

IN THE MATTER OF THE OTTAWA LIGHT RAIL TRANSIT

PUBLIC INQUIRY

The Honourable Justice William Hourigan, Commissioner

THALES CANADA INC. FINAL SUBMISSIONS

August 12, 2022

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A. EXECUTIVE SUMMARY

Thales Canada Inc. provided the automatic train signalling solution for the Ottawa Light Rail Transit Project. The evidence before the Commission was that automatic train signalling was not the source of any of the derailments or breakdowns which led to the creation of this public inquiry. Furthermore, numerous impartial witnesses testified that Thales Canada Inc.'s performance on the Ottawa Light Rail Transit Project was "very strong" and its technology was "best in class".

In an effort to assist the Commission in its work, Thales Canada Inc. has identified four main challenges it encountered during the course of the Ottawa Light Rail Transit Project. They are: 1) insufficient and ineffective systems integration; 2) delays related to the delivery of the infrastructure and the rolling stock; 3) loss of the maintenance expertise gained from training because of employee turnover; and 4) lack of involvement from the operators and maintainers of the Ottawa Light Rail Transit in the earlier phases of the project. Thales Canada Inc.'s recommendations to the Commissioner therefore aim to address these issues.

B. THALES' INVOLVEMENT IN THE OTTAWA LIGHT RAIL TRANSIT PROJECT

1. THALES CANADA

Thales Canada Inc., carrying on business as Thales Canada Transportation Solutions ("Thales Canada"), is a global provider of communications based train control ("CBTC") technology.

Thales Canada's involvement in Stage 1 of the Ottawa Light Rail Transit Project ("OLRT Project") is two-fold:

1) First, Thales Canada provided its Thales SelTrac™ CBTC solution for the OLRT Project, pursuant to a contract for the supply of Automatic Train Control Systems with OLRT Constructors ("OLRTC"), an unincorporated joint venture consisting of SNC-Lavalin Constructors (Pacific), Dragados Canada, Inc., and EllisDon Corporation.

2) Second, Thales Canada entered into a 30-year term Maintenance Subcontract with Rideau Transit Maintenance General Partnership (a partnership whose partners are ACS RT Maintenance Partner Inc., Protrans RT Maintenance Partner Inc. and EllisDon RT Maintenance Partner Inc.). Pursuant to this Maintenance Subcontract, Thales Canada has been providing maintenance services for the OLRT system, including with respect to the Automatic Train Control Systems.

2. CBTC TECHNOLOGY

Thales Canada's signaling products are among the first CBTC systems to be developed in the world. Thales Canada continues to be a leader in delivering CBTC systems that exceed client performance expectations, and in defining CBTC industry standards. In 2012, when Thales Canada submitted an offer for the OLRT Project, Thales Canada had 31 lines in revenue service totaling

900 kilometres, with a total of 1,100 kilometres contracted, and had installed CBTC solutions around the world for more than 26 years. There were then more than 900 transit track kilometres signalled with Thales SelTrac™ CBTC solution in over 35 cities including major transit centres such as London, New York, Hong Kong, Shanghai, and Beijing.¹

The Thales SelTrac™ CBTC technology has a proven industry track record for safety, quality, reliability and multiple features. Thales has experience interfacing with all major train manufacturers.²

As part of its role in Stage 1 of the OLRT Project, Thales Canada tailored the software of its SelTrac™ CBTC system to meet the physical environment in which the system would operate in Ottawa, as well as other parameters dictated by the contractual documents.³

3. MAINTENANCE

On the maintenance aspect, Thales Canada will continue to provide maintenance support for the OLRT Project until the end of the thirty-year term. In addition, Thales Canada has provided manuals and training for the maintenance and operation of the Thales SelTrac™ CBTC solution to OLRTC trainers (known as “Train the Trainer programs”). Thales’ training programs and manuals are well-established all over the world.⁴

C. THE EVIDENCE BEFORE THE COMMISSION

1. THALES CANADA WAS NOT RESPONSIBLE FOR DERAILMENTS OR BREAKDOWNS

The Terms of Reference identify the Project Issues as “breakdowns and derailments that led to a system wide temporary shutdown and have raised concerns in the public about the safety of the OLRT 1 Project.”⁵

¹ Exhibit 13, Package B-2, Design Submission Part 1, RTG 10 September 2012, COW0544752, <https://www.ottawalrtpublicinquiry.ca/files/evidence/Documentary-Evidence/COW0544752.pdf>, p. 185 of 349.

