Ottawa Light Rail Commission

Gareth Wood
on Tuesday, May 3, 2022

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OTTAWA LIGHT RAIL COMMISSION

CITY OF OTTAWA - GARETH WOOD

May 3, 2022

---- Held via Zoom Videoconferencing, with all participants attending remotely, on the 3rd day of May, 2022, at 2:00 p.m. to 4:00 p.m.

COMMISSION COUNSEL:

Liz McLellan, Co-Lead Counsel Member
Kate McGrann, Commission Counsel Member

PARTICIPANT:

Gareth Wood, City of Ottawa
Jesse Gardner, Esq. Singleton Urquhart Reynolds Vogel LLP counsel for Mr. Wood

ALSO PRESENT:

Colleen Rea, Stenographer/Transcriptionist
Chandani Joshi, Virtual Technician

--Upon commencing at 2:00 p.m

GARETH WOOD: AFFIRMED.

MS. MCLELLAN: Good afternoon, Mr. Wood. My name is Liz McLellan, and I'm Commission counsel. I'm also joined by my colleague Kate McGrann who is the co-lead counsel for the Commission.

I'm just going to read a quick introductory script to you, and then we'll proceed with the questions for your interview.

So the purpose of today's interview is to obtain your evidence under oath or solemn declaration for use of the Commission's public hearings. This will be a collaborative interview such that my co-counsel Ms. McGrann may intervene to ask certain questions. If time permits, your counsel may also ask follow-up questions at the end of this 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 hearing's committee.

MR. WOOD: Understood, thank you.

MS. MCLELLAN: The script is still

ongoing. Sorry about that.

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 non-typographical corrections made will be appended to the transcript.

Pursuant to Section 33(6) of the Public Inquiries Act 2009, that section provides a witness on an inquiry shall be deemed to have objected to answer any question asked of him or her on the ground that his or her answer may tend to incriminate the witness or may tend to establish his or her liability to civil proceedings at the instance of the Crown or of any person, and no answer given by a witness at any 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 giving such evidence.

As required by Section 33(7) of the Act, you are hereby advised that you have the right to object to answer any questions under Section 5 of the Canada Evidence Act.

So we'll proceed now with the questions for your interview.

So first, I'm going to pull up Exhibit 1 in your interview, and it is a copy of your CV. So are you familiar with this document?

MR. WOOD: I am indeed, yes.

MS. MCLELLAN: And so I'm going to ask you about some of your areas of specialization, and let me know if you want me to zoom in, if that would be helpful.

MR. WOOD: I can read that. That's fine.

MS. MCLELLAN: Perfect. So in terms of your areas of specialization, can you provide a bit of background on what you mean by systems engineering and process creation and what that entails?

MR. WOOD: Yes, systems engineering is

sort of an over-arching process which is utilized on transit projects. It's sort of manifested itself from the 50's from NASA and from some earlier standards, and that's really just so the application of that to that particular type of engineering. It comes along with more of the safety critical work.

MS. MCLELLAN: Okay, and then how about requirements, management, and specification?

MR. WOOD: Yeah, that's really going back through a design process in trying to understand what the plan requirements are, how to put those into practice and to turn them into a design.

MS. MCLELLAN: Okay. And then safety and security analysis?

MR. WOOD: Safety and security analysis is particular standards on how safety and security can be assessed and particular logs can be generated, and that's really the application of those standards.

MS. MCLELLAN: Okay. And we'll return to your CV in a moment, but I just want to ask you generally about your prior professional experience relevant to the OLRT project and your prior light

rail experience?

MR. WOOD: Yeah, sure. Where would you like me to start?

MS. MCLELLAN: Just generally, like any relevant experience --

MR. WOOD: Yeah.

MS. MCLELLAN: -- on the OLRT project.

MR. WOOD: As you can tell by my accent, I'm originally from the United Kingdom. I'm actually Canadian, but I worked on a couple of projects -- light rail projects in the UK. Moseley Tram and Edinburgh Tram. Before that I was in really high speed metro, high capacity metro and some community rail projects because light rail hadn't really -- it had gone through a bit of a glut where it hadn't been utilized in some of the cities and, of course, the then Moseley Tram and Edinburgh Tram came along, and I was involved in that.

And then the flavour of the industry is such that light rail is really cropping up in many cities, which are expanding beyond the million in population. So they find a necessity to put that light rail system, and so that's really where the market's taking most transit engineers at the

moment and metros, of course.

