to limited resources – one person project could not enable the luxury of an additional person to document the processes.

Some of these technological uncertainties were failure of hydraulic system to function or respond to the input from the load or from operator, vibrations, torque, hydraulic fluid defects of leakage, etc. Specifications of the pressure transducer not being up to required standard could cause the system to fail and result in technological uncertainties. Further uncertainties include the meter reading not be a true reflection of the weight, but rather the reaction of the intermediary fluid movement due to inefficient weight-balance control. The readings would fluctuate due to improper weight distribution on the skids. The most important technological uncertainty is the ability of the pressure transducer to change one form of energy into another and record the change accurately.

The signal obtained by the pressure transducer for a given load lifted is influenced by additional forces common to the typical forklift mast configuration. They are carriage/rail, cylinder and chain friction. In addition to these frictional forces, mast angle of lifted load, lifting height, speed of lift control valve opening and changes in hydraulic fluid temperature. These are scientific uncertainties for which there were no single answer.

Transducers are devices that change one form of energy into another. Because there are many different forms of energy – movement, acceleration, pressure, sound, radio waves, infrared, visible light, ultraviolet, X-rays, and gamma rays, to name just a few – the variety of transducers is enormous. Their applications are even more diverse and complicated.

3.1.1 Pressure Transducers

Pressure is not, as sometimes mistakenly thought, a force but a force per unit area (pressure = force/area). This fine distinction as far as a pressure transducer is concerned, for any device capable of converting applied mechanical force into some other form of energy is also, in fact, a pressure transducer converting a force per unit area into another form of energy. Thus force transducers can also be used for pressure measurement provided the area over which the force is applied is restricted and known. If reverse is the case, than that falls within the purview of technological uncertainty. Also, because the application of pressure is commonly associated with resulting mechanical movement or displacement of something to which it is applied, a displacement transducer is also capable of pressure measurement.

Evaluating the circuitry, frequency responses, input/output impedances, zero offset, excitation voltage, and different types of pressure transducers played a role in overcoming the technological uncertainties. These included:

- Diaphragm pressure transducers
- Strain-gauge pressure transducers
- Piezoelectric pressure transducers
- Capacitance pressure transducers
- Inductive/reluctance pressure transducers

3.1.2 Hydraulics

Hydraulic fluids must lubricate as well as carry the pressure. Therefore the following factors play a role in determining the right hydraulic fluid which could bear a relation to the accuracy of the weight readings:

- Temperature
- Ignition Point
- Lubricating Values
- Resistance to acids and alkalies
- Operating Range

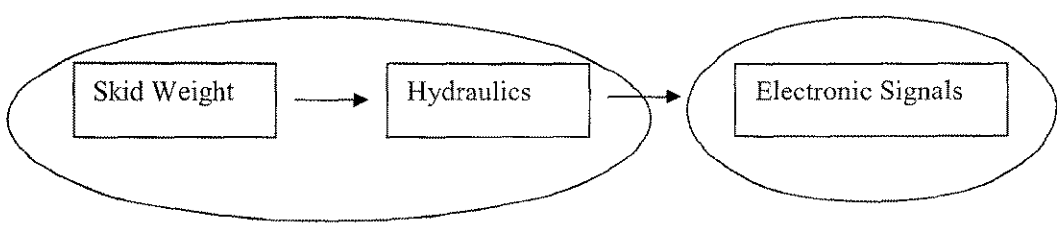
3.2 Technological Advancements

From the host of technological uncertainties elaborated above, the time, effort, knowledge and resources that were expounded diligently to overcome those uncertainties resulted in the following technological advancements:

1. Identified fixed and variable conditions, e.g. the factors that were affecting the weight accuracy were identified and were in the process of being controlled. However, due to the departure of the contractor, and other business condition, the entire project had to be cancelled
2. Through experimental development identified the process of converting the mechanical input (through the pressure tranducer) to digitized information which would be able to be displayed on remote monitor and data stored in a database.
    - GUI Interface for screen output
    - Remote readouts
    - Database capabilities
3. Developed a method to correct load read out errors through re-calibration.

3.3 Scientific and Technical Content

Through scientific research of each of the variable and experimenting systematically the correct procedures, ABC Limited was able to achieve technological advancement. The test results showed that the aforementioned technological uncertainties were addressed by bringing about scientific relationship between:



Mechanical Engineering Digital/Software Development

As a result of repeated standard testing, the uncertainties of inaccurate skid weights were corrected. Thus if there were any human errors in engaging the forks or uneven distribution of weights the re-calibration device would address that uncertainty.