² Exhibit 13, Package B-2, Design Submission Part 1, RTG 10 September 2012, COW0544752, <https://www.ottawalrtpublicinquiry.ca/files/evidence/Documentary-Evidence/COW0544752.pdf>, pp. 185 and 187 of 349, Formal interview of Paul Dooyeweerd by Christine Mainville on May 20, 2022, <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Paul-Dooyeweerd-May-20-2022.pdf>, p 91.

³ Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, pp. 8-9.

⁴ Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, p. 86.

⁵ Order in Council 1859/2021, Dec 16, 2021.

The evidence has shown no link between the Thales SelTrac™ CBTC solution and Project Issues.⁶ Indeed, none of the investigation reports available at the time of writing mention the signalling system as a root or contributing cause of the derailments.⁷

Thales Canada conducts its own rigorous safety testing for its CBTC system. Thales Canada, however, cannot and does not assume responsibility for the safety of the entire system.⁸

2. THALES CANADA'S STRONG PERFORMANCE ON THE OLRT PROJECT

Several non-Thales Canada witnesses emphasized the fact that Thales Canada's performance on the OLRT Project was very strong.⁹ Rupert Holloway, SVP Construction for SNC Lavalin and OLRTC board member, stated that the Thales SelTrac™ CBTC signalling system was "best in class".¹⁰ Furthermore, non-Thales Canada witnesses explained that Thales Canada was transparent and collaborative about the challenges it encountered, for example in pointing out the unachievable nature of the Revenue Service Availability date to OLRTC more than a year in advance.¹¹

⁶ Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, pp 89-96.

⁷ Exhibit 091 - Alstom LRV 1119 Derailment Investigation Report 10 May 2022, Exhibit 158 - Alstom Incident Report LRV 1119 Mainline Derailment 27 October 2021, Exhibit 264 - RTG Letter to City of Ottawa with attached Derailment Summary Report 8 October 2021.

⁸ Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, pp, 59-63, 73, Formal interview of Paul Dooyeweerd by Christine Mainville on May 20, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Paul-Dooyerweerd-May-20-2022.pdf>, pp, 39- 43.

⁹ Cross-examination of Rupert Holloway by Peter Mantras on June 17, 2022 : www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Five-June-17-2022.pdf, p. 186 and ff., Cross-examination of Jacques Bergeron by Peter Mantas on June 21, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Seven-June-21-2022.pdf>, p. 158 and ff, Cross-examination of Matthew Slade by Jennifer McAleer on June 24, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Ten-June-24-2022.pdf>, p. 130 and ff., Cross-examination of Michael Morgan by Peter Wardle (City of Ottawa) on June 27, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Eleven-June-27-2022.pdf>, p. 92.

¹⁰ Cross-examination of Rupert Holloway by Peter Mantras on June 17, 2022 : www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Five-June-17-2022.pdf, p. 187.

¹¹ Cross-examination of Matthew Slade by Jennifer McAleer on June 24, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Ten-June-24-2022.pdf>, p. 130 and ff., Examination in chief of Rupert Holloway by Fraser Harland on June 17, 2022 : www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Five-June-17-2022.pdf, p 140, Cross-examination of Jacques Bergeron by Peter Mantas on June 21, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Seven-June-21-2022.pdf>, pp. 158 and ff.

