Ottawa Light Rail Commission

Joseph Marconi
on Tuesday, May 10, 2022

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OTTAWA LIGHT RAIL COMMISSION

OLRT CONSTRUCTORS - JOSEPH MARCONI

MAY 10, 2022

--- Held via Zoom Videoconferencing, with all participants attending remotely, on the 10th day of May, 2022, 9:00 a.m. to 12:10 p.m.

COMMISSION COUNSEL:
Anthony Imbesi, Litigation Counsel Member
Fraser Harland, Litigation Counsel Member

PARTICIPANTS:
Joseph Marconi: OLRT Constructors
Mannu Chowdhury: Paliare roland Rosenberg Rothstein LLP

ALSO PRESENT:
Helen Martineau, Stenographer/Transcriptionist,
Benjamin Bilgen, Virtual Technician

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--- Upon commencing at 9:01 a.m.

JOSEPH MARCONI: AFFIRMED.

ANTHONY IMBESI: Good morning, Mr. Marconi, as you were doing that I heard your voice coming in and out, so if at any point we don't hear you I will ask you to repeat your answer. We'll let you know.

JOSEPH MARCONI: Maybe it's the video.

ANTHONY IMBESI: The reality of the Zoom hearings. I will read into the record the parameters of today's interview and then we can get started.

The purpose of today's interview is to obtain your evidence, under oath or solemn declaration, for use at the Commission's public hearings. This will be a collaborative interview such that my cocounsel, Mr. Harland, may intervene to ask certain questions. If time permits your counsel may also ask follow-up questions at the end of the interview. This interview is being transcribed and the Commission intends to enter this transcript into evidence at the Commission's public hearings, either at the hearings or by way of procedural order before the hearings commence. The

transcript will be posted to the Commission's public website, along with any corrections made to it after it is entered into evidence.

The transcript, along with any corrections later made to it, will be shared with the Commission's participants and their counsel on a confidential basis before being entered into evidence.

You will be given the opportunity to review your transcript and correct any typos or other errors before the transcript is shared with the participants or entered into evidence. Any nontypographical corrections made be will be appended to the transcript.

Pursuant to section 33(6) of the Public Inquiries Act, a witness at an inquiry shall be deemed to have objected to answer any question asked him or her upon the ground that his or her answer may tend to incriminate the witness, or may tend to establish his or her liability in civil proceedings at the instance of the Crown, or of any person. And no answer given by a witness at an inquiry shall be used or be receivable in evidence against him or her in any trial or other proceedings against him or

her thereafter taking place, other than a prosecution for perjury in giving such evidence. As required by section 33(7) of that Act you are hereby advised that you have the right to object to answer any question under section 5 of the Canada Evidence Act.

So with that we will get started. Actually, if you could start by explaining for us your role in Stage 1 of Ottawa's LRT?

JOSEPH MARCONI: Sure. In around August of 2018 I was hired by OLRTC. I was actually hired by SNC Lavalin, seconded to the OLRTC Ottawa project, I took over for Jacques Bergeron, who was going to retire at that time. And basically my main tasks were to complete the Stage 1 vehicle provisional acceptance process, complete any vehicle testing and commissioning that needed to be done, to conduct vehicle final acceptance in preparation for substantial completion, trial running, revenue service availability. And then once that was done I would move on to the Stage 2 project -- Stage 2 part of the project and basically repeat the same thing, vehicle provisional acceptance, vehicle commissioning, and final acceptance bill

of sale and revenue service entry.

ANTHONY IMBESI: And you have shared with us, with the Commission, your -- a copy of your CV. I'll pull that up on the screen. Can you see what's on my screen?

JOSEPH MARCONI: Yes.

ANTHONY IMBESI: And do you recognize this as a copy of your CV?

JOSEPH MARCONI: Yes, I do.

ANTHONY IMBESI: And I see that you're a mechanical engineer?

JOSEPH MARCONI: Correct.

ANTHONY IMBESI: And can you just give us, at a high level, a summary of your background prior to being involved with SNC Lavalin and OLRTC, and in particular your experience in rolling stock passenger rail experience?

JOSEPH MARCONI: Well, I've been thirty-six years in the business, twenty-five years with Bombardier, six years with other companies like UTDC, which are now defunct. Even Lavalin, at one time -- I was with Lavalin for two years. And then my last four years of my career I've been with SNC Lavalin.

All those years I've been involved with railcar projects, passenger railcar projects. I've had various responsibilities. I started off as a designer. I worked my way into -- as a test engineer. I became a production supervisor. I became a methods manager and engineering manager, system engineering manager, vehicle integrator. I was also involved in customer service on the New York Subway contract. I was a quality assurance manager. I was also involved in change management. And basically those are all the functions that I held through my first 32 years of my career.

And the last four years of my career I've been with Lavalin as System Integration Director.

ANTHONY IMBESI: And prior to this project have you been involved in any projects that were P3 projects?

JOSEPH MARCONI: Per se, not really. I mean, I believe a monorail project that we had in Las Vegas was a P3 type project, but I was so far down the level there that I didn't have relations with, say, the end customer, other

than with the vehicle design, or with the infrastructure, construction stations, track work, things like that; it was strictly at the vehicle level.

So I believe I've been involved in a P3 before, I believe the Las Vegas project was a P3, but I'm not 100 percent sure about that.

ANTHONY IMBESI: And you had touched on your role as their director of systems and integration, but can you give us a bit of an understanding as to what that role is comprised of? What are the responsibilities of that role?

JOSEPH MARCONI: Well, when I came on board it was mainly the system integration with the vehicle, not necessarily any system integration with civil infrastructure or OCS or tracks, nothing like that. It was mostly integration work that needed to be done between Alstom and Thales, any interfaces there that need to be resolved, and integrating those systems from a vehicle perspective so that that vehicle would be safe to operate and reliable on the main line.

ANTHONY IMBESI: And obviously this project achieved revenue service availability in

August of 2019, and you touched on this, but did your role change at all following revenue service or did you simply transition to performing the same functions in respect of the Stage 2 production and assembly?

JOSEPH MARCONI: Well, I still maintain a bit of role on Stage 1 because of -- there are still minor deficiencies that Alstom needs to correct, so I need to follow-up and make sure that those items are actioned upon. So from a Stage 1 perspective I'm still involved in that area of it.

I'm still also involved in the Change Control Board, which is headed by RTM, supporting and acting as a sounding board with Alstom, or Thales may come along with proposed changes to the vehicle. But, yes, those are probably two areas that I'm still involved in on Stage 1.

And on Stage 2, basically starting fresh, delivering those vehicles in terms of inspections, validating the commissioning of those vehicles and final acceptance, and right through to the bill of sale.

ANTHONY IMBESI: Again, I'll stop

sharing your CV here on the screen. If we could mark that as Exhibit 1.

EXHIBIT NO. 1: Curriculum Vitae of Joseph Marconi.

ANTHONY IMBESI: You had just mentioned the Change Control Board, can you give us an explanation as to what that is and how it functions, particularly now in respect of the Stage 1 vehicles?

JOSEPH MARCONI: Okay. So the purpose of the Change Control Board is to -- obviously to maintain configuration of the infrastructure, even the vehicles, anything to do with change. So if a subcontractor or a supplier wants to make a change then they have to submit a CR request, a change request to the Change Control Board. And this change request includes, you know, the reasons for the change, how the change is going to be tested, how the change is going to improve something or change something. And then this is vetted by the Change Control Board, by the CCB, Change Control Board. Once it's vetted by them then we pass that information along to the City and then they also vet the change; and they are part of the board as well.

And if everything meets everybody's requirements then the change is approved and the method of implementation is determined, whether it needs to be tested or whether it doesn't need to be tested. And a schedule may be drawn up as to which vehicles will receive the changes first. And then the subcontractor is then allowed to make those changes and everybody is aware of what's going on.

ANTHONY IMBESI: Is that separate and apart from -- if retrofits are being done or if minor deficiencies are being corrected, that kind of thing, does that flow through that process or is this separate? Is this where there is a more major change to the vehicle itself?

JOSEPH MARCONI: Yeah, those are separate, more major ones. But there are probably other changes, some historical or background changes that Alstom may be doing that may not go through the Change Control Board, that have little impact in terms of safety or reliability of the vehicle. So these are generally changes that could affect the safety or reliability of the vehicle that go through

the Change Control Board.

ANTHONY IMBESI: And who sits on that board?

JOSEPH MARCONI: Steve Nadon sits on that board, James Robilard sits on that board, Tammy Levesque I believe sits on that board. I sit on the Board as an OLRTC representative. I believe Matt Peters sits on that board from OC Transpo's perspective.

ANTHONY IMBESI: So just so I understand the entities, so you have OLRTC, OC Transpo, is there somebody from RTG on the Board?

JOSEPH MARCONI: I don't believe there is.

ANTHONY IMBESI: So would it just be OLRTC and OC Transpo, to your knowledge?

JOSEPH MARCONI: RTM sits on the Board.

ANTHONY IMBESI: RTM?

JOSEPH MARCONI: RTM, yeah. OLRTC, RTM, the City, basically those three entities. And then obviously, you know, the people that are submitting the change request are the initiators, right?

FRASER HARLAND: Can you give us some examples of changes that would come through the Change Control Board?

JOSEPH MARCONI: For example, a change to a ceiling panel. Alstom has proposed that they've got a new supplier for their ceiling panels, for example.

And so what we do, first, before it goes to the Change Control Board, is that ceiling panel design gets presented to the City, between OLRTC and Alstom and the City. Then from a design perspective that -- that design is approved through that channel, through letters and correspondence and meetings that we have. Once that is approved it goes through the Change Control Board to get approval for implementation on the rest of the fleet. So there's one example.

Software changes from Thales, for example, where they have to initiate a complete software architecture change. Well, Thales will submit a change request for build 8 or build 9 of their software, and it will entail all the changes that are within that change because there are probably multiple corrections of

software there that they're going through.

They will explain what testing needs to be done, what testing has been done, whether those tests have shown promising results. And then there will be an implementation phase where maybe they will install the software for a certain period of time. They will test it and validate that it's working within one or two weeks and then report back on that.

And then the next step would be a full, system-wide implementation. So it could be software, hardware, electrical, mechanical, all sorts of different changes can go through this Change Control Board.

ANTHONY IMBESI: And just before we move on from the Change Control Board, and we'll discuss this in a bit more detail later this morning, but in terms of the breakdowns and derailments the system experienced in 2021 and some of the other issues, has anything from those breakdowns and derailments flowed through the Change Control Board in terms of anything that's implemented to address any issues that were uncovered?

JOSEPH MARCONI: No. Nothing after

the derailment.

ANTHONY IMBESI: Okay. And you've spoken about the responsibilities generally of the Director of Systems and Integration, the role that you fulfill. But from a practical level, can you just give us some insight as to what the management of the vehicle integration testing and commissioning activities is comprised of, what that entails and how it's undertaken on a project like this?

JOSEPH MARCONI: From a testing and commissioning perspective, I would like to break it down to probably before we went into revenue service, or RSA. Because certain tests had to be done in order to qualify the vehicle, you know, type testing and series testing needed to be done and reports submitted. Those would be like one-off type tests that needed to be completed and submitted and passed and approved by the City.

But as we move on, like for Stage 2, for example, the testing side of it is generally series testing, like each vehicle gets series testing. There is very few or no type testing conducted any more. These are all series

testing, which means that each vehicle sees a certain number of tests, whether that's static verification tests, dynamic and propulsion and braking tests that are also witnessed by OLRTC and the customer.

And then we go through like a burn-in, a test of a thousand kilometres, which is dynamic, on the main line. So those are the type of commissioning tests that we do before the vehicle is allowed to be sold.

ANTHONY IMBESI: And you -- I mean, I know you've mentioned some of the tests that were -- that are done or are going to be done on the Stage 2 vehicles. Is it fair for me to assume then that those same tests would have been performed in respect of the Stage 1 vehicles as well?

JOSEPH MARCONI: Other than the burn-in test -- the reason that there is a difference there is because as the vehicles -- as the Stage 1 vehicles are being prepared and provisionally accepted, those vehicles are also being used by OC Transpo for driver training. They are being used for Alstom testing, Thales testing, OLRTC integration testing with the

infrastructure.

So those vehicles, you know, they went through -- I think by the time that RSA took place, back in August of 2019, some of those vehicles had already seen well over 30,000 kilometres. And so -- and I think the lowest vehicle at that time, the lowest mileage on the most newest vehicle entered onto the main line was in around you know, 1500 to even 2,000 kilometres at that time.

So when we developed -- when I developed the testing and commissioning procedure for Stage 2, we decided that it would be advantageous that each vehicle also go through a 1,000 kilometre burn-in exercise so that it could reflect at least the minimum amount of mileage that one of the vehicles saw on the Stage 1 project, if you follow my thought there.

ANTHONY IMBESI: I do. So you -- in preparing the plans for testing and commissioning for the Stage 2 vehicles you have designed this burn-in test. So is it your evidence then that you feel the same outcome was achieved on Stage 1, just given the fact that

the vehicles had run for a significant period of time in performing other integration test training, whatever it might be?

JOSEPH MARCONI: Correct. And obviously the maturity. Since Stage 2 started there's been a number of modifications and changes and improvements and software upgrades. So as the product matures it's getting better and better and better.