MS. MCLELLAN: Okay, and so is there a list, or can you provide a list of the prior light rail projects that you've worked on?

MR. WOOD: Yeah. As I said, I worked on Edmonton northeast extension, I worked on Edinburgh Tram, and I worked on Moseley Tram.

MS. MCLELLAN: And what does your prior P3 experience entail?

MR. WOOD: P3 I worked on Jubilee line extension, I also -- Moseley Tram was going to be a P3 and also Edinburgh Tram was a P3 as well.

MS. MCLELLAN: So I'm going to share my screen again. And I want to speak about specifically your -- I believe this is your initial experience with OLRT project.

MR. WOOD: Yeah.

MS. MCLELLAN: So in terms of your title, so you are the lead for vehicles communications -- pardon me, you were the lead for vehicles communication systems, signalling, CBTC and traction power, OSC lead within the rail implementation team. So what did this role entail overall, and then we'll go into the specific areas?

MR. WOOD: It's really managing the

output from RTG. And really it's, you know, looking at some of the design aspects, looking for the compliance to get project agreement. That's solely the role of the lead. And also to interact with some of the City's engineers, CTP, who were assisting us with some of the technical evaluation.

MS. MCLELLAN: And so in terms of being a lead for vehicles, what does that entail?

MR. WOOD: Yeah, really just to manage the various aspects of the project and to report to -- at the time I was reporting to Mr. Holder and Mr. Craig. Mr. Craig initially. And really understanding the progress of the project and reporting any particular issues through a number of reporting mechanisms we had within the project team.

MS. MCLELLAN: And then so we'll dig into those later, but in terms of communications, what did that entail for your role?

MR. WOOD: Yes, we had regular biweekly meetings. We used a mechanism called a quad which was a risk analysis of the project and where it was going, and that was basically collated and reported to I think within the various committees in the City.

MS. MCLELLAN: When you say risk analysis, what did that involve?

MR. WOOD: Scheduled risk, cost risk, as best we could. Technical risk as well, forthcoming activities, things basically, you know, I would say that could be troublesome on the horizon. So things like that on a biweekly basis. And also to really engage with the other leads as well to understand. Because it's a large project, we needed to know what was happening between each other.

MS. MCLELLAN: What were the steps taken once a risk was identified?

MR. WOOD: Some of the risks were entered into -- I've forgotten what the system is called. There was -- the City had created a system in which we could enter risks and scoring mechanisms, so there would be a portion of money and time, et cetera, depending on what the risk was.

MS. MCLELLAN: Okay. And can you, sitting here today, think of any examples of the risks that were identified?

MR. WOOD: I think one of the earlier risks would have been some of the requirements

definition by RTG.

MS. MCLELLAN: The what?

MR. WOOD: Requirements definition. The requirements gathering process.

MS. MCLELLAN: Okay, so what was involved with that in terms of identifying the --

MR. WOOD: It would have been entered into as with a nominal sum and a sort of a time expiry in there.

MS. MCLELLAN: Okay. And then in terms of your role with respect to signalling and CBTC, so for the record, can you provide what CBT stands for -- CBTC stands for?

MR. WOOD: Computer-based training control. It's really a -- it's a guidance control system, if you like, for the vehicle to provide safe operation along a track so they don't collide with one another.

MS. MCLELLAN: Okay. And then so particularly with signalling, how were you involved with signalling on the project?

MR. WOOD: Signalling, once again I'm looking at compliance of the signalling system. There's a series of requirements in the project agreement which we adhere to. And I was involved

with some of the early meetings with Thales in Toronto with going over the overall design proposal I would say.

MS. MCLELLAN: Okay. And so were you involved in the actual selection of the signalling system requirement?

MR. WOOD: No, that's solely for RTG to determine. The RTG had a variety of different signalling system manufacturers on the books and it was up to them to choose the best fit for that project.

MS. MCLELLAN: So how was the best fit determined for the project?

MR. WOOD: I wouldn't know. That would be RTG to determine. It was their risk to design that system.

MS. MCLELLAN: Okay. Then can you provide a bit of background on what traction power/OSC lead and what -- or OCS --

MR. WOOD: Sure. Transaction power is the distribution of power to the electric vehicle. In this case it was through an overhead catenary system of suspended wire. It goes through a mechanism called a pantograph. This is then connected to a motor, very simply, and then the

return current is passed through the return rail and back to the power supply. It's a very simple system. It's been around since the late 1800's.