Many non-Thales Canada witnesses also confirmed that the architecture of the CBTC system supplied by Thales Canada for the OLRT Project was service proven and was not new.¹²

D. CHALLENGES ENCOUNTERED BY THALES CANADA ON THE OLRT PROJECT

1. SYSTEMS INTEGRATION

The main challenge encountered by Thales Canada on the OLRT Project was the lack of sufficient involvement and direction from a systems integrator in order to facilitate the integration between the CBTC system and the rolling stock.¹³ The role of systems integrator, which should be filled by one or, in this case, many experienced engineers,¹⁴ is to bring all component subsystems into a whole and to ensure that those subsystems function together to meet the prime contractor's requirements for the various systems.¹⁵

It is important to have a systems integrator involved from the very beginning.¹⁶ Unfortunately, in this case, the evidence is that there was no effective system integration until 2014.¹⁷ The consequence of this gap is that Thales Canada and the rolling stock provider, Alstom, were left to their own devices to address integration issues as they arose on an *ad hoc* basis without the

¹² Cross-examination of Rupert Holloway by Peter Mantras on June 17, 2022 : www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Five-June-17-2022.pdf, p. 186 and ff., Cross-examination of Jacques Bergeron by Peter Mantas on June 21, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Seven-June-21-2022.pdf>, p. 158 and ff., Cross-examination of Matthew Slade by Jennifer McAleer on June 24, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Ten-June-24-2022.pdf>, p. 130 and ff., see also [Cross-examination of Yves Declercq by Peter Mantas on June 16, 2022 : https://www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Four-June-16-2022.pdf](https://www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Four-June-16-2022.pdf), p. 98 and ff.

¹³ Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, pp. 16-20, Examination in chief of Michael Burns by Fraser Harland on June 20, 2022, : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Six-June-20-2022.pdf>, pp. 80-84.

¹⁴ Formal interview of Paul Dooyeweerd by Christine Mainville on May 20, 2022, <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Paul-Dooyerweerd-May-20-2022.pdf>, pp. 25-28.

¹⁵ Formal interview of Paul Dooyeweerd by Christine Mainville on May 20, 2022, <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Paul-Dooyerweerd-May-20-2022.pdf>, pp. 21-37.

¹⁶ Formal interview of Paul Dooyeweerd by Christine Mainville on May 20, 2022, <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Paul-Dooyerweerd-May-20-2022.pdf>, p. 23-24.

¹⁷ Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, p. 48, Examination in chief of Michael Burns by Fraser Harland on June 20, 2022, : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Six-June-20-2022.pdf>, pp. 80-84, pp. 95-96.

mediating influence of a system integrator able to make trade-off decisions in case of disagreement between the subcontractors.¹⁸

Ultimately, the integration issues between the CBTC system and the rolling stock were resolved through numerous exchanges between Thales Canada and Alstom, as well as some contractual variations.¹⁹ This process, however, was more labour-intensive and more protracted than is usual in the industry.²⁰

2. DELAYS AND LACK OF INTEGRATED SCHEDULING

Another important challenge for Thales Canada on the OLRT Project were the multiple delays experienced. Delays that most directly affected Thales Canada were delays in the delivery of the rolling stock, which in turn affected the timeline of Thales Canada testing.²¹ There were also several delays related to the infrastructure and civil work, for example the infrastructure necessary for testing, which also delayed Thales Canada testing.²²

Notably, infrastructure and civil works delays created a delay in the completion of the Belfast yard, originally planned for completion and automation prior to the start of Revenue Service. Due to these delays it was decided to complete the Belfast Yard after Revenue Service. The Belfast yard is still not automated, in part because Thales Canada has not been given sufficient access to the Belfast yard to complete its test program.²³

¹⁸ Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, pp. 50-52.

¹⁹ Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, pp. 17-18, 23-24.

²⁰ Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, pp. 25-26.

²¹ Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, pp 31-34, p. 99, Examination in chief of Michael Burns by Fraser Harland on June 20, 2022, : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Six-June-20-2022.pdf>, p. 84.

²² Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, pp. 59-70.

²³ Examination in chief of Michael Burns by Fraser Harland on June 20, 2022, : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Six-June-20-2022.pdf>, p. 72, Formal interview of Paul Dooyeweerd by Christine Mainville on May 20, 2022, <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Paul-Dooyerweerd-May-20-2022.pdf>, pp. 86-88.