So, even though we are doing the thousand kilometre burn-in, we have had instances where the vehicle has not passed the test. And the criteria for passing the thousand kilometre burn-in is that you can't have a service affecting failure that lasts more than five minutes, which is what a train in normal revenue service, if that were to happen, would be pulled out of services and replaced by another one.

So we apply that same pass/fail criteria as any normal running revenue service train would apply. And we've had some cases where failures have caused a five-minute delay, and if that were to occur then the burn-in starts over again. So you could have 6, 700

kilometres, have a failure that last more than five minutes and you'd have to pull that -- you'd have to restart -- fix the problem and then start over again.

ANTHONY IMBESI: So turning our focus strictly to Stage 1 for now, OLRTC has the ultimate responsibility for systems integration, correct?

JOSEPH MARCONI: Yes.

ANTHONY IMBESI: And in terms of systems integration, your focus was primarily with respect to Alstom, and, I guess, to a certain extent integrating that with the Thales' signaling system?

JOSEPH MARCONI: Correct. I mean, when I got on board in 2018, August of 2018, most of the integration -- design integration work was already completed. There was only a handful of items that were still not working properly or not clear. Like maybe five or six items that still needed some -- they still needed some attention between Alstom and Thales. But all the rest of it was basically done. All the design effort, all of the integration in terms of design effort was already done when I

started the project in August.

ANTHONY IMBESI: So perhaps then, can you explain for us -- so as I understand it, the May 2018 RSA date was missed by OLRTC and RTG. And you came on board in August of 2018. You mentioned that most of the design integration work was completed. Can you give us some examples then of what the status was when you arrived? What was outstanding? What still needed to be done to get the vehicles to a point where RSA was ultimately achieved the following August?

JOSEPH MARCONI: Now you're really testing my memory. When I first came on board there were a few integration issues, like I mentioned, between Thales and Alstom that still needed to be sorted out. Not all the vehicles had been provisionally accepted yet at that time. Jacques, my predecessor had accepted 28 of the 34 vehicles.

And what I mean by "provisional acceptance" is that we did a safety certificate from Alstom that the vehicle is considered safe to operate, at least in manual mode operation on the main line. That way the vehicle can be

driven by OC Transpo in manual mode, it can be driven by ORTC for integration testing, or we can have the drivers drive the trains for Thales testing. So there was 28 vehicles that have already been provisionally accepted at that time.

The rest of the vehicles, I believe, were -- obviously in production still with Alstom. And I had to -- I had to follow those ones straight to provisional -- completion of provisional acceptance. After provisional acceptance is done then those trains go over to Thales for them to do their integration testing, their validation of their equipment. They perform their static and dynamic testing for the automatic train control, CBTC systems operations.

And once that was complete we would get a notification that that train was okay to operate in automatic mode. And then additional testing was done, integration was done at that stage once the vehicles are ready automatic train operation.

Once that was done I also the developed a final inspection on procedure. At

that time, in order to get to substantial completion, in order to get to trial running we had to have the vehicles at least finally accepted by the City. So I developed a process for which that could be obtained, and a schedule.

And I believe between January and March of 2019 every vehicle was inspected, both by OLRTC and the City; Alstom was there as well.

And we went through and created what we call the "OLRTC punch list", and this punch list became part of the car history book. And on average we would get about a hundred open items per vehicle. So at the end of March we had about 3200 items that needed to be corrected on those vehicles. Some prior to revenue service and some were okay to be left open for Alstom to correct during the warranty period.

ANTHONY IMBESI: Can you just explain for us a little bit more about this punch list? What would find its way on the punch list? You mentioned there were about a hundred open items per vehicle, is that typical or is that excessive? Is that below average?

JOSEPH MARCONI: I would say I think

it's a bit above average. And the reason I would say that is I've been involved in quality assurance before with Bombardier. But the Stage 1 vehicles were kind of like a different concept for me because I was normally involved where you would do one vehicle at a time. You would inspect one vehicle at a time and the customer would inspect that with you.

And then obviously through all those inspections you would go to the case where the vehicle was finally accepted and then delivered and sold and commissioned on site and then put into revenue service.

On the Stage 1 project we had 34 vehicles to go through all basically in one shot. And I've never done that before, having to inspect 34 vehicles basically consecutively like this. In addition, those vehicles were no longer brand new, they were used. They were used for testing, all sorts of -- OC Transpo was driving them. We were testing them for Thales integration testing, Alstom integration testing.

So when you went on to a vehicle it didn't give you the sense that the vehicle was clean and pristine and like a brand new vehicle

that you would see at a car showroom, like you're going to buy a brand new automobile. They had a little bit of wear and tear on them.

Some of the open punch list items had to address the cleanliness and the clean-up and the scratches and the dings and the dents that you would not normally expect from a brand new vehicle, but it just wasn't there because these vehicles were previously used.

ANTHONY IMBESI: Right. And so could you explain for us then -- so what items that found -- that would find their way on to the punch list would need to be rectified before revenue service versus those that you said were approved or okay to be deferred to post revenue service?

JOSEPH MARCONI: Okay. For one example, we had issues with the cab doors, the glass cab doors, they would crack and break and shatter. So that was definitely a safety issue and also a security issue for the drivers. So that was on the punch list.

And in order for the trains to go into revenue service Alstom had to temporarily install plexiglass or Lexan plastic doors. They

were nonconforming at the time. The City was aware of that; we were aware of that. We were okay with it but we knew that the doors would not stay there permanently in the Lexan plastic format. And Alstom would later go back onto the vehicles, after they entered revenue service as they secured a new supply of materials, new glass, new door frames, new materials that were stronger and more sturdier, and began replacing them. So now all Stage 1 vehicles have new cab doors, that would be a good example.

ANTHONY IMBESI: So is it more so safety and security issues, those would need to be dealt with up front, most other things there's a possibility that they could be deferred?

JOSEPH MARCONI: Correct. Where there was a long lead time for parts and things like that that -- unless there was a work-around plan, if there was a -- like the one example I just gave was mostly a safety and security thing. So we had to do something. We had to do a mitigation plan for that one because obviously the trains couldn't go into service with the doors that they had. But for other items that

didn't present themselves as a safety and security item then we could transfer over to the warranty phase.

But some of the esthetic items were also cleaned up. I believe by the time June rolled around I think out of those 3200 items I think Alstom had corrected well over 2700 of them. And there was like another 6 or 700 of them that needed to be transferred over to the warranty side of things.

ANTHONY IMBESI: In your experience the transfer of 6 to 700 items to the warranty period, is that something that's typical? Is it manageable? Did you feel it was manageable on this project in particular?

JOSEPH MARCONI: At the time I felt it was manageable. Because what happened at that time was we kind of got -- the warranty period is two years. So what happened was that when we went through substantial completion and we submitted -- the MDL list was generated and created. What was asked of us was to take all those punch list items that remained during the warranty period and put them on to the MDL list.

Say, for example, out of those 700

items each vehicle had the same item, the same problem, so that was 34 items. It was really only one problem but 34 times because there's 34 vehicles that had the same issue. So when we flipped those over to the MDL, the MDL list grew to about 302 items we had to correct within a six-month time period. So to me that was kind of aggressive.

And to this day, like I said earlier on in my interview here, in my discussions, we still have MDL items that we're still following to this day, and this is two and a half years, three years since revenue service started.

ANTHONY IMBESI: And when you say "MDL" is that referring to the minor deficiency list?

JOSEPH MARCONI: That's correct, the minor deficiency list. With Alstom we're sitting around 65, 66 items that are still being tracked and followed.

ANTHONY IMBESI: And so in terms of the minor deficiency list, those items related to the LRVs, those would be populated into the MDL from the punch list, as you described?

JOSEPH MARCONI: Correct. They were

populated that way.

There was other items, some major items, that were on the MDL list. They're major but they're more significant than some of the other minor items that we found during our inspections.

Like, for example, the auxiliary power supply. Alstom had some issues with their auxiliary power supply vendor, they were blowing up on us and Alstom were repairing them and trying to keep the trains running. To this day I think they have tried to secure a second source because I guess their relationship with their primary supplier has deteriorated. So now they've secured a second source of auxiliary power units for Stage 2 vehicles because they can no longer get the same source as they supplied for the Stage 1 vehicles.

So that was an item on the MDL, for example.

ANTHONY IMBESI: What is the auxiliary power?

JOSEPH MARCONI: The auxiliary power unit is a device that is mounted on the roof that -- it takes the high voltage power from the

OCS and it converts it to three Phase 480 volt AC. It converts it to 120 volt AC and converts it to 26 volts DC to run other subsystems on the vehicle.

So basically it's just a huge power converter. It takes power from one source and converts it to power sources to operate and run other pieces of equipment on the train.

ANTHONY IMBESI: And is that component related in any way to some of the flash arcing that was experienced with the OCS during operations?

JOSEPH MARCONI: No. The flash arcing was on the traction equipment, I believe those were the line inductors from the traction supply.

ANTHONY IMBESI: So these items from the punch list through the MDL, the minor deficiently list, that work is being done by whom? Is that OLRTC that's performing the work to correct those?

JOSEPH MARCONI: No. Those are Alstom MDL items, so their production team works on those to get the vehicles in. Obviously the trains are running in service so they have to

find windows when the trains come in for, say, maintenance work and they can jump on board to correct those minor deficiencies.

ANTHONY IMBESI: Do you have an understanding then as to the contractual structure here? So obviously you have OLRTC and Alstom was a subcontractor to OLRTC, correct?

JOSEPH MARCONI: Correct.

ANTHONY IMBESI: And then there's Rideau Transit Maintenance, RTM, and Alstom is a maintenance subcontractor to RTM, correct?

JOSEPH MARCONI: Correct.

ANTHONY IMBESI: So in what capacity is Alstom performing these -- I mean, I'll call it "retrofits" but really I suppose it's just correcting the minor deficiencies. Is that work being done notionally through RTM or through OLRTC as warranty work?

JOSEPH MARCONI: It's not necessarily warranty work. If we're talking about MDLs it's the close of the MDLs, but in the warranty period. Technically the work is being done by Alstom Production. What I don't know, because I'm not on the ground to physically watch them do the work -- but I don't know if they -- if

they're using Alstom maintenance people, Alstom maintenance techs or workers to correct those deficiencies, those minor deficiencies. I don't know if they have their own team to do that or whether they're using the Alstom maintenance workers to do that work. That I don't know. As long as the work gets done, I guess, from my perspective that's what's important.

ANTHONY IMBESI: So you mentioned some challenges, if I can frame it that way, in terms of this work getting completed during operations because of train availability. Can you speak to that a little bit?

JOSEPH MARCONI: Sure. I mean, like anything, when a vehicle comes in for maintenance work or for some other issue, you know, you have to be sitting there ready with your resources and your parts and your work instructions to get out there in order to do the work. So I can see that being challenging on Alstom's part in order to get this done. And that's the only way I can see why it's taking them so long to get these MDLs corrected, is because they're finding it challenging to get access to these vehicles.

ANTHONY IMBESI: And I appreciate you said that you're not on the ground there, but have you observed any concerns with respect to the level of manpower that's being supplied to deal with these issues, both the maintenance and in terms of dealing with the minor deficiencies on Alstom's part?

JOSEPH MARCONI: It's hard for me to comment on something like that because without being on the ground, like I said, I don't know whether they got ten people doing the job or five or a hundred. So it could be a resource issue. I just couldn't tell you.

ANTHONY IMBESI: And when some of these items were passed from the punch list to the MDL following revenue service, was there anything on the list that was of concern to you in respect of reliability of the system, or potentially impacting on the reliability of the system?

JOSEPH MARCONI: Not necessarily. Like I said earlier, some of these vehicles had more than 30,000 kilometres on them by the time that -- by the time that substantial completion, trial running and RSA were being established.

So, you know, hindsight is 2020, I wish I knew today what I know from yesterday. I felt that the vehicles were in fairly good shape. We inspected all of them. Alstom had made all of those corrections. We went back and looked at the trains, they were in much better shape by the time RSA came around and I was confident that we were in good shape to go.

ANTHONY IMBESI: So just turning to the systems themselves then, is there anything unique about the Thales signaling system on this project?

JOSEPH MARCONI: I don't believe there is. I mean, Thales has worked with many railcar manufacturers, Bombardier, Siemens. They worked with other railcar manufacturers integrating their trade control system, I think even Rotem from Korea, they have worked with them as well.

So what is unique though is each vehicle has its own characteristics in terms of weight, aerodynamics, method of train control, manual train control.

So the real challenge is from a design perspective. I know I wasn't involved in that phase, but speaking from experience is -- how to

do proper integration and making sure that the architecture of one system can be melted in or combined with the architecture of another system.

And I have read, and I have copies of the interface control documents that were generated at that time between Alstom and Thales. And these interface control documents, they're fairly well prepared. So I think they got it down pretty good between both companies. But like anything, you know, certain things pop up, certain anomalies pop up, something that wasn't planned for or designed for. And you only learn that through static and dynamic testing, once you're trying to validate the performance of your systems and how they're working together.

And then it's a matter of refining and fine tuning and resetting certain time limits, and things like that. It's just massaging the software generally and, on occasion, sometimes the firmware and the hardware, but generally it's mostly software fine tuning to get them to work even better.