MS. MCLELLAN: And then before we get into your project accomplishments, just generally who did you report to in your role?

MR. WOOD: Yeah, as I said, I reported to Mr. Gary Craig for an early part of the project, and I think about 2015, 2016, I then reported to Mr. Richard Holder.

MS. MCLELLAN: Did you oversee anyone in your role?

MR. WOOD: Did I oversee. I had a couple of students with me. And primarily I had four people from CTP who supported me. Mr. Barstow, Mr. Tabolt, Mr. Carney, and Mr. Rose, for different disciplines.

MS. MCLELLAN: And then did you take over for anyone in 2011 or was this your role --

MR. WOOD: Yes, I did. You're right to question that. I took over from another Gareth, Gareth Jones. He preceded me and did some of the earlier work on the project agreement.

MS. MCLELLAN: What did his earlier work entail?

MR. WOOD: His early -- well, I joined a little bit later, obviously, than him. He would have set up the initial project, I suspect, with the team. He was primarily at the time engaged in some market standing with some of the vehicle manufacturers that he was trying to gather information that would give a project agreement which would be as -- let me see, as comprehensive to allow all the vehicle manufacturers to be able to bid on the contract.

MS. MCLELLAN: What was the transition -- I've forgotten his name. His first name was Gareth as well, I think you said -- what was the transition from him passing along his role and responsibilities to you?

MR. WOOD: I think it was just some -- It was a request from Mr. Craig. When Gareth Jones had decided to depart, he asked me to step into those shoes.

MS. MCLELLAN: Okay. And do you know why Mr. Jones decided to depart?

MR. WOOD: I think he -- he had some other family engagements somewhere else. A winter out of the country. I think his wife is in government and she had to go somewhere else on some

new job.

MS. MCLELLAN: Okay, so looking specifically at your project accomplishments, can you provide a bit of background on the first accomplishment which says provided technical support and program management for the City's Confederation line?

MR. WOOD: Absolutely. So as you can imagine, it's quite a complex system as such. So I'm looking at basically trying to pull the four people I mentioned, talk to them, understand how -- get different perspectives, some of the technical issues that RTG may or may not provide and some of the data, and we'd go and do some assessment of some of that in terms of its overall compliance. So they would be used for more detailed assessment of some of the proposals that RTG had made.

MS. MCLELLAN: Okay. And then in terms of your accomplishment of managing, I assume you were the managing liaison with vehicle exterior, accessibility and interior styling to suit the City requirements?

MR. WOOD: Yeah, so one of the earlier parts to the project there was a delivery of a mockup, which is basically I would say a third of

the train. That was brought to Ottawa for public review. It's essentially a dead vehicle. It doesn't have any real technical interior. It's just more of cosmetics and livery et cetera, and that was delivered to show people what they were getting to get some excitement into the City and also get feedback from people like the ability impaired to understand how their needs would be met.

MS. MCLELLAN: Okay. So other than looking at the ability impaired and how their needs would be met and creating general excitement, was there any other, like, substantive purpose to the vehicle mockup?

MR. WOOD: Well, there's obviously the cab area would be the first time that the driver interfaced, the seating, the desk would be exposed and how that arrangement works with the driver.

MS. MCLELLAN: And in terms of being a liaison, who were you a liaison between?

MR. WOOD: I was primarily working with RTG and OC Transpo.

MS. MCLELLAN: In terms of City requirements for the vehicle exterior, accessibility and interior styling, what were some

of the City requirements that you had complied with?

MR. WOOD: There wasn't a lot of City requirements on that. It was merely some approval and submission of colours, et cetera. And in terms of what was delivered, Alstom was trying to provide a number of different options to the City of which the City could have a choice.

MS. MCLELLAN: What were those options?

MR. WOOD: It's difficult to describe because they were more -- they were more sort of cosmetic options like colour schemes, et cetera. There was a number of slides presented earlier on which were -- which provided the interior and exterior options.

MS. MCLELLAN: And what were the technical specifications, if you can recall?