Several of the delays experienced on the OLRT Project could be traced back to a lack of overall integrated scheduling, as well as schedule misalignment between the delivery schedule of Thales Canada and that of the rolling stock provider, Alstom.²⁴

Without having an integrated schedule aligning the schedules of the various subcontractors, the principal contractor, OLRTC, had difficulty determining when the project would be complete.²⁵ In turn, from Thales Canada's and other contractors' perspective, it was very difficult to plan for resource allotment for commissioning in segments when the final dates were in flux, which potentially led to further delays.²⁶ Finally, some of the difficulties Thales Canada experienced in finalising the interfaces with the rolling stock provider, Alstom, were associated with a misalignment between the expectations stemming from Alstom and Thales Canada's contracts with OLRTC, as well as a lack of timely and effective systems integration.²⁷

The delays experienced by Thales Canada were ultimately resolved by accelerating the testing phases, which was achieved by deploying additional resources, and by pushing back the Revenue Service Availability Date.²⁸

3. TRAINING EFFICIENCY

Thales Canada is concerned that the maintenance and operations expertise Thales Canada has provided through its Train the Trainer programs has been lost due to the original trainers no longer being employed by OLRTC and the high employee turnover at Alstom maintenance. This expertise is not being re-established by additional training, despite Thales Canada's offer to provide such training.²⁹

²⁴ Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, pp. 48-49, 57, 100.

²⁵ Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, p. 57.

²⁶ Formal interview of Paul Dooyeweerd by Christine Mainville on May 20, 2022, <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Paul-Dooyeweerd-May-20-2022.pdf>, pp. 47-48.

²⁷ Examination in chief of Michael Burns by Fraser Harland on June 20, 2022, : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Hearing-Transcripts/Day-Six-June-20-2022.pdf>, pp. 84-89, Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, pp. 27-30, 34-45.

²⁸ Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, pp. 70-72.

²⁹ Formal Interview of Michael Burns by Christine Mainville on March 31, 2022 : <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Michael-Burns-March-31-2022.pdf>, pp. 82-83, 87.

4. LACK OF STAKEHOLDER INVOLVEMENT

Finally, the absence of the principal stakeholders, i.e., the operators and maintainers of the OLRT system, during the initial design stages of the OLRT Project has been a challenge for Thales Canada. The absence of these stakeholders from earlier discussions made it difficult to adjust the CBTC system to the stakeholders' needs, as their input was often communicated too late in the process, after the relevant decisions had been made.³⁰ Nonetheless, Thales Canada made all possible adjustments to accommodate the stakeholders' requests when such requests were made known to Thales Canada.³¹

E. PROPOSED RECOMMENDATIONS

Thales Canada respectfully submits that the Commissioner consider making the following recommendations:

1. SYSTEMS INTEGRATION

System integration should be a priority from the earliest stages of an infrastructure project of this nature. This can be achieved by ensuring that a sufficient number of individuals with the right experience are involved at the bid stage and throughout the life of the project.

2. DELAYS AND LACK OF INTEGRATED SCHEDULING

There should be realistic integrated scheduling throughout the life of the project in order to avoid unnecessary delays. A clearly defined timeline would allow subcontractors such as Thales Canada to strategically plan the allotment of their resources and significantly increase efficiency. The contractual structure of the various subcontracts must also be coordinated so that subcontractors' workflows are aligned.

3. TRAINING EFFICIENCY

Operators and maintainers of the system must be adequately trained. In particular, training must be renewed if there is high employee turnover.

4. LACK OF STAKEHOLDER INVOLVEMENT

Primary stakeholders, such as the operators and maintainers of the system, should be involved from the earliest stages of the project and remain involved throughout the execution of the project.

³⁰ Formal interview of Paul Dooyeweerd by Christine Mainville on May 20, 2022, <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Paul-Dooyeweerd-May-20-2022.pdf>, pp. 98-100.

³¹ Formal interview of Paul Dooyeweerd by Christine Mainville on May 20, 2022, <https://www.ottawalrtpublicinquiry.ca/files/evidence/Transcripts-of-Formal-Interviews/Thales-Canada-Inc.-Paul-Dooyeweerd-May-20-2022.pdf>, p. 100.

ALL OF WHICH IS RESPECTFULLY SUBMITTED

Ottawa, this Aug 12, 2022

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