ANTHONY IMBESI: And I appreciate you

came into this project in 2018 so you weren't there from the outset. But having received the ICDs, and whatever other records that you received when you started your role, what was your sense in terms of how the systems integration had progressed to your arrival on the project?

JOSEPH MARCONI: Well, I think it progressed pretty good. There was, when I arrived in 2018, Thales had 10 or 11 vehicles that they -- already had their ATO system up and running, they had them D PICO and running. So 10 out of the 34 vehicles, they had one third of the fleet already under ATC control at that time.

So I thought it was -- it wasn't until I got onto the project and realized that it was a little -- it was late, according to the original schedules and timeframes. But to have one third of the fleet up and running and automatic train control already, I was quite impressed actually.

ANTHONY IMBESI: You thought it had progressed fairly significantly to that point, leaving aside the fact that when compared to the

original schedule it was delayed?

JOSEPH MARCONI: Yes.

ANTHONY IMBESI: Were you able to get a sense, from your review of any of this information, as to whether the system's integration was sufficiently planned for on this project?

JOSEPH MARCONI: I can only go by what documents I received. So, I mean, I looked at the interface control documents, like I said earlier, and I think they were fairly well prepared. And you could see that they had gone through some revisions so obviously there was discussions and meetings held before my time to reflect changes within the documentations.

I'm sure that Jacques would have held interface meetings between Alstom and Thales up to that point.

I also had to do one or two meetings after I got there with -- between Alstom and Thales. I think we met in Toronto at one time for a few days and those were just for the remaining items that needed fine tuning when I got on board.

So at that stage everything was going

as good as can be expected from a fresh guy coming in and trying to pick up the -- trying to pick up the pieces where everything was situated.

ANTHONY IMBESI: And so you mentioned that you participated in one or two meetings. Would you characterize those as interface meetings?

JOSEPH MARCONI: Yes. They were interface meetings in the sense that there was some interfaces that weren't giving the right characteristics or the right outputs for, say, Thales for example. So Thales was trying to get more insight on how the vehicle reacted and performed in terms of, say, transitioning from braking to propulsion, or vice versa. So this all had to do with timing issues.

And the relationship between Thales and Alstom, it wasn't easy from -- I could sense that it wasn't easy. They tried to remain co-operative but you have to remember that these are two companies that are competitors as well.

They both design and supply automatic train control, CBTC equipment. I'm sure that they're also trying to protect themselves and

not trying to divulge too much information, just enough to get the vehicle running and performing properly but not so much so that they would lose some of their technology, either verbally or even in writing.

So they were definitely careful with one another when trying to describe how their systems operated.

ANTHONY IMBESI: And I appreciate you would have observed that in a more limited way than, for example, Mr. Bergeron. But did you get the sense that there was any information that wasn't shared as between Thales and Alstom that should have been? Or were there any issues that manifested from this difficulty that they had dealing with each other, to a certain extent?

JOSEPH MARCONI: It's funny you say that because I did get a sense that sometimes they didn't want to share certain information, or the information they did share was just not sufficient for the other party.

But, you know, it's hard to say because you look at the train right now and it's working. I mean, it's -- it's not that far off.

And so was it an attempt to get more information than they really needed? That's hard for me to say because there are obviously some things deep down in each of the systems that I'm not cognizant of or an expert in. So to say whether enough is enough is sometimes very difficult to do in meetings like that.

ANTHONY IMBESI: And was there anything that sort of raised your suspicion that something that was requested might be a fishing expedition, or are you just indicating that just to explain that it's hard for you to really assess the level of information that's requested and required?

JOSEPH MARCONI: Well, I think there's one example, it's a simple example. There was -- in the Project Agreement there's a requirement that the event recorder, which is under Alstom's scope of supply, needs to record maximum speed.

So when I got on board Alstom made the request, through OLRTC, for Thales to provide this maximum speed variable, because the maximum speed is generated through the Thales system.

But what I learned was that that speed

is also recorded by Thales' automatic train control system, they call it "ATS", so the information is there. The City is aware of that information, they get that information. So there's no need for it to be recorded on Alstom's event recorder or EVR.

So we had a requirement that wasn't really needed to be met by Alstom. And I struggled a little bit to convince Alstom, you don't need that information on the EVR because now it's being recorded in two places. And since Thales is the master controller of that information it should only come from that source rather than being manipulated and changed and recorded as part of your EVR.

So there was -- and so to me there was a little bit of a -- I know it was a contract requirement for Alstom to have that information, but we told them that the City was okay with it and they would issue a change request not to have that on the EVR, which they did. But Alstom still tried to push the need to have that information. So I don't know if there was an ulterior motive to get that information, but eventually they came around and they stopped

making the request.

ANTHONY IMBESI: And just to tie off that line of questioning then, so out of any of the items that were deferred or remain outstanding to this day, do any of those relate in any way to any level of information sharing between those two parties?

JOSEPH MARCONI: Can you say that again please?

ANTHONY IMBESI: Of any of the issues outstanding, do they remain outstanding because of an inability to provide certain information as between those parties?

JOSEPH MARCONI: No. Because I think most of the issues have been resolved now. When I came on board, like I said, I think there were six or seven items that needed to be resolved and they have basically all been resolved as of today.

You know, I haven't got any recent requests from Thales for any additional information, nor have I gotten any recent requests from Alstom to get any additional information from Thales. So I believe all those interfaces are now behind us.

ANTHONY IMBESI: And turning now to the vehicle itself, that's the Citadis Spirit by Alstom, correct?

JOSEPH MARCONI: Correct.

ANTHONY IMBESI: And do you have a view, given your past rail experience, whether this was a proven vehicle? Would you consider this is a service proven vehicle?

JOSEPH MARCONI: I did a bit of research. I don't know if you call Wikipedia research because -- I've gone back and I don't see too many Spirit platforms out there. The Citadis name is out there on various other projects, but as far as the "Spirit" is concerned I don't see too many of those out there, other than Ottawa and maybe the Finch project now.

So I don't really have an appreciation for the -- what I would call the "percent reuse factor", like how much of the previous Citadis designs has Alstom taken from other service proven vehicles and incorporated them into the Spirit design?

To me -- like APU, for example, I don't think you will find any other Citadis

vehicles, other than the Ottawa one, that has the Adetel APU, for example. So obviously the return of experience from other projects to help the Ottawa situation was not there, at least from the APU standpoint. So I don't know off the top of my head, for example, propulsion or the braking system or door system, whether they have used those, or derivatives of those, on other projects. Unfortunately I don't have that level of detail or information.

ANTHONY IMBESI: And the APU, that's the auxiliary power unit you described previously?

JOSEPH MARCONI: Yes. For sure they have never used Additel before and I'm sure this is their fist attempt in using that supplier, and I think it backfired on them.

ANTHONY IMBESI: So do I take it then from what you've indicated to us that you've never had prior experience with an Alstom train?

JOSEPH MARCONI: Correct. This would be my first Alstom train.

ANTHONY IMBESI: And --

JOSEPH MARCONI: I did work with Alstom before in, China. But in China it was a

Bombardier train being built by the Chinese with Alstom automatic train control. So they were the Thales suppliers for the Beijing Olympics, 2008 Beijing Olympics.

So I was the vehicle supplier back then -- well, it was our designs, Bombardier, manufactured by the Chinese for us in China for the 2008 Olympics. And Thales were the subcontractors with the City of Beijing to install the automatic train control system. So I had some interfacing with them, but from a different perspective.

ANTHONY IMBESI: And to your knowledge, is this the first time a CBTC signaling system has been integrated with a low-floor LRV?

JOSEPH MARCONI: I don't believe so. I believe there are others out there in the world that have it. But I believe this might be the first one in North America with the Thales system.

ANTHONY IMBESI: And does integrating a CBTC system with a low-floor LRV, does that create any interface or technical challenges?

JOSEPH MARCONI: I don't think so. I

think up -- well, the challenges are, like I said earlier, fine tuning the integration work and making sure that both systems are harmonized. That can be challenging and take time. And it worked. I mean, it's possible. It just takes time and proper methodology to work through your issues and make sure that you understand each other's inputs and outputs.

ANTHONY IMBESI: Are there any of those challenges to work through that are unique to the fact that it's a low-floor LRV versus an LRV that is not low floor? I'm just trying to understand the distinction.

JOSEPH MARCONI: No. You're going to get those challenges whether it's a subway vehicle or a commuter-type vehicle, especially when you got --

-- TECHNICAL ISSUES --

ANTHONY IMBESI: Mr. Marconi, following the technical disruption there, if you could recall what you were saying in your answer, just to make sure it's accurately reflected in the transcript?

JOSEPH MARCONI: I think I was saying that it's no different than integrating a Thales

system or a train control system with any other type of vehicle in terms of commuter train or subway vehicle, high-speed train, for example, if that has it. It's just another -- it's just another type of mode of transportation.

And so integration, yes, there are challenges involved in that, but it's no different than any other vehicle integration.

ANTHONY IMBESI: Is there anything about the specific vehicle requirements for this project that made integration more challenging?

JOSEPH MARCONI: I don't think so. I think more so -- I think in my mind when I came on board and I looked at what was going on and -- to me I think it was more the vehicle selection. Like, why LRV? I think that question was more in my mind rather than -- if they wanted LRV that's fine, but I don't think that LRV was the right choice for that type of system. It's an LRV. It's a streetcar. So you're taking a streetcar and running in tunnels, and underground and elevated stations and stuff like that. This vehicle was designed basically for picking up passengers on the street.

So was it the right technology? I don't know. I mean, I think the last 10 or 15 years -- it's like the Tesla, everybody wants a Tesla, right? So maybe they wanted the prestige of having an LRV. But is it the right technology for the application? I question that more than probably anything.

ANTHONY IMBESI: And so what are the characteristics about the LRV technology that might make it unsuitable for that application?

JOSEPH MARCONI: Well, I mean, all the equipment is mounted on the roof of the vehicle, so it's got a higher centre of gravity, which means that in curves and things like that it's not generally as stable as, say, a subway car where all the equipment is mounted underneath the vehicle and the centre of gravity is a lot lower.

Also from a maintenance perspective, or even a train recovery perspective, I mean, if you're out on the main line and have a failure and all your equipment is on the roof, how do you get up there to fix it? Yeah, you can go on the laptop and see if you can get it to work from inside the car by plugging in through an

electrical port, but if you have to do something on the roof how do you get on the roof? You need a ladder or a sky hook to get on to the roof. On a subway car you get on the track and get under the train and work on it there.

Even in the operations and maintenance facility, MSF, I mean, you have to have catwalks and walkways, and things like that, in order to access the equipment on the roof. So from a maintenance and as well as an emergency recovery perspective, I don't particularly favour LRV for that type of system. Great for the street, low level entry, people need to get on board, you don't need fancy platforms and fancy stations.

And whatever -- you're intermixed with traffic and things like that, those are obviously concerns, but you have a dedicated guideway for an LRV and a full ATO capability with a driver. I mean, this vehicle is capable, truly capable of running all by itself, yet we have a driver. That's mystifying in my mind.

ANTHONY IMBESI: And so when you're talking about the LRV it's -- the primary attraction, I suppose, is when you're dealing with it, for example, on the street because it's

accessible without a platform, is that because it's a low-floor type vehicle?

JOSEPH MARCONI: Correct. Yes. It's easy for people to get on board and get on-and-off the train.

You look at what we've done -- when I was at Bombardier we did the Flexity vehicle. All their previous streetcars were a few steps up to get onto the vehicle and you're prone to tripping and falling as you're entering and exiting the vehicle. It's a lot easier for people to get in with wheelchairs, easy to lift with a ramp. So the technology is big if you're running in mixed traffic on the streets. But on a dedicated alignment with no mixed traffic -- this vehicle even has turn signals, and I don't know why it has turn signals because there's -- it's on a dedicated alignment and the tracks go one way. There's no left or right turns, it's following that track no matter what. So is it the right technology? I don't know.

It's beautiful technology, don't get me wrong, but is it the right one for Ottawa? That's -- in my mind that's what I would probably question the most.

FRASER HARLAND: Are there issues related to the LRV as the chosen vehicle and the speed that's required in Ottawa in your view?

JOSEPH MARCONI: I don't think so. I think, you know, I think in the Project Agreement there was a certain requirement for meeting round trip travel times and the number of passengers that it had to carry per direction. And, you know, the vehicle is capable of doing that and tested -- and tested to prove that.

But -- so, you know, it can meet those requirements, there's no question about it. But, again, is it the right technology for that application? I don't know.

ANTHONY IMBESI: And I appreciate you weren't there at the start of the project, you had no involvement in the negotiation of any of the contracts. Are you familiar with the provision in Alstom's subcontract that required OLRTC or Thales to deliver a finalized CBTC design by April 2013, which was a few months into the project?

JOSEPH MARCONI: No. I'm sorry, I'm not aware of that. It was way too early for me.

ANTHONY IMBESI: Would that be practical in a project of this nature?

JOSEPH MARCONI: Well, okay, that's a good question. When it comes to interfaces with -- normally the CBTC system equipment is what I call "plug and play", which means that there's a rack, an electronic rack, and on the back of the electronic rack you have interfaces that tie into the electrical equipment that the vehicle manufacturer, Alstom, would provide.