Thus the PERFECT-DATA system challenged the original architecture and system performance in ways which caused the technical uncertainties to be addressed.

4 Conclusion

Based on the information provided in this document which elaborates on how the SR&ED project met the three qualifying criteria, we feel that the earlier decision should be reversed and ABC Limited be paid the claim amount.

It appears that there might have been some misunderstanding from all sides viz. On the part of ABC Limited in properly formatting their original claim submission leading to CCRA misunderstanding the SR&ED project as a combination of several disciplines of engineering, viz. Mechanical, hydraulics and electronic. This resulted in demands of source code which is not the focus of the project. There appears to have been some sort of misunderstandings, which unfortunately put barriers in comprehending the actual intentions of the project. It is true that the contractor involved has left ABC Limited and this has caused the documentation to suffer. But, this should not cause the taxpayer to be penalized. Evidence shows that the taxpayer did institute the project and endeavoured to the best of ability to bring it to fruition. But, as clarified in section 6.10(a) of the IC86-4, " As in any scientific or technological endeavour where uncertainty exists, some eligible activities are expected to have negative results."

As mentioned in the covering letter and repeated below:

I have endeavored to review the requisite information in support of the claim and have found the following through personal interviews:

1. The Corporate Controller – John Doe, filled in the role as SR&ED Project - Administrator, Documentor and Accountant - in addition to his main job as the Corporate Controller. Therefore, you will agree that the financials of the claim have been appropriately complied with at the expense of the documentation.
2. The President of the company – Henry Allen, filled the role as Direct Supervisor of the one and only SR&ED resource – Mike Kenmore who was the SME (subject matter expert) and the only brain behind the prototype that was being developed.
3. Mike Kenmore– as mentioned above – was the only resource assigned to this SR&ED project and his qualifications, experience and background have not been disputed and therefore not subject to contest under the CCRA's guidelines.
4. Due to limited staff and time, the documentation requirement could not be addressed.

Inspite of the fact that Mr.Doe and Mr.Allen spent a lot of their time on the SR&ED project, they did not try to take advantage of that fact and claim their time. This alone gives the impression that the company's intentions were genuine and they did not try to claim money just for the sake of claiming, as one comes across in other cases. Further the prototype which Mr.Allen had set out to develop through Mr.Kenmore's technical skills fulfilled the three criteria for an SR&ED project as I have described in detail in the attached document entitled "*Technical Response to CCRA's Notice of Objection for the 1996 Taxation Yeqar – Corp.No.103524229RC*". Furthermore, the prototype which Mr.Allen was endeavouring to develop was in relation to the line of freight forwarding business and therefore directly complied with the CCRA's guidelines.

There are two very important inaccuracies which need to be addressed. The first one is the SR&ED project which ABC Limited have claimed is for a prototype that they were trying to develop to address the technological uncertainties in weighing loaded skids accurately and this information was to be

relayed through a software interface to a remote monitor. The Science Officer who reviewed the case has inaccurately classified this as a software development. All the facts show that this is a mechanical-hydraulic-software engineering feat which complied with the three criteria. In this connection CCRA's information circular IC94-2 *Machinery and Equipment Industry Application Paper* has more relevance to the application.

The second inaccuracy is on page 4 of the letter under reference which states that ".....Mr. Kenmore appears to maintain the Intellectual Property rights to the work." ABC Limited has a document which confirms that they have the intellectual property rights to the work.

Based on the above two inaccuracies and from this document, we request you to kindly reconsider the past assessments and review the case on its merits. You will notice that the company has complied with the spirit of the legislation and therefore needs to be given the benefit of the doubt since CCRA has not proved beyond reasonable doubt that there was no SR&ED project at all and no evidence at all of the work that was undertaken by Mr.Kenmore. By leaving the company, Mr.Kenmore has put the company in an unfortunate situation of not recovering the documentation. However, this is an administrative deficiency, for which ABC Limited should not be penalized.

I believe Canada Customs and Revenue Agency have a "client-centered approach" and in support of this approach, cases which are not proved beyond a reasonable doubt could be reviewed through the ADR (Alternative Dispute Resolution) process. We request that this opportunity be given to ABC Limited.

In closing, I would like to thank Canada Customs and Revenue Agency, once again for giving an opportunity to ABC Limited to respond. We trust we have not disappointed you and look forward to your favourable response either with settling the claim or agreeing to the ADR process.

5 Document Information

This section provides information about this document and contains the necessary approvals.

5.2 Title and Author

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