MR. WOOD: There was no real technical specifications for that because, as I say, it was more a subjective thing. I think there was what we call the tulip design. The front of the nose. The Alstom design itself leant itself to some certain customisation for different cities, and I can't remember which City in France they use a silk worm approach to the front of the nose. Here the

suggestion was to have a tulip side to meet with the Ottawa sort of historical references there. And there was a number of different ways of really displaying and showing the vehicle to the public.

MS. MCLELLAN: Are you aware of how -- I think Ms. McGrann has some questions.

MS. MCGRANN: Were you involved in receiving requests for feedback on the design book and providing City feedback on the design book to RCG after they had been selected as the successful proponent?

MR. WOOD: How do you mean, Ms. McGrann?

MS. MCGRANN: I mean were you involved in assisting the City in responding to any design request with respect to the vehicle that came from Alstom through RTG?

MR. WOOD: I did get involved with a lot of discussions between OC Transpo and RTG, sort of in between the two groups, yes.

MS. MCGRANN: With respect to the design of the vehicle?

MR. WOOD: No. Depends what you mean by design. The structural technical design, no because that would be Alstom to do that. But in

terms of colour schemes and things like that, yes, I was involved in that.

MS. MCGRANN: What about the configuration of the interior and the inclusion of things like handles for passengers to hold onto when they ride on the vehicle?

MR. WOOD: Yes, I think the handles were added on somewhat later, I think, as a variation. I can't remember. It wasn't specific PSOS requirement at the time. That was probably after I left, I think.

MS. MCGRANN: That was after you left?

MR. WOOD: I think so, yes.

MS. MCGRANN: Are you aware of any other variations to the interior of the vehicle that were introduced outside of the PSOS after the selection of RTG?

MR. WOOD: Yes, there was the -- there was an interior call that was pushed into the double door area and there was like a T-bar that was inserted and raised.

MS. MCGRANN: Can you speak to the timing of those inclusions?

MR. WOOD: Off the top of my head, I can't. It's around about 2014, I think.

MS. MCGRANN: Was that late in the project to be including those changes, in your view?

MR. WOOD: Was that late? No, I don't think so because the original vehicle already had provision for a centre pole in the actual design, in some of the early design layouts. So it was always presented there. But I think the requirement was to have a number of handholds inside the vehicle, so the vehicle met that requirement. I think the pole was -- just provided some additional ability for people to sit around in an area or stand around in an area.

MS. MCGRANN: I've seen reference to the phrase tripole, is that what we're talking about?

MR. WOOD: Yes, that's correct. It's got three lobes on it.

MS. MCGRANN: To your knowledge, did the timing of the inclusion of the tripole have any impact on the manufacturing schedule for the trains?

MR. WOOD: I can't imagine it would because essentially if it was the original, it should have the base connections for it. The rest

is clamped onto the handles above and ceiling, and so there's no real impact as far as I know.

MS. MCGRANN: Thank you very much.

MS. MCLELLAN: Are you aware of -- we'll return back to your CV, but are you aware of how the vehicle was finally chosen by RTG or what that process was?

MR. WOOD: Yes, I am. Yes. So there was an assessment of the bid phase. RTG was quite clever. It provided a number of different car builders and a number of different cycling manufacturers and sort of mixed them. It had the ability to mix and match whoever it liked, so it gave itself a lot of flexibility, and I think at the end of the day, it went for -- it went for -- they chose Alstom and Thales, perfectly reputable manufacturers, and that was probably a good choice.

MS. MCLELLAN: So in terms of other projects you worked on, is that rare to mix and match vehicles with signalling systems?

MR. WOOD: No, in this type of bid you keep your options open when you're bidding. It gives you the flexibility then possibly bidding -- getting -- manufacturers are getting a more competitive edge.

MS. MCLELLAN: And in terms of other projects, what has been your experience with sort of mixing and matching, and have you seen that done before?

MR. WOOD: Yes, it's quite common to have a different vehicle manufacturer and a different signalling manufacturer. It's very common. I worked for a cycling manufacturer and we worked with a number of different car manufacturers and, indeed, Alstom as well.

MS. MCLELLAN: In terms of coordinating a different signalling manufacturer and a different intervening manufacturer and how they interact with one another, what's typically required?

MR. WOOD: It's quite a detailed process because your cycling system is safety critical and you have to marry that with a safety critical system in the vehicle. It needs some rigorous processes, and RTG would have to manage that themselves, but with the proper experienced people, that shouldn't be too onerous.

MS. MCLELLAN: And what would be involved in the rigorous process?