So when it comes to interfaces those are the interfaces that would be critical to having available, equipment having available to get those connections made. As far as the equipment sliding in and connecting to those racks, that's not so critical because it's going to be a long time, maybe not a long time, but months later after you assemble the vehicle that you need that equipment in order to start your static testing and your dynamic testing. That's when you need the brains of the system.

But those interfaces, where they connect to the vehicle architecture, to the vehicle wiring, to the vehicle structure, those interfaces need to be finalized first.

So since I wasn't involved in the early-on stages of the project, obviously I'm not aware of what came first or what came second, but from a design or historical perspective I'm telling you those are the stages that are critical when it comes to building a vehicle and having those parts available to make those connections.

ANTHONY IMBESI: So when you did arrive on the project in August of 2019, how were the Alstom and Thales schedules aligned?

JOSEPH MARCONI: I believe they were -- they weren't too bad. I mean, I do recall when I did arrive, I think it was a couple months after I arrived, it was near the -- Alstom was finalizing the production of their last two vehicles, and what they found out was that they didn't have -- they were missing some of the Thales equipment I recall.

And there was a list generated of what was missing. And I think they were missing because the equipment had been -- all the equipment was there but either through installation or through testing the equipment had failed, so it was removed and replaced with

another brand new one. But the failed units were never sent back to Thales for repair, or if they were sent back to Thales for repair Thales didn't repair them right away.

So there was a big scramble between October -- September and October of 2018 to find all this missing equipment. I think by mid-September they had located it all. They knew exactly where it was. But I think there was four or five pieces of equipment that Thales had to fix, test and then send back to Alstom. And I believe Alstom got that equipment sometime in mid-December.

ANTHONY IMBESI: So aside from the issue with the equipment then, did you feel that the Alstom and Thales schedules were generally on par in terms of what was required from each of them to have things move forward?

JOSEPH MARCONI: I believe so, yes. From what I could see, from my vantage point I believe that they were on par. I kind of really, you know, not that I don't really follow schedules, but my major focus was the technical aspects of the job rather than the schedule aspects of the job.

ANTHONY IMBESI: Right. But I guess it's fair to say that there wasn't something critical missing from one of the parties that the other expected to be there for them?

JOSEPH MARCONI: Other than those pieces of equipment near the end, I can't recall anything prior to that or even after that. Once that was delivered I believe we were up and running on Stage 1. And I think even when we started Stage 2 there was a bit of delay getting some of the parts.

But I don't think that really impacted Alstom that much. They were still building that vehicle. Did they really need the Thales equipment right then and there? They were still producing -- they still had their own production worries to get through.

ANTHONY IMBESI: And so at the time then that you arrived in the project was the LRV production, or assembly, and the testing that was planned to have gone on, that was behind schedule?

JOSEPH MARCONI: Yes. I believe it was behind schedule. Because I think the original -- from when I got on board, I think

the -- from what I remember there was -- there was talk about having substantial completion and ready for RSA, and all that activity to take place, I think it was May of 2018.

So when I got on board, you know, I think the schedule was at least three to four months delayed right then and there because we had missed substantial completion in May of 2018, three months before I had even arrived on the doorstep. So obviously the schedule was late.

ANTHONY IMBESI: And did you have any insight as to what those delays were?

JOSEPH MARCONI: No. I'm sorry, I don't. At that particular juncture -- at that particular time I was just trying to get my -- I was getting my feet wet trying to figure out where everything stood and who had what and how I was to interact with all these different people, all these new people and companies. So that was basically my challenge, in August, September and October, is just trying to get myself wrapped around the design and the issues and trying to move things forward as best I could.

ANTHONY IMBESI: So in those months following your arrival were there any production or assembly delays of the LRVs, or any issues with the signaling system in terms of delayed provision of anything?

JOSEPH MARCONI: As far as the signaling system was concerned, I don't know anything much about the Wayside equipment, that was mostly handled by Matt Slade.

I was generally involved just on the vehicle side. So in terms of production delays we would have somebody go through, I recall on a weekly basis, and go through Alstom's production line with them. And I think even sometime the lenders were there. And then we would report on their weekly progress week-by-week.

And I think that information was sent along to Sharon Oakley, and she would forward that information on to people within RTG and OLRT at the management level just to give them a week-by-week synopsis of how things were progressing on the MSF floor in terms of Alstom production.

ANTHONY IMBESI: And who would be the one who was going through the production with

Alstom? I think you mentioned one individual and additionally a lender representative.

JOSEPH MARCONI: The person that was initially going through, it was a gentleman by the name of Neil McDermott. I think he was under contract by OLRTC, and I think he was on the job until -- when I got there he was there and I think he stayed until December of 2018.

And then after that Jean Louis Ozorak took over Neil's position and then he became the quality manager. And he did the weekly walk-throughs with Alstom and then reported his findings to Sharon, which included percent completions in each of the stations.

And if there was any issues or if they were missing any parts, it was basically a weekly synopsis of what was happening on the MSF floor.

ANTHONY IMBESI: You mentioned that that information was provided to Dr. Oakley for her to do with it what she was required to do. Was that information that was relevant to your job performance, or were you not necessarily concerned with the minutiae of how the assembly and production was proceeding?

JOSEPH MARCONI: Yeah. I read it and I scanned through it just to see if there was any of the impacts of what I was doing. But, generally speaking, in terms of what I needed to get done, in terms of inspecting the vehicles, provisionally inspecting the vehicles and making sure we got completion of any type testing, qualification testing, so to speak, any integration issues that needed to be resolved, that was my primary focus rather than how things were going on the production line.

Obviously if there was something that they wanted me to do or get involved in I would be open to that, but I don't recall much involvement in that.

ANTHONY IMBESI: And you've mentioned for us a number of different types of testing. And we've heard reference to a few different types. Could you just explain some of these types of testing? You mentioned "component testing". What is component testing?

JOSEPH MARCONI: Component testing is basically individual testing of an item. For example, I'll use the APU again, for lack of a better choice. But a component test would be

something that Alstom's subcontractor would be doing to validate the performance of their equipment at the component level.

So either they send that equipment to a lab or they would send that equipment -- or they would keep that equipment in-house and test it for water infiltration, or for noise that it may generate, or how much heat dissipates from it while in operation. So they would run their own individual component-level testing. All of the major pieces of equipment would have their own component-level test.

ANTHONY IMBESI: And would all of that have been completed prior to your involvement in the project?

JOSEPH MARCONI: Correct, yes. So normally what happens is you have your component level testing, all the reports and documents regarding the passing of those testing would have been submitted to OLRTC and then on to the City.

They would -- questions would go back-and-forth until a resolution of all those questions was obtained. And then they would probably do a first article inspection where

they would go and inspect that piece of equipment for quality of workmanship, things like that.

And then eventually, once that was done, the equipment could then be shipped to the assembly facility.

ANTHONY IMBESI: So all of that had been completed prior to your involvement. Were there any concerns arising out of the component testing that were still being addressed?

JOSEPH MARCONI: You know, to be honest with you, there was -- out of all the components there was what we call "CRE" or "CRI" sheets that were generated between OLRTC and Alstom and the City and the City's consultants. Because I think the City had consultants reviewing most of these test reports. So to say that there wasn't any issues, I believe there was some open issues, open questions. How many? That's a good question. Off the top of my head I can't remember, but there definitely had to be some questions that still hadn't been resolved in regards to component testing.

ANTHONY IMBESI: Anything of significance that you can recall?

JOSEPH MARCONI: I'm sorry, I can't recall anything specific that jumps out into my mind now, no.

ANTHONY IMBESI: And you also mentioned "type testing"?

JOSEPH MARCONI: Yes.

ANTHONY IMBESI: Just give us a brief explanation as to what that is?

JOSEPH MARCONI: Generally type testing would be like a one-off test. And component testing can be a type test as well.

So basically a type test is a test where you only do it once. Like, for example, a climate room chamber test, which was done at the NRC facility for this vehicle.

And so they would do that test once to prove the heating and cooling capability of the vehicle. So that would be a type test, for example.

ANTHONY IMBESI: And would that testing have included the actual performance or functionality of the vehicle in those conditions, or was that strictly related to the heating, cooling capabilities?

JOSEPH MARCONI: It's a static test,

so the vehicle is put into a -- you know, a closed chamber that can simulate heat and cold, and so the vehicle is not running dynamically. So that's just simulating the capability of the HVAC system to keep up with the thermal loads that are imposed on it, whether it's summer or winter conditions.

FRASER HARLAND: Is type testing another word for validation testing? Are those used interchangeably?

JOSEPH MARCONI: You could use them interchangeably, as well as qualification testing. So you're qualifying something, you're validating something, you're type testing something, all those terms are kind of synonymous.

ANTHONY IMBESI: And I also understand then there's serial testing, both static and dynamic. Could you explain those for us as well?

JOSEPH MARCONI: Okay. An example of a series test is each vehicle would have to go through a propulsion and braking test.

So the vehicle would be put out on the main line and run at certain speeds and you

would have to make sure that after you apply the brakes you stop within a certain distance. And then you validate and measure that distance to make sure that the brakes were stopping correctly and not exceeding thermal limits or thermal temperatures of the brake disks or the brake pads.

Acceleration performance, so putting the train at a certain notch on the master controller that it could go 40, 50, 60 kilometres per hour within a certain timeframe. So all these tests, the acceleration curve and the deceleration curves were all plotted. Jerk brakes, for example. How -- when the vehicle brakes at the end it doesn't cause any excessive jerks so that it prevents people that are riding the train from stumbling and falling over because of the braking is too abrupt. So all these things are done as a form of series tests.

ANTHONY IMBESI: So series tests, those are things that are performed on each LRV?

JOSEPH MARCONI: Correct. It can be done on a component level too. So a component level could have a series test as well as the entire vehicle.

ANTHONY IMBESI: Right. Just meaning it's done on each and every LRV as opposed to a one-off, if you're just dealing with testing one component to make sure it generally --

JOSEPH MARCONI: Exactly.

ANTHONY IMBESI: And then of those, the static, are those tests that are undertaken when the train is not in motion, for example, in the MSF facility?

JOSEPH MARCONI: Correct. And the manufacturing facility, the static ones, the trains is not in motion. And the dynamic ones, the train is in motion.

ANTHONY IMBESI: And is there any distinction as to what is tested? And I appreciate you're performing test that are required for the LRV to be in motion, but when you're dealing with the static test does that include any elements of the signaling system?

JOSEPH MARCONI: Yes. Once the vehicle is completed by Alstom and they've validated their own static and dynamic tests, then the vehicle is handed over to Thales and Thales then perform static as well as dynamic testing of their systems.

ANTHONY IMBESI: So it's a two-part process. Alstom would undergo the static and dynamic testing of their component, being the actual LRV, and then it would move on to Thales to perform static and dynamic testing with respect to their signaling components?

JOSEPH MARCONI: Exactly.

ANTHONY IMBESI: And is that what's referred to as the "static and dynamic PICO tests"?

JOSEPH MARCONI: Yes.

ANTHONY IMBESI: And that's when those tests are performed by Thales, is when they're referred to by PICO?

JOSEPH MARCONI: Yes. S PICO and D PICO.

ANTHONY IMBESI: Post integration check out?

JOSEPH MARCONI: Correct.

ANTHONY IMBESI: In there as well -- is there a provisional acceptance test that is undertaken?

JOSEPH MARCONI: There's a provisional inspection. So as part of the provisional inspection we visually inspect the vehicle, this

is something that OLRTC does. We inspect the roof, we inspect the undercars, we inspect the sides, we inspect the interior, we inspect the cabs. And as a subset of that we also -- at least on Stage 2, we run certain static verifications to make sure that some of the safety things are working properly, like the bell, the horn, the communication system, the interior communications that -- the PA.

So there are certain static validations that we do as part of our provisional acceptance testing and inspection.

ANTHONY IMBESI: And is that something that's performed -- that's just by OLRTC?

JOSEPH MARCONI: It's OLRTC's event, but it's supported by Alstom.

So, you know, they basically run, they turn the switches, they run the test and we sit there and observe. And in some cases we may sit in the operator seat and we'll turn on the air conditioning, or we'll turn on the interior lights, or whatever. So we sit in the cab seat and we run through certain static checks with Alstom in attendance as part of that provisional acceptance process.

ANTHONY IMBESI: I guess what I was getting at, this isn't provisional acceptance by the City of Ottawa or the end client. This is the provisional acceptance by OLRTC?

JOSEPH MARCONI: When Stage 1 was done it was done with only OLRTC. However, when Stage 2 was done I, as part of my procedure, because I had to write a procedure for Stage 2 because there was none for Stage 1, I actually included the City to be part of that. I invited them; they can either attend or not attend.

But in Stage 2 that's what I did. I invited the City. They could participate with OLRTC to do the provisional acceptance with us, if they wanted to come or not. But in Stage 1 the City was not there.

ANTHONY IMBESI: What was the benefit, or what was the reasoning for having the City involved in the Stage 2, provisional acceptance testing stage?

JOSEPH MARCONI: I guess the more eyes, the more ears that you have the more things you can find and catch. We didn't want to get into a situation where OLRTC went through it, we think we caught everything and then all

of a sudden we get to the stage where, holy smokes, the City saw this or they encountered this and we missed it.

So I kind of learned my lesson when we went through the final acceptance process of the Stage 1 vehicles, that's where the City was involved. And I found that to be a real benefit to have all the stakeholders involved.

So I guess it's a good thing as part of a P3, so that we would all come to the same conclusion that, yeah, that really is an issue or no, that's not really an issue and let's move on. So it broke down any barriers that may have presented themselves on Stage 1 versus Stage 2. I didn't want to go down that route on Stage 2.

ANTHONY IMBESI: Is it because the City's input as the operator is of assistance to you?

JOSEPH MARCONI: Sure, it's important. Who knows their people or their drivers better than them? So as operators, at the end of the day, they have to be comfortable with the process, they have to be comfortable with what they're getting. And the sooner you know they're not comfortable with what they're

getting then the sooner you can react to find solutions to either mitigate the problem or fix it.

ANTHONY IMBESI: So did you feel that the City, in hindsight, should have been involved earlier in that process as the end operator?

JOSEPH MARCONI: They could have -- you know, hindsight is 20/20. But Jacques had gone through twenty vehicles that way so I carried on with that process, the provisional acceptance portion anyway, for the remaining six vehicles or so, seven, eight vehicles. So anyways, it is what it is.

And I decided that it would be a benefit to do that on Stage 2 so that's what I did.

FRASER HARLAND: If I can jump in? Do I understand correctly that provisional acceptance was not originally part of Alstom's requirements and that was added part way through the project? Do you know anything about that?

JOSEPH MARCONI: No. I'm not aware of that at all and I don't recall. When I got on board that was provisional acceptance at that

time, and Jacques was doing it, he did twenty vehicles. We would get a safety cert from Alstom at that time. We would get the Canadian content form and we would get the keys to the vehicle, two keys to the vehicle once the provisional acceptance was finished.

ANTHONY IMBESI: So following provision inspection or acceptance you then spoke about final acceptance.

JOSEPH MARCONI: Yes.

ANTHONY IMBESI: And that's the procedure you described earlier where the City was involved, you went through the vehicles, and ultimately the punch list, and the MDL was derived from what came out of those inspections, for the purpose of the final acceptance test?

JOSEPH MARCONI: Yes. You got that right.

ANTHONY IMBESI: So we're about half way through so perhaps it's now a good time to -- we'll take a 15-minute break.

-- RECESSED AT 10:28 A.M. --

-- RESUMED AT 10:45 A.M. --

FRASER HARLAND: Mr. Marconi, related to final acceptance, I understand that there

were two different sets of final acceptance certificates that were signed with Alstom, does that ring a bell with you at all?

JOSEPH MARCONI: Yeah. I recall that issue but I think the first one was done in error.

FRASER HARLAND: Can you just explain that issue a little by more for us, please?

JOSEPH MARCONI: My memory is a little bit foggy on this one. I think I signed the certificates but I shouldn't have signed them because we hadn't completed everything at that time, if I recall correctly. I'm sorry, I just can't remember what transpired. But I do recall there was some confusion about final acceptance and either the signing of the certificates prematurely. Sorry, I can't help you there right now.

FRASER HARLAND: That's helpful, thank you.

ANTHONY IMBESI: Mr. Marconi, were you aware that the initial plan was for the assembly of two prototype vehicles, first in France and then in Hornell, New York, and that was subsequently moved to be conducted in Ottawa?

Are you familiar with that?

JOSEPH MARCONI: From my understanding, when I got on the project, I'm not sure about France, but I think the first vehicle came out of Hornell, New York. That's my recollection, but I could be wrong. I'm not sure if it was two vehicles or one, but I'm pretty sure they came out of New York instead of out of Europe.

ANTHONY IMBESI: And just in respect of the two prototype vehicles, do you have any knowledge or opinion as to whether any of the validation or other types of early testing that would normally be done on the two prototype vehicles were done prior to serial production in the way it was planned?

JOSEPH MARCONI: No. I wouldn't have any recollection of that. I wasn't involved so I don't know what came first at what stage, sorry.

ANTHONY IMBESI: Thank you. And so turning now, I'd like to speak a bit about some of the retrofits that I understand took place on the vehicles. Were there a number of retrofits that were undertaken during your time on the

project?

JOSEPH MARCONI: Yes. We were meeting with Alstom on a weekly basis. And they were doing some retrofits either on, you know, the cab doors for example, putting the plastic ones in or they were doing retrofits on their brake equipment, the hydraulic pump units that were failing, either changing spool valves or solenoid valves. So there was retrofits going on, and most of these retrofits were coming out of the -- I would say -- because the vehicles were being exercised and run and tested on the alignment, they were getting used. And some of infant mortality problems were coming out, or maybe there was design issues.

So things were failing, and as they were failing Alstom was investigating and -- in determination with their suppliers that these items, these components needed to be repaired or replaced.

And so, yes, there was a retrofit exercise going on as we were -- as they were building and as we were testing, all in parallel.

ANTHONY IMBESI: So you mentioned the

hydraulic power unit, were these some fairly major components that were failing or having issues requiring fairly extensive retrofits? Or how would you characterize that?

JOSEPH MARCONI: A hydraulic power unit is, in my opinion, a fairly major piece of equipment. It's what transmits the command or the demands for braking to the bogies to say, apply or release the brakes. So that's definitely a safety consideration.

So, as I said, I think the hydraulic pump unit had gone through -- at least when I was there, at least four or five different modifications.

And there is documentation out there that Alstom retains, what they call "FMIs", field modification instructions, they're actually quite well done by the -- by Alstom subcontractor, Wabtec because they -- whenever they release it they -- it contains all the history of all the modifications that were done to that particular piece of equipment. So you can see the full history, the full gamut of changes from day 1 in terms of what they did and when they did it.

ANTHONY IMBESI: And so in addition to the HPU, do I understand there were also issues with brake calipers, or is that a related component?

JOSEPH MARCONI: It's another piece of equipment as part of the brake equipment, the caliper is mounted on the bogie. Those calipers, they have the brake pads, it's the same as the brake caliper on your car. They squeeze brake disks when hydraulic oil is actually removed because it's a spring-applied hydraulic release system for fail-safe application.

So they had some issues with their calipers, and I believe they had some corrosion issues with their calipers. And I think they had some issues where the calipers wouldn't release properly, they would get hung up and cause like a dragging brake.

ANTHONY IMBESI: And were both the brake caliper issue and the HPU issue, were those ultimately resolved in a satisfactory way?

JOSEPH MARCONI: Yes, they were. They were fixed and the corrections appear to have been taken correctly, yes, as far as I'm

concerned.

ANTHONY IMBESI: And I think you had already mentioned the APS, the auxiliary power supply unit?

JOSEPH MARCONI: APU.

ANTHONY IMBESI: APU?

JOSEPH MARCONI: APU, APS. They call it CVS sometimes in French which I don't know what the French words are but they call it CVS sometimes.

ANTHONY IMBESI: And was that also an item that had to undergo a retrofit campaign to address --

JOSEPH MARCONI: That was more of a major one in terms of retrofit because, you know, for one thing we didn't know the root cause of why they were failing. I think eventually Alstom did provide a report to us and I think that went to the City to indicate, you know, the components within the unit, why those components were failing. I think Alstom had some difficulties with their subcontractor there, Adetel. And I think it came to such a point that Alstom set up their own work cell in the Brampton facility in Toronto to repair their

subcontractor's equipment.

So they hired somebody or they had somebody that had the technical knowledge and know-how, and was getting the parts that needed to be replaced and taking equipment and repairing them in Brampton.

ANTHONY IMBESI: And was that issue ultimately resolved to your satisfaction?

JOSEPH MARCONI: Well, I don't know if it's -- I still believe it could be a ticking time bomb out there. I don't know if it's all been fully resolved yet. I think Alstom's under the impression that as they're running maintenance or as they were doing the warranty on this thing, if things were to happen then they're going to -- they've got enough spare parts out there to try and fix any ones that do fail.

But personally I think -- I still think that they may not be robust enough. So what Alstom has done is they have gone to a secondary source. They have gone to another supplier, ABB, which I have more confidence in because I have worked with ABB in the past, they're a pretty good supplier of equipment.

And we're in the process right now of trying to qualify a secondary source. We don't know which vehicles, Stage 2 vehicles, those APUs are going to go on the ABB APUs, because Alstom has not told us yet. But we know that it's on LRV43 and I believe LRV44, so two of those vehicles. But none of those units have entered service yet.

So everything in service currently has Adetel -- mostly repaired Adetel equipment on it.

ANTHONY IMBESI: That you say could potentially still could be the ticking time bomb?

JOSEPH MARCONI: I still think there could be some issues there that will cause them to fail over time. Maybe not immediately, maybe a year or two down the road, maybe five years down the road, I don't know. But I just -- I just have a gut feeling that -- it's just my perception that I don't think we're over with that issue yet.

ANTHONY IMBESI: And would that be something that was noted in the punch list and the MDL?

JOSEPH MARCONI: Yes. That's -- it's definitely in the MDL. And I can't recall if it's in the punch list as well, but I think it was initially on the punch list on Stage 1. So I'm not sure if we carried that forward on Stage 2, but I'm pretty sure it was on the punch list as well.

ANTHONY IMBESI: And just in terms of major other issues that we heard reference to, was there any issue with the line contactors? I know earlier today we spoke about the overhead catenary system.

JOSEPH MARCONI: Yes. There was issues with line contactors and line inductors. Line contactors I think had gone through three or four different iterations of that equipment. It appears to have stabilized now so I've got a little bit more confidence in what's they have got right now on the vehicles is fit for use. I haven't heard of any recent failures in that respect. So, yeah, it's another item that Alstom had some issues with.

ANTHONY IMBESI: Would that be something that was also noted in the MDL?

JOSEPH MARCONI: Yes, I believe it

was.

ANTHONY IMBESI: And is it this specific issue that has caused, to your knowledge, the arc flashes?

JOSEPH MARCONI: They can cause flashes but I think there's a cover on them. There is an enclosure on them. I think it's the -- if I'm not mistaken I believe it's the line inductors that were on the propulsion equipment cases that caused the flash-over and the arcs. Because I think the line inductors were not protected properly, the cover on them was not sufficient enough to prevent water ingress. And I believe the insulation on these line inductors, they're basically huge coils that sit inside the propulsion equipment cases, and I think the insulation material was not appropriately applied. And the -- once these line inductors got dirty with soot and grime, and got wet, because water was in there, they arced over and grounded themselves against any adjacent metal that they could find. So I think the arcing issue was generally due to the line inductors.

ANTHONY IMBESI: And you had mentioned

the door release mechanism, emergency door release mechanism, was this an item that was subject to retrofits prior to RSA?

JOSEPH MARCONI: Yes. That's another item that Alstom had issues with, EDR. I recall at least two problems. One where they -- when EDR was not activated, would not open the door. The door would remain basically -- it would open slightly but it would not be allowed to completely open up. And sometimes -- in some cases it actually closed on itself.

So they had some issues, I believe, with the assembly of the EDR itself. They added -- there was a grommet, there was some device inside the EDR that was preventing it from doing the full release so they had to redesign that.

And there was another issue later on, I think this is after revenue service started, where a passenger pulled the EDR between two stations and the doors actually opened and allowed the passenger to extricate himself from the vehicle, and that shouldn't have happened.

The EDR -- when it's a certain distance beyond the platform the EDR will

activate the door, open it slightly but not permit the passenger to open the door completely until the vehicle arrives at the next station for safety implications, you just don't' want passengers between stations walking around.

They had to do a retrofit of that, I think they had to do some revised circuitry for that particular modification.

ANTHONY IMBESI: So in terms of the retrofit that was done with respect to that issue prior to RSA, is it your view then that given what happened during operations that that matter wasn't fully rectified prior to revenue service, or is that a separate issue?

JOSEPH MARCONI: It wasn't recognized. There was something that wasn't recognized prior to revenue service. So there's things that happen, there's failures that can happen that -- and I think it's normal in the industry that failures can occur after a vehicle is accepted, after you have gone through all your testing regimes, all your checks and balances and something does happen and you go, oh, this was missed. And it does happen.

ANTHONY IMBESI: And so when these

different issues that you've discussed are being discovered, are they typically discovered through the testing process at different stages of testing?

JOSEPH MARCONI: Yes, so they can be discovered almost at any time, I mean either through testing -- or even through, you know, static testing or dynamic testing things don't give you appropriate results after you test them. And then you drill back or do a root cause analysis and determine that the cause of that failure of the test is a result of either equipment failure or some parameter being out of tolerance. So, yes, you know, a lot of things can be found through a testing regime in terms of finding deficiencies.

And sometimes just equipment it just fails. I mean, a light bulb goes out and it just happens. You've tested it, the light bulb worked the day before, you test it the next day and the light bulb doesn't work.

ANTHONY IMBESI: So when some of these issues are discovered during testing, at whatever stage of testing it might be, Alstom, or whomever is responsible, has to undertake a

retrofit, in what circumstances then will the vehicle have to be retested?

JOSEPH MARCONI: Um, I guess in cases where you know if it failed during that particular test then -- and you'd have to repair the equipment and then retest that portion of the test after the repair. So in cases like that you could also have cases where, you know, you have where Alstom is finished all their testing, they handover the train to Thales, and then all a sudden you have an equipment failure of braking or propulsion while Thales is testing the vehicle, which means the train has to go back to Alstom, they have to do the repair, which could dictate Thales having to retest their test because of failure of Alstom equipment.