MR. WOOD: Yeah, it would be defining what the interfaces are, determining some of the

risks, the hazards associated with that system, whether the components are new or novel and really defining where those black boxes connect to one other. I'm simplifying somewhat, but in terms of defining what those interfaces are between the two parties.

MS. MCLELLAN: And are you aware if that work was done on this project in particular?

MR. WOOD: As far as I know it was. I'm not part -- I was never part of the testing, so I don't know how successful that marrying of the two systems was.

MS. MCLELLAN: What were you aware of in terms of the efforts for marrying the two systems?

MR. WOOD: Not very much because that would have been the management processes within RTG. They would have been managing the Alstom vehicle and also the interface with Thales. But I did get involved in some of the latter assessment parts with our safety assessors, but apart from that, not a great deal of depth in terms of what they were doing behind the scenes.

MS. MCLELLAN: And what was your involvement in the latter part that you referenced?

MR. WOOD: Yeah, I was -- I departed I think in the latter part of 2016. And I was off the project for a number of months, and then Richard had asked me to come back in to act as a safety over to liaison, so work between TUV, the safety auditor and the artifacts, the documents that RTG were producing.

MS. MCLELLAN: So I think we're going to turn to your later role in a minute, but just to close up your project accomplishments for your initial role, in terms of managing the evolution of the design scope through the new Infrastructure Ontario alternative financing procurement method, what did that involve?

MR. WOOD: Yeah, so I got involved with -- obviously there was a -- when I joined the overall project had a different slant on it. It was more of a design build, and it evolved into this IO, Infrastructure Ontario, project which was loosely based on a hospital design, and it required some thought in how to manipulate the existing data into the new project agreement and PSOS, the project operating specification.

MS. MCLELLAN: So what was involved in that process when the procurement model changed?

MR. WOOD: Yeah, it's a good question. The design build tends to be more prescriptive, and the challenge is then you take out the prescriptiveness and allow the flexibility for the proponent to design and take whatever route they would like within the boundaries of what they originally intended. And that's quite a hard process to go from very detailed specification to something more general given the flexibility and not constraining the actual proponent.

MS. MCLELLAN: What were the practical implications that you noticed on that change with respect to this project?

MR. WOOD: The practical parts of that were really to try and keep it as open and less detailed as possible and not lead the proponent into certain design decisions.

MS. MCLELLAN: What impact did that have on the City?

MR. WOOD: Well, apart from additional work to be able to go through and reassess what had been done before and clean up the overall PSOS to make it more flexible to give flexibility to the proponents.

MS. MCLELLAN: Ms. McGrann, I don't

know if you have any follow-up components on that piece.

MS. MCGRANN: Were there any areas in the PSOS where you thought to make the requirements less prescriptive and ultimately the requirements stated more prescriptive than you would have preferred?

MR. WOOD: Yeah, there's always a balance there, Ms. McGrann, on getting the right prescriptiveness, but given the flexibility. One of the things that we did put in later on, and it came in quite late, was that the decision earlier on to environment assessment was to have a light rail system and the decision was taken to the City to actually open up it to become a light metro. To give you an analogy, the sky train system has the same capacity as the City of Ottawa, and so the flexibility was there for a proponent to even propose a sky train type metro, light metro. So that gives them more flexibility in terms of what they could propose.

MS. MCGRANN: Did that proposal remain in the PSOS, that opportunity to propose a light metro as opposed to light rail vehicle?

MR. WOOD: Yeah. I can't remember how

the wording was done on that, but it just opened it up and I'm sure -- I think it was OTP that suggested some light sky train. I can't remember which bidder it was, but somebody came back with a light metro proposal.

MS. MCGRANN: With respect to the signalling system, was there any specific signalling provider that the City had in mind when designing the PSOS for the CBTC?

MR. WOOD: Not really. Not at all. I mean they're all very good companies. Some have got a better reputation than others. The idea was really to try and get as many bidders at the table to give the best -- really the best competitive advantage and to get the best responses back from the bidders.

MS. MCGRANN: So in your view and with your experience with CBT systems, did the PSOS as it pertained to the CBTC lean in favour of one particular supplier or one group of suppliers?

MR. WOOD: No, not at all. The terminology used in there was as open as possible to try and encompass all the different manufacturers.

MS. MCGRANN: Thank you very much.