-- [TECHNICAL ISSUES] --

-- RECESSED AT 11:02 A.M. --

-- RESUMED AT 11:05 A.M. --

ANTHONY IMBESI: So in terms of the retrofits prior to the technical issue, we had

spoken about, how in certain circumstance once retrofits were completed the LRVs had to be retested.

So I guess what I'm driving at is, did the necessity of Alstom having to undertake a number of these retrofits, did this impact or delay the testing and commissioning of the LRVs, whether just by virtue of retrofits having to be performed, and that taking time, or by virtue of any of these retests having to happen? Was the testing and commissioning delayed as a result of these retrofits?

JOSEPH MARCONI: I would have to say yes, but I don't know the scale of the delay. I mean, I was tasked basically to try and get them to get these retrofits done as quickly as they could so we could get into the final acceptance of the vehicles, get to substantial completion. So, yes, I would say it must have had been impact in terms of getting to that stage. How much of an impact it had, I can't tell for sure.

ANTHONY IMBESI: And just to orient us with the process and where it was at during this time, so at the time that these retrofits were being undertaken, was the initial assembly of

the entire fleet completed?

JOSEPH MARCONI: No. When I came on board in August they were already into the retrofit program on some of the trains, and that carried on well into December or January of 2019, this retrofit program. And at that particular juncture there were still a few cars that needed to be assembled.

As a matter of fact, I also recall that LRV 2 and LRV 8 actually had to be pulled out and renumbered as LRV 35 and 36. What Alstom did is they took two Stage 2 vehicles -- they were along on Stage 2 vehicles more so and could get them to be part of Stage 1 rather than completing the work they had to do on LRV 2 and 8.

So Alstom still had some challenges in terms of getting the cars completed and manufactured in spite of the retrofits going as well, so all that was happening parallel. But they had to steal two vehicles from the Stage 2 supply in order to make up the 34 vehicles for Stage 1 delivery.

ANTHONY IMBESI: And was that because vehicles 2 and 8 just weren't sufficiently

progressed in terms of assembly or were they LRVs that were undergoing such significant retrofits that it was easier to bring in two Stage 2 vehicles? I just want to understand that.

JOSEPH MARCONI: LRV 2 was used for a lot of the major qualification testing in terms of load weight testing, where they put sand bags up to AW3. So it was in no condition -- it had sand all over the inside of it. It had no interior. It was basically a test train that was gutted in order to perform their braking -- dynamic braking and propulsion testing from a type testing perspective, and other test as well. So that test -- that vehicle was a test train and so it had a lot of work needed to be done on it.

LRV 8 was a train -- I think they were taking parts off of it. I'm not sure what happened during the production phase of it because I wasn't there during that timeframe. But I think they started taking parts and components off of it and using them for other trains to keep production going somewhere else. So it became kind of like a -- like a train that

got left there with a number of parts missing. They figured it was easier to carry on with the Stage 2 delivery rather than rebuild and bring number 8 back to life.

ANTHONY IMBESI: So -- and the parts that were taken -- that were taken from LRV 8 were those used to complete or retrofit other Stage 1 vehicles?

JOSEPH MARCONI: I believe so, yes.

ANTHONY IMBESI: And as a result LRV 8 was not in a state to be delivered as a functioning vehicle?

JOSEPH MARCONI: Correct. So they -- we renumbered then to LRV 35 and 36, and those vehicles still haven't been delivered yet, that was part of Stage 2. We started with vehicle 37 and 38, so there's two vehicles -- the first two vehicles of Stage 2 that are still, as of today, still in limbo.

ANTHONY IMBESI: And so -- and how would the retrofit work proceed? I mean, would Alstom be delivering some type of retrofit plan with a progression or schedule?

JOSEPH MARCONI: Yes. Correct. We met on a weekly basis. I believe Matt Slade was

in that meeting, Rupert was in the meeting, me. I was there, Alstom was there, Betrand Bouteloup was there, Alexander L'Homme.

So we would meet on a weekly basis, I believe it was a Wednesday. And Alstom would present their schedule, where they planned to be the following week and the week after that. But I think their target was to have at least 30 vehicles available for trial running and revenue service. I think it went up to 30 vehicles at that time in terms of the schedule, I think that's what their plan was. And those files exist somewhere, those presentations from Alstom showing the progression week-by-week.

ANTHONY IMBESI: So when Alstom would present OLRTC with a plan and an initial schedule to complete these retrofits, was it your experience that the retrofits generally proceeded in accordance with that schedule, or was Alstom delayed in delivering these retrofits as well?

JOSEPH MARCONI: No. They were delayed in delivering the retrofits as well. There's all sorts of reasons. There's parts reasons or they still didn't know what they

needed to do yet or they were still investigating, or things like that. So there was -- the vendors had to set up shop in order to fix the parts, things like that. So sometimes things took a little bit more time than originally planned. I think at one time they even brought -- definitely they brought the door supplier in to do some of the retrofits, and even the brake supplier to do the retrofits right at the end rather than sending equipment back up to get repaired. Because it was easier for them to control the equipment being repaired locally rather than losing things and losing time shipping things back-and-forth.

ANTHONY IMBESI: And so you've talked about the retrofits and delays to the retrofits, and you've also spoken about how there was some production left to be done in terms of getting the full compliment of trains.

And was it your view of this that Alstom, having to proceed with all of that together impacted their ability to deliver all of this in a timely manner?

JOSEPH MARCONI: I would say, yes. I mean, it's quite a -- it's quite an endeavour to

manage all of that effort. So and you have all these subcontractors that you have to deal with and get resolution from them as well.

And so, yeah, I would think there's definitely an impact in terms of getting all these trains ready.

Because, you know, you're building at the same time, you're retrofitting, at the same time, you're testing at the same time, things are still failing. So you get into a bit of a vicious circle as the vehicles are being used.

Yeah, it was a difficult, it was definitely a difficult time.

ANTHONY IMBESI: And you've mentioned, a little bit already, Stage 2. And I would like to clarify, Alstom was involved in Stage 2 of the LRT, which we're not focused on here. But for the purposes of Stage 2 they were manufacturing, is it 38 vehicles to be delivered for Stage 2?

JOSEPH MARCONI: Correct.

ANTHONY IMBESI: So that was being undertaken at the same time that they were completing the assembly of the Stage 1 fleet, in addition to performing the retrofits we've just

spoken about?

JOSEPH MARCONI: Correct.

ANTHONY IMBESI: And did you have any insight as to whether Alstom's work on Stage 2 impacted on its ability to deliver what was remaining for Stage 1?

JOSEPH MARCONI: I don't know how I can answer that. I do know that we were doing those weekly inspections, the walks in the shop. So from that I think we can -- it can be garnished on how things were progressing or not progressing properly. I would have to say they've only got so much footprint in that MSF, and so -- yeah, I think there could have been some sort of impact in terms of starting Stage 2 and impacting the additional work, or the remaining work they had to do on Stage 1. I would have to assume that there was definitely some impact there. As to how much of an impact, I can't really tell. I can't really know.

ANTHONY IMBESI: Would that impact be in terms of their resources by way of personnel, and also in respect of just the sheer amount of space they had to perform this work in the MSF?

JOSEPH MARCONI: I think both. The

logistics of moving things around and making sure that you maintain a certain beat rate; parts are arriving on time; and then making sure you have quality build before you move the assembly on to the next station is important. Because if you don't finish the work content where you want to do all that work, then you start chasing the module, or that component of the vehicle, down the production line trying to catch up. And all you're doing is disturbing the work that normally goes on in that work station.

So I'm sure they had a lot of that going on where they had to move the line, the work content in that line wasn't completed so now they had to chase to get that done and that just causes more disruption.

ANTHONY IMBESI: And what was your view as to the suitability of the MSF as the facility for the production, assembly and performance of the retrofit and ultimately maintenance work?

JOSEPH MARCONI: That's another thing that for -- in my opinion was kind of strange on this project, because I don't think I've ever

been involved in a project where a maintenance facility started its life as a manufacturing facility. To me they are two different entities and they are designed -- they are not necessarily designed in the same fashion.

And so I can understand the need to -- or the want to increase local employment and create jobs for people in Ottawa, and things like that, but, personally, I think having a manufacturing facility that is technically a maintenance facility is not the right thing to do, for a couple of reasons.

One is, you have to do transfer of technology, so you have to bring people in to train new people on site on what to do.

And then you have transfer of manufacturing, which is all the tools and implementation of all those tools and how things get set up in order to make a quality product.

So when you do that it sounds good and feasible at the beginning, and generally it does work out in the beginning, but what happens is that people either leave or quit and then all of a sudden you're left with a bunch of people that don't really know the processes as well as they

should because all the people that trained them, their mentors, are gone.

And so you get into this vicious cycle, and I've seen it before because I was with Bombardier and we did the same thing when we transferred technology from Europe to Mexico. We had to go back in three times to train people on how to build our product because the quality that was coming out just wasn't there.

To me it makes a lot of sense that if you're building a rail vehicle, which is a very hands-on, labour intensive job, it's not automated as much as you would think, not as much as the automotive industry is. You're better off having a dedicated manufacturing or assembly plant with qualified and trained experts putting the product together, that's my opinion.

FRASER HARLAND: Just to follow-up on that, is the main issue then sort of the quality of the personnel that you have in a plant like this, or is it space, or are both of them issues?

JOSEPH MARCONI: I think both of them are issues. I mean, if you take a look at the

Brampton facility that they have right now it's definitely bigger than the MSF. So they have a larger footprint to do parts, to do proper inspections and spread themselves out and put this thing together. You're not crawling all over the person next to you.

The MSF is quite a tight building, as far as I'm concerned, and that's all basically you need to maintain and run a system, not necessarily manufacture a system --

FRASER HARLAND: So in hindsight, from your perspective, if the Brampton facility could have been up and running at the beginning of the project and all trains constructed there, would that have been a better way to do things?

JOSEPH MARCONI: I would say, yes. I would stand behind that statement and say, yes. If you have a dedicated manufacturing facility, they would still have to do transfer of manufacturing and transfer of technology, no doubt, because the Brampton facility is brand new in North America as well. It's not like it's been there for 20 or 30 years, not like the Bombardier plant, now the Alstom plant in Thunder Bay that's been there for almost a

hundred years now.

You've got the Hornell plant that's been there for 30 or 40 years in New York. So you have these well-established areas or communities that have very well established manufacturing and assembly facilities where the people around that area can be called upon when a contract comes in, and basically it will be up and running in a year or so. Because it usually takes a year, a year and a half to get the designs out and materials ordered and things like that.

So you stand a better chance of getting a better quality, meeting your schedules, if you're producing in a facility that has experience doing that.

And Brampton doesn't have that experience yet so it's still on a learning curve, but it's still yet to be seen how well the Stage 2 vehicles are going to perform coming out of Brampton because it's brand new too, but they stand a better chance because that's all it does.

ANTHONY IMBESI: And on the topic of Brampton and Alstom's Brampton facility, was any

of the Stage 1 production, assembly or retrofit work, undertaken at the Brampton facility or is that entirely in respect of Stage 2?

JOSEPH MARCONI: The only thing I know in terms of Stage 1 was the retrofits to the APUs, all of the rest of the work was Stage 2 work.

ANTHONY IMBESI: And do you know why that was done specifically in Brampton as opposed to the MSF?

JOSEPH MARCONI: Probably space again, and being able to -- whatever they're doing I guess they don't want too many people, eyes and ears watching what they're doing, right? So it's probably easier to do it in seclusion somewhere in Brampton rather than having others seeing what they're doing in Ottawa. I would speculate though.

ANTHONY IMBESI: And did moving that component of the work to Brampton impact the project in any way? Did this cause delays, logistical issues, anything of that nature?

JOSEPH MARCONI: I don't think so. I don't think it has. They have been able to generally keep up with the APUs, APSs for the

Stage 1 vehicles when they fail. So I believe they have sufficient spares in order to keep them running.

For Stage 2 vehicles we do have some vehicles that don't have any APUs on them because Alstom have taken them for use on Stage 1. So we could have some vehicles right now that they have technically robbed of APUs to use. So far they have been keeping pace but they have taken from Stage 2 in order to satisfy Stage 1.

ANTHONY IMBESI: And after the May 2018 RSA date was missed, and I appreciate you came in after the fact, were you aware that OLRTC was paying daily liquidated damages from that first missed RSA date until the ultimate revenue service date?

JOSEPH MARCONI: I don't remember that at all, no. Sorry, I wasn't involved in the commercial aspects of the project so I don't recall that at all.

ANTHONY IMBESI: Was there significant internal pressure within OLRTC to make it to revenue service availability?

JOSEPH MARCONI: I would say we wanted

to get the job done, that's for sure. I would say it was all-hands-on-deck. And pressure? Well, I have been in situations similar to this before where you're dealing with -- sometimes you're dealing with difficult suppliers, sometimes you're dealing with difficult customers, so it's always a bit of a pressure cooker when you're trying to deliver a complex project.

I was involved in the vehicle aspect of it but the rest of the OLRTC team had a lot of other things on their shoulders as well besides vehicles.

I was strictly focusing on vehicles and my mandate was to get these things up and running and ready and delivered as quickly and as efficiently and safely and reliably as possible.

ANTHONY IMBESI: So did any pressure within OLRTC, did that have any impact on the management of the interfacing or the progression of the assembly and testing?

JOSEPH MARCONI: I mean, I don't think so. I mean, it's not like people were demanding that I have this done by Friday, or anything

like that. Things have to take certain time in order to get done correctly and done properly.

So I -- you know, did I feel any pressure from my management team? Not directly, or not specifically. I think they are very supportive and if I had an issue they would help me out and vice versa. I would try to help out if I could.

But globally I felt there was a lot of pressure trying to get these trains and vehicles and systems up and running. You would see the stuff in the news media and see the stuff from the City and whatever, so, yeah. From a global perspective I know there was a lot of pressure around. But personally the only pressure I felt was I just have to get these vehicles to the best -- the best they can be as quick as I can, and work with the people I have and the suppliers that I have in order to make that possible.

ANTHONY IMBESI: And so from August of 2018 when you first became involved in the project, was the biggest obstacle that was remaining to meet RSA the vehicles themselves?

JOSEPH MARCONI: Well, I can't speak

on behalf of all the other systems because I wasn't involved in any of them, just strictly the vehicles.

So to say that the vehicle was the critical path, so to speak, I can't really say. I mean, it all had to come together. I mean, the track work, the OCS, the buildings, the vehicles, it's not just one single element that can make the system run. Yeah, you have the vehicles ready but if the rest of the stuff isn't ready then you're not running. Or if the rest of the stuff is ready and the vehicles aren't ready you're not running.

So I really don't have a perspective on everything else other than just what I could see in my own little world here on the vehicle side.

ANTHONY IMBESI: And is it fair to say that the testing of the vehicles and the signaling system, but in particular the vehicles, was delayed and compressed overall?

JOSEPH MARCONI: I don't feel that it was. I mean, I wasn't really involved in any of the -- on Stage 1, I wasn't really involved in the Thales testing, D PICO tests, because -- on

Stage 2 I was, I kind of took over that role. But on Stage 1 most of the Thales testing, in terms of the vehicle and in terms of the wayside interfaces and things like that, that was all generally handled by either Steve or by Matt Slade.

So from the Alstom perspective, I mean, when I got on board Alstom had already completed -- I think there's 82 test procedures that Alstom has in their -- what we call the "Test Program Plan", there's 82 different tests. And when I got on board I believed they had completed almost 90 percent of those tests.

So, yeah, there were still probably some issues left with some of those tests because, as I mentioned earlier, there was still CRIs, CREs discussions going back and forth between us and the City and Alstom regarding the results of those tests, asking for clarifications. But with 90 percent or 92 percent of the tests -- vehicle tests from the Alstom side already done when I got there, I felt from a testing perspective that the vehicle was in very good shape.

ANTHONY IMBESI: And so what would

your level of involvement have been in terms of the testing and commissioning of the vehicle on the system, whether in specific segments, the testing and commissioning for the vehicles running the full track, would you have had involvement in that?

JOSEPH MARCONI: Yes, I would have, in particular only certain tests. For example, ride quality testing. I was also involved in the noise test, the interior dynamic noise tests. I was also involved in the high speed data radio testing on the main line. This is the rear-view camera system, which today we still have issues that still need to be resolved by Alstom. I was also involved in the EMC testing, the full system EMC electromagnetic interference testing. That wasn't an Alstom test. That was done by a third party company called Vican. So I was responsible for that.

And the last one I recall was the Bell testing for the radio, for the P25 radio. This was a radio that was supplied by the City to be installed by Alstom. And the testing was under the control and responsibility of the City and Bell, but we supported that testing, OLRTC

supported that testing with Alstom because we obviously did have some vehicle interfaces with that radio.

So basically those five or six tests were the one that I was involved in that required either full or partial main line access.

ANTHONY IMBESI: So you don't feel that there was any less testing or commissioning done than what was originally planned for?

JOSEPH MARCONI: Well, in some cases. I'll give you an example, the ride quality test. When I arrived in August of 2018, Alstom had already conducted -- I was aware they conducted the ride quality test in 2017. However, that that was not accepted by OLRTC or the City because the test procedure, the whole test procedure said that the test had to be run on the entire alignment. So here's Alstom trying to say that, you know, this test is valid, it's good, it's -- it should be accepted, but it wasn't even tested on the entire alignment, according to their own procedures.

So there was some arguments going back-and-forth to getting Alstom to run the test

again. And then I believe in September of 2018, like a month after I arrived, they ran the test again. Because I think around that timeframe that's when full track access was officially granted so they ran the test again.

I wasn't there during the test because I was travelling back-and-forth, and I think they ran the test either on the weekend or at nights so I wasn't available to participate.

But they ran the test. We thought they had done everything correctly. But we get the report and we find out, again, that they only ran certain sections of the track, they didn't run the entire alignment.

So here again they started arguing with us about the track suitability. So again we forced them to run the test again. And they never ran the test next time until, I believe, March of 2019. And at that time we agreed upon a reduced instrument scope on the trains. And they actually had to bring people in from France, equipment and people in from France to actually run the test in March.

So you could see some of the struggles that we had, because on one end you get Alstom

saying, Hey, we think we have everything right. But then they didn't follow their own procedures and they kept arguing back-and-forth until they finally agreed with us and ran the entire alignment.

ANTHONY IMBESI: So with the reduced instrument scope that you had mentioned, is that an indication that Alstom couldn't meet the requirements that they were supposed to meet with respect to that test? Why would there be a reduced instrument scope that was accepted by OLRTC?

JOSEPH MARCONI: It was accepted by OLRTC and the City, and the reason we accepted the reduced scope of instrumentation is because -- to instrument a train takes about three or four days. So in order to cut back on the duration for instrumenting the train we decided on a reduced scope for where to place the instruments.

And what we would do is when we ran the test we asked Alstom to compare the results of those signatures, of the areas that we did instrument, with the results from the previous tests.

So if, for example, the vibration levels were in line with one another, we knew that the other areas were also in line. And so we only instrumented the areas where we felt that were more severe or more problematic in terms of the ride comfort of the vehicle, like the operator seat, or, you know, the middle of the car.

So in certain areas the vibrations are technically a lot -- not higher but higher than other areas from the vehicle due to the stiffness of the vehicle. So that's why we agreed upon a reduced instrumentation scope and using the data from previous tests to validate that that was the right decision to make.

ANTHONY IMBESI: And so I guess the point of that was to save time, correct?

JOSEPH MARCONI: Correct. Save time in terms of instrumentation and get out onto the track and complete the entire alignment.

ANTHONY IMBESI: And so in terms of -- so that's -- it's fair to say then -- I mean that's an example of some of the compression of the testing?

JOSEPH MARCONI: Correct.

ANTHONY IMBESI: And so in terms of that, and any other aspects of the testing that may have been compressed in some manner, did the level or progression of testing lead to any concerns on your part about potential implications into the reliability of the system?

JOSEPH MARCONI: No, not really. I mean, we had certain testing protocols to follow. Yes, tests like the ride quality we kind of deviated from that a little bit as it morphed into a different kind of criteria in terms of test set-up. But there wasn't -- from what I recall, at least the tests that I ran with Alstom on the vehicle, there wasn't too many that -- other than the ride quality I think that kind of did that, right? Everything else they basically followed the procedure and executed a test and we obtained the result, whether they failed or whether they passed.

ANTHONY IMBESI: So in your view then, was the overall level of testing and commissioning sufficient?

JOSEPH MARCONI: I believe it was. I believe it was sufficient. And we're talking 82 separate tests just on the Alstom side so that's

a lot of testing. And that's generally type testing or quality testing, not series testing, that doesn't include the series testing that you do on every vehicle. So I think the level of testing was adequate. Fit for purpose.

ANTHONY IMBESI: Would you have wanted more if you had the option of it?

JOSEPH MARCONI: I don't think so. I've been involved in testing before, in the test program plans that I've seen I think generally all of the -- all of the major aspects of a test program were captured in Alstom's test program plan.

So I think it was -- I think it was all there.

ANTHONY IMBESI: Was there any --

JOSEPH MARCONI: I can't speak too much from the Thales side of things, but definitely in the Alstom side I believe that, you know, the level of testing was pretty good.

ANTHONY IMBESI: Right. So and when you're talking about testing I appreciate you're talking primarily about Alstom's testing of the vehicles, but there would have been testing and commissioning of the train running in

conjunction with the signaling system, correct?

JOSEPH MARCONI: Yes. But -- all those tests -- those type of type tests were with Steven and Matt as part of the integration testing, Steve and Matt. Because Matt was kind of handling all the Thales interfaces, especially with wayside. And Steve was handling a lot of the system integration testing either with OCS or either with the stations themselves, like vehicle clearance testing, all that, Steve was doing -- Steve was doing those tests.

I was kind of left with the ride quality, the noise testing, high speed data radio testing, the EMC testing, the P25 testing. So there's five or six tests that I recall that I kind of stepped into. Steve didn't handle those but all the rest were in Steve's test program.

ANTHONY IMBESI: And that's Steve Nadon and Matt Slade?

JOSEPH MARCONI: Correct.

ANTHONY IMBESI: And were those tests being performed in conjunction with the tests that you were doing? I'm trying to get an appreciation of how and when these were

happening.

JOSEPH MARCONI: By the time I joined until December of 2018, I believe he had some of those tests -- like the ride quality, for example, in 2018, when I was there, just one month, I'm pretty sure that was being done in -- not necessarily in conjunction but, you know, maybe Steve was running other tests on the other track while Alstom was running the ride quality on one track in September. So there could have been some parallel activities happening during that timeframe.

But, you know, once we started getting into March in terms of the EMC testing, in terms of the repeats of the ride quality testing, high-speed data radio testing, for example, I think those were kind of basically stand-alones.

And I think I was generally out there with Alstom by myself doing those tests. And I don't think there was any other -- Steve Nadon tests happening in parallel, from what I recall.

ANTHONY IMBESI: And you may have mentioned this but EMC testing, that refers to what?

JOSEPH MARCONI: Electromagnetic --

EMI, electromagnetic interference. Basically it's like cell phones and big electronic equipment and power transformers along the alignment, and even the overhead catenary wire all give off electromagnetic waves.

ANTHONY IMBESI: To make sure nothing interferes with --

JOSEPH MARCONI: Correct. So you have all the systems running on the train and it's stopping and going and you have to make sure it's not affecting the operation or the running of the vehicle. You have to make sure that those frequencies are not conflicting with one another.

ANTHONY IMBESI: Right. Okay. And there was any plan in place for what I'll call just "dry running", the system running fully integrated prior to the trial running and ultimate RSA just to test it and make sure it runs appropriately and adequately?

JOSEPH MARCONI: I think there was some dry running done, but I can't recall when that took place. There could have been some between the time that I joined and December of 2018, and there could have been some even before

the first submission of our first attempt at substantial completion.

I'm sure there was some running back-and-forth just so see -- you know, timing for example, station dwell times and making sure -- round trip travel times and things like that. So I'm sure there was some level of dry runs done then. Whether the vehicle stopped and the doors open and closed, I'm not so sure.

ANTHONY IMBESI: So you wouldn't have any insight as to whether what was done was sufficient in terms of the length of that dry running or the extent of it?

JOSEPH MARCONI: No, not in that aspect. No. I don't recall.

ANTHONY IMBESI: And did you have any view or any concerns as to OC Transpo's level of readiness for service?

JOSEPH MARCONI: I don't really think I have an opinion on that. We supply our drivers, sometimes we had our own drivers for a certain test. At that time the system wasn't owned by the City so OLRTC had its own drivers to drive the trains.

So I really can't say whether they

were ready or not because that wasn't really my focus on the job.

ANTHONY IMBESI: Did you have any involvement in trial running itself in -- I believe it was in August of 2019?

JOSEPH MARCONI: No, I didn't. I was aware that there was a procedure. I was aware that there was a score card that was put together within that procedure. I was verbally told that I would not be required to support trial running and I would be basically on an on-call basis. So if something came up related to the vehicles or related to Alstom, that if I was needed then be prepared and stay close by your phone, or whatever, and we'll call you if we need you.

I do recall prior to leading up to trial running, that I think I was putting together like a staffing plan or whatever, like the people that I had, like myself, JL was working for me, I believe I had a guy by the name of Dan working for me. Paul Gardner was another one. I think there was Mark Turner who was a consultant, he was also available. So I put like a staffing plan together just in case

people needed one of us at a certain time during this period, but -- and I submitted it, but nobody ever called.

ANTHONY IMBESI: So you were never required, you never called in to deal with anything from trial running?

JOSEPH MARCONI: Not one thing.

ANTHONY IMBESI: What would you have expected? What would be something that would have led to your involvement?

JOSEPH MARCONI: Well, say for example they had a condition where the vehicle didn't brake in time, or it went past its stopping point, or they had situations where doors failed to open, or anything related to, say, a vehicle failure that would generally probably cause a service interruption. Just like we do for the conditioning of the Stage 2 vehicles, where if there's a failure that causes a system -- the vehicle failure that causes disruption of greater than five minutes, then I figured I might be called in to help diagnose or troubleshoot, or at least work with the supplier, Alstom, to determine the root cause.

ANTHONY IMBESI: So is it a fair

characterization then to say that if there was an LRV performance failure during trial running, that would be something that you would be expected to be called upon to address?