MS. MCLELLAN: So moving on to the list of accomplishments that you assessed the preliminary design developed by Capital Transit Partners, what did that involve?

MR. WOOD: That is what I've just been saying, the preliminary design that was created, there was some initial work that CTP had actually done in terms of design itself and really was to take that and turn it into something which could be utilized for the PSOS itself. So some initial design work done and documentation.

MS. MCLELLAN: And what was that initial design work done? Like, what did that involve?

MR. WOOD: It would have been early studies on things. Certainly with vehicle -- there's the vehicle assessment. I'm trying to think. There was different types of methods of overhead catenary, I think. I'm struggling to go back that far, to be honest. There was just a bunch of data that was there. I think it was probably going to be used for the early design proposal for the design build.

MS. MCLELLAN: Okay. And then who was involved in assessing design following you looking

at the preliminary design?

MR. WOOD: Okay, so when we say assess the design, the assessment here, this is the data that feeds the PSOS. The project itself is really looking for compliance and not assessing design. It's to see how far RTG or the proponents would come in with a compliant design.

MS. MCLELLAN: Okay. You also list regular quality auditing and forensic analysis in your accomplishments. What does that entail?

MR. WOOD: Sure. So we did some -- obviously, as part of ISO 9001 process there would be -- we'd be raising NCR's, non conformance reports for certain things that were missing. That would be part of the auditing process the City would go through. There would be obviously as a result of raising the NCR and the findings of that, there would be a certain analysis that goes behind there in terms of why did it go wrong? Why did this happen? How can we correct that? And there could be internal NCR's or it could be external NCR's with RTG.

MS. MCLELLAN: Sorry, this is the NCR's are host selection of RTG's?

MR. WOOD: Exactly, yeah.

MS. MCLELLAN: And can you think of some examples of NCR's and what was done to solve those issues?

MR. WOOD: Off the top of my head, no, I can't. I'm just trying to think. No, I really can't remember that far back in detail.

MS. MCLELLAN: In terms of, you know, vehicle NCR's or anything like that?

MR. WOOD: The only thing I can remember that generated a lot of potential noncompliance areas was the initial review of the mockup, and I did a report for that, and there was some findings in there in terms of -- yeah, things of compliance, some of the things that were possibly compliant but had to be seen on the vehicle, and then some things that which you probably -- you just jogged my memory. For instance, the windshield wiper and its position on the windshield, et cetera. I don't think an NCR was raised on that, but it was raised on that report.

MS. MCLELLAN: And what were some of the additional findings from your report?

MR. WOOD: As I say, I'm just trying to go deep in my memory here. It would have been

things like the lock on the side of the sliding window on the cab, and things that had been asked for in the -- in the PSOS. They may have not been on the mockup because of the constraints of the mockup and what have you. But there may been there on the vehicle itself and on vehicle -- while the vehicle was manufactured.

MS. MCLELLAN: And what was done to ensure that the PSOS requirements that were not on the mockup were on the final vehicle that was actually run?

MR. WOOD: Apart from generating the report, I didn't have any control over that once it had been generated. I think this is a little bit before I left the City anyway. So that would have had to have been closed out at some point.

MS. MCLELLAN: Who did you address the report to or who would have received it?

MR. WOOD: OC Transpo had a copy of that. Richard Holder had a copy of that. And so it was in the right place to be dealt with.

MS. MCLELLAN: Okay. And can you think of an example today of different PSOS specifications that you had flagged in the report as not being there that did not make their way into

the final vehicle?

MR. WOOD: I wouldn't know because I wasn't part -- I didn't get to the first vehicle. I think I got on there once, so I've never actually been on the vehicle apart from being a passenger.

MS. MCLELLAN: Okay. Ms. McGrann, I don't know if you have any follow-up questions on that.

MS. MCGRANN: Were there any aspects of the RFP template, which I believe you said was based on a hospital project; is that right?

MR. WOOD: That's correct.

MS. MCGRANN: Were there any aspects of the RFP template that posed particular challenges when it was being adapted for the Light Rail Transit project?

MR. WOOD: Yes, I think there's obviously the -- a building is very different to a complex system that has safety involved in it. That was sort of known. We put enough words inside the PSOS to be able to sort of manage that. They did require some elaboration, of course, but some time was spent on how that would be achieved.

MS. MCGRANN: Did this PSOS speak at all to the need for systems integration that you've

described arising out of the intricacies of the system, et cetera?