JOSEPH MARCONI: Exactly. If there was a failure that nobody understood or nobody knew what the cause, the root cause of that failure was then I would call -- if they knew what the failure was or what caused it, if it was operator error while they were doing the trial running, or something like that, and that generated a failure, they wouldn't call me for something like that.

So if they knew what the root cause was and they fixed it and away they went they wouldn't call me, but if it was something that they couldn't figure out or they needed someone to dig a little bit deeper into it with Alstom, then I would expect they would have called me.

ANTHONY IMBESI: And were any failures or issues, or anything arising during trial running, communicated to you at any point? I appreciate you weren't called upon, but were you informed of the goings on of the trial running?

JOSEPH MARCONI: No. Once I heard

trial running had started then I heard it was done and we were on to the next phase. So, no, I never got any emails or any communications, any phone calls related to the happenings of trial running.

ANTHONY IMBESI: So you wouldn't be aware then that the requirements that had to be met to pass trial running were changed midway through trial running?

JOSEPH MARCONI: No, sir.

ANTHONY IMBESI: And so you wouldn't be aware of any maintenance failures on the part of Alstom in the score keeping?

JOSEPH MARCONI: No, sir. Not that I recall.

ANTHONY IMBESI: So just turning -- I appreciate we are approaching the end here. We just spoke about trial running, so following that obviously it was revenue service availability and operations commenced on the system?

JOSEPH MARCONI: Yes.

ANTHONY IMBESI: So how was the handover handled as it related to the LRVs, in terms -- from OLRTC to RTM? Was there a

procedure in place? Was information provided? How was that -- how did that work in practice?

JOSEPH MARCONI: I probably have to step back a little bit because it all starts with the final inspection process. So we went through the final inspections of all those 34 vehicles between January and end of February, early March, created our punch lists, those punch lists went into the car history book. Those punch lists were actioned upon by Alstom and car history books were updated accordingly.

So at the end of the day what we delivered -- what we delivered to the City is we delivered two car history books.

We delivered the Alstom car history book that contained our punch list, it contained the vehicle configuration, it also contained any open modifications that still needed to be done to the vehicle that were not safety or performance related. It contained some inspection reports, like for vehicle leveling weight reports, how much the vehicle weighed, car body tolerance reports. So the binder is quite thick.

That binder got into the hands -- we

ultimately delivered that to RTM, they are the keepers of the hard binder. And the electronic versions are delivered to RTG through to the City.

So basically once all that was done then -- that's for Alstom as well as Thales, because Thales also has a car history book that was prepared and delivered.

Once all that was done, within the car history book I would sign the final acceptance certificate and date it. That was part of the car history book from OLRT's perspective. And then once trial running was all done the next step was to generate the bill of sales for all these 34 vehicles, so that the possession or the ownership of the vehicles could go from Alstom/OLRTC to the City.

ANTHONY IMBESI: And so was there anything that you felt was missing from that handover process that would have ensured a smoother transition?

JOSEPH MARCONI: From the vehicle perspective I don't believe so. I mean, I put the final acceptance procedure together myself. That was reviewed internally as well as with the

City and with Alstom.

So we went through all the steps in terms of the delivering and all the commitments within that procedure.

And so car history books were delivered, safety certificates were available, all inspection punch lists were up-to-date, all the testing was done, all the reports had been submitted, and anything else that was still left open that needed resolution was part of the MDL.

ANTHONY IMBESI: So in terms of the minor deficiency list, and we had spoken about this earlier, but did you feel that RTM inherited a system that required greater maintenance than was originally anticipated?

JOSEPH MARCONI: I don't know how to answer that question. Level of maintenance is originally anticipated. So, I mean, I think hindsight being 20/20, I felt -- after the cars went to revenue service, in the first couple of weeks everything seemed great, everything was working good. And then all of a sudden failures started to happen and things started to spiral a bit out of control.

You know, after I think it was

October, November, things started happening. So obviously when that happens the -- there's definitely going to be an impact towards maintenance activities.

So I don't think anybody could have predicted one way or the other how that was going to -- how that was going to transition. I mean, everything started off good, everything went well. We had our -- you know, our first couple of weeks and excellent run, the vehicles were available. And then all of a sudden things started to go off track a little bit.

So, yeah, I think, you know, hindsight being 20/20, definitely that would have an impact on maintenance.

ANTHONY IMBESI: These issues arising?

JOSEPH MARCONI: Yes. But nobody could have predicted that.

ANTHONY IMBESI: Right. And do you have any insight into these issues that occurred following revenue service, you mentioned a few towards the end of the year. I know there are quite a number of them, obviously the most significant being the two derailments. There was a flat wheel issue, the cracked wheel issue

and some of the earlier issues as well. Do you have any insight into any of that?

JOSEPH MARCONI: Well, the cracked -- all these issues that have arisen, yeah, I was made aware of them. Was I involved in them in terms of providing any technical inputs or recommendations or positions on that? The answer is no. I was aware of the situations but all those items were -- you know, they are handled above my level.

As far as I'm concerned, even on the derailments, I don't think anybody in OLRTC was invited to any of those derailments or even any of the meetings that were held say between RTM and Alstom and even the Transportation Safety Board. I don't think there was any OLRTC people there, as far as I'm aware. I wasn't there and I don't know if anybody from OLRTC was either.

ANTHONY IMBESI: So you personally had no involvement in relation to any of these issues that occurred with the system?

JOSEPH MARCONI: Nope. Not on the derailments and not on the wheel cracks. Obviously down the road, for example, wheel cracks became like an open item on our punch

list or Stage 2. Obviously we have to make sure -- because the vehicles on Stage 2 had the same wheels as Stage 1, so we had to become aware of what the root causes were so that we could make sure that Alstom was taking action in the delivery of the new vehicles to prevent that from happening again.

So from that aspect, yes, in terms of making sure that we didn't repeat the -- those problems. But you know, how it was handled, how it was dealt with, how it was resolved and all the investigative work, I wasn't involved in any of that.

ANTHONY IMBESI: And so you mentioned the implementing some knowledge from the cracked wheel issue into the Stage 2 vehicle delivery, is there anything that was imported from any of the other issues into the Stage 2 delivery.

JOSEPH MARCONI: I'm sure there was, my mind just seems to be wandering now. Definitely there was, but I would have to take a look at the list -- the punch list myself and I could pull out items that happened on Stage 1 that we have to make sure that we don't step on those nails on Stage 2. So, yes, there are

examples but I can't think of any off the top of my head right now.

ANTHONY IMBESI: Okay. And was there any discussion to a soft start to the opening of the system whether that be reduced service, any kind of modification that would allow a ramp up of operations?

JOSEPH MARCONI: Not directly with me, but, again, hindsight being 20/20 it would have probably been a good idea to do some sort of soft start and maybe not pull all of the City buses out of service as soon as you have 30 or 34 vehicles on the main line.

I mean, obviously somebody had a lot of confidence in that and maybe a soft start would have been the way to go. But it's like hindsight is 20/20, so to speak.

ANTHONY IMBESI: Right. and so you mentioned no discussion with you but were you aware of any discussion about a soft start during your time prior to revenue service?

JOSEPH MARCONI: No, not with me. There may have been discussion but I wasn't involved in those discussions.

ANTHONY IMBESI: Okay. And not aware

of those discussion having taken place?

JOSEPH MARCONI: I don't recall. I don't recall those discussion.

ANTHONY IMBESI: But in hindsight that would have been something that you would advocate for?

JOSEPH MARCONI: Oh, definitely. It's a Greenfield, brand new system all around, brand new vehicles. It makes a lot of sense. It's different when you're delivering like one vehicle at a time, or two vehicles at a time to an already established transit authority where they -- the track works and the civil works and there's stations and their main facility is all up and running.

Even in some of those case, like for example, New York City Transit, when you deliver brand new vehicles to the New York City Transit for the first time, they go into a 30 day test. So, you know, they have 30 days of basically trial running that vehicle instead of 12. Some authorities are six months to a year, depending on the complexity of the system. I think the new high speed rail that Alstom is building for Avelia, Acela, I think a year's worth of work.

It's fairly complex so I can understand why.

So when you're doing a system like that, you know, maybe you can go shorter, maybe you can go longer. Some people -- some authorities have different requirements. But hindsight being 20/20, like I said, I think a soft start or a gradual introduction of trains and building up the fleet to a certain level before going to the next step makes sense.

ANTHONY IMBESI: So did you have any view then as to whether the 12 day trial running was an adequate length of time?

JOSEPH MARCONI: That's what the contract required, from my understanding. So I may have views, but if the piece of paper that you're signing, your contract, says that's what you shall do then that's what you shall do.

ANTHONY IMBESI: I appreciate that. But in your experience, given what you have said, do I take it that you would have liked to have seen a longer period of time?

JOSEPH MARCONI: Yeah. Especially, you know, you think about the vehicles running for 30,000 -- some of those vehicles have run well over 30,000 kilometres, but did they really

run as a system? You know, they're out there running, they're doing their certain tests and coming back in. You know, maybe they're shuttling between two different stations and doing all sorts of things to accumulate 30,000 kilometres. So from a system perspective, I'm putting my system's hat on now, you would probably want to -- probably might want to run more than 12 days to see if everything is working right, if you have maintenance working right.

If you've got -- if the trains come in, your whole work order system, is that working correctly? Or are people doing what they need to be doing? Are the operators showing up on time to launch the trains? All these sorts of things. I mean, is 12 days really sufficient to prove all that? Personally I don't think it is, but that's the way it was done.

ANTHONY IMBESI: And in terms of the length of trial running and also in the context of discussions about a soft start, does the level of experience of the operator inform the length of time that you feel that should occupy.

For example, if it's a new operator with the City of Ottawa, would that require a longer period of time for trial running or a longer soft start or more significant soft start than an experienced operator?

JOSEPH MARCONI: I don't know, I think so. Yeah, if it's a brand new operator they -- you know, they got new people that never experienced that before, or maybe they have people they haven't even hired yet to handle certain situations.

So I would say more than likely, yes. But you know, it's hard for me to speak on behalf of OC Transpo or the City as to what they consider sufficient or not sufficient. I mean, from the outside looking in sometimes longer is better, sometimes, you know, you just want to get going and gain from the experience that you get back. So it's a tough call. Sometimes it's not an easy situation.

ANTHONY IMBESI: And so those are all the questions that I had, my colleague Mr. Harland may have a few additional ones. But before I turn it over to him, is there anything else that we haven't touched on that you think

we should know?

JOSEPH MARCONI: No. I think I've said enough. My mouth is kind of dry. Thank you.

FRASER HARLAND: I know we're nearly out of time, I think the only thing I wanted to follow-up on is we touched on a number of the train issues, but I don't think we spoke specifically about wheel flats. Do you know anything about the wheel flat issue that the trains experiences? What is your experience with that?

JOSEPH MARCONI: Yeah. You know, we were experiencing those even during testing and during running. Not necessarily trial running but prior to trial running we were experiencing some wheel flats. And I kind of attribute that to adhesion issues between the rail and the wheel, so obviously sliding conditions.

And there could have been situations there were -- like I talked earlier that the fine tuning between Alstom's system and Thales' system in terms of train control being not finalized yet. They were still -- software was still being released and changes were still

being made to fine tune the system. So there could be those situations there that could have caused some of those flats. So I was aware of the situation and the root causes behind them, but those are some of the things you experience when you start-up a brand new system like this.

FRASER HARLAND: And the root causes there, is that related to the sliding? Or what are the root causes that you were aware of?

JOSEPH MARCONI: Well, I mean you know, the reaction times, I mean there could have been a number of things. It could be reaction times. It could be Thales and Alstom interfaces that needed to be fine tuned in some respects. There could be wheel flats caused by defective equipment. I know we had some brake caliper issues, some HPU issues.

So if you had defects in equipment, on the brake equipment on Alstom side, those could cause wheel flats. And then you had conditions where you have brand new rail with brand new wheels, you're out on a system that maybe you had a lot of moisture on during the winter time, and you have ice on the rails and that may not have been cleaned up properly, and all those

lead to adhesion issues.

I think there was some issues with sanding. I think at one time, if I recall correctly the wrong sand was being used on the -- on the sanding system. So you would get some spin issues there that could cause some wheel flats in terms of not getting enough adhesion during acceleration. So there is a number of issues out there that did cause these wheel flat problems.

FRASER HARLAND: And are you aware of anything on the operator side in terms of choosing between different braking levels or profiles that would contribute to or help to avoid wheel flats?

JOSEPH MARCONI: Yes, I'm aware of that. I think there are different braking levels within the Thales system. You know, depending upon the environmental conditions, the temperature, snow or rain or whatever, you can go to a less aggressive braking rate, which technically puts less pressure on the calipers and would generate less potential for wheel flats. So, yes, I'm aware that the technology is there to help the operator make those

selections, depending upon the conditions that the vehicle is faced with during operation.

FRASER HARLAND: In light of the time, those are my questions.

--- Completed at 12:10 p.m.

REPORTER'S CERTIFICATE

I, HELEN MARTINEAU, CSR, Certified Shorthand Reporter, certify;

That the foregoing proceedings were taken before me at the time and date therein set forth;

That the statements of the presenters and all comments made at the time of the meeting were recorded stenographically by me;

That the foregoing is a certified transcript of my shorthand notes so taken.

Dated this 10th day of May, 2022.

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PER: HELEN MARTINEAU
CERTIFIED SHORTHAND REPORTER

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