MR. WOOD: Yeah, one of the earlier things I brought up was the system's assurance aspects of this. That was communicated very early on to Mr. Poon -- Mr. Allan Poon. There was some particular words that I created to go in there, and that was provided to CTP to add into the PSOS. I think what turned out to be -- I think there was a reference to the N50126, the European standard for safety, and also a reference to IEC15288 which is pretty much the de facto systems engineering standard.

MS. MCGRANN: A couple of questions. Allan Poon, is that a gentleman who works for Infrastructure Ontario?

MR. WOOD: That's correct.

MS. MCGRANN: I think you said IC5288; is that right?

MR. WOOD: IEC15288.

MS. MCGRANN: IEC?

MR. WOOD: International Electro Committee. I can't remember what the IEC stands for.

MS. MCGRANN: Could you explain to me

generally what that would require of somebody who is working on the project?

MR. WOOD: Yes, it's a known issue that complex projects require super management in terms of how the different disciplines are brought together. And the system assurance process makes sure that the disciplines don't rush ahead of one another. There's some assessment of how you move to the next stage of the project in terms of one discipline would leave another behind. It's a standard process for a lot of railway projects.

MS. MCGRANN: Was it your understanding that that particular standard was made a requirement of the RFP and subsequently the project agreement?

MR. WOOD: Yeah, with 50126 sort of forces that as well. It's more the safety standard, but it has a rigorous approach to system assurance as well and systems assurance planning. If you marry that with 15288, it becomes quite a solid and robust process to follow. It would be an industry standard really for railways.

MS. MCGRANN: I think you referred to that as a super management approach. Did you use that term?

MR. WOOD: I did use that, yeah. It's a very -- the safety critical world is quite a rigorous process. And I was trying to explain it to somebody. You're basically managing the same passengers as a Boeing 767. You're trying to bring it in safely into each station. I think the public are maybe not aware of the complexities behind that and how the companies are structured to deliver that safety.

MS. MCGRANN: Okay. And just to be clear, it's your understanding that both of those standards that you identified and NI50126 and IEC5288 are requirements in the project agreement, yes?

MR. WOOD: Yes definitely. 15282 I can't remember if it's in Schedule 7, I can't remember. It was -- yeah, it was some of the cities chose to use IEC15288, and I think 50126 was referenced in Schedule 152 part 4.

MS. MCGRANN: I apologize if you answered this question and I didn't catch it, but did you have any involvement in reviewing any aspect of the responses to the RFP for technical compliance with the areas that you were involved in drafting?

MR. WOOD: Yeah, I was involved in some of the assessment of the data that came in, yes.

MS. MCGRANN: Do you recall any particular concerns arising on your part in respect of the way that the parties proposed to manage the systems integration that we've been discussing?

MR. WOOD: Yeah, I think they were all particularly weak on this aspect.

MS. MCGRANN: Do you know if anything was done before the award of or the selection of the preferred proponent, let's say, to address the weakness with respect to systems integration in any of the proposals?

MR. WOOD: Honestly, I can't remember on the -- what was -- there were -- we had some RFI process going as part of the bid phase. There may have been questions and responses provided on that. This is going back a long way, and it was a very quick process over a number of weeks. There may have been questions on that that we responded.

MS. MCGRANN: Just for the sake of the record, RFI is a request for information?

MR. WOOD: Information, that's correct.

MS. MCGRANN: Were you involved at all in the negotiation of the project agreement or

advising on aspects of the project agreement that fell within your areas of expertise?

MR. WOOD: No. That was probably older than me. That was more looking at the technical aspects.

MS. MCGRANN: Can you speak at all to the approach that was taken to ensuring that the systems integration piece was included in the project agreement?

MR. WOOD: I did actually write to Mr. Poon and Mr. Charles Wheeler and had provided some words in terms of adding that into the PSOS.

MS. MCGRANN: Did you do that on your own initiative or were you asked to undertake that?

MR. WOOD: I did that on my own initiative because from other experiences of other projects, it's necessary for managing this type of complexity.

MS. MCGRANN: Do you know if the language that you suggested was included in the project agreement?

MR. WOOD: It wasn't included.

MS. MCGRANN: Did you have the opportunity to review what language was included in the project agreement in place of what you had

suggested?

MR. WOOD: No, I didn't have an opportunity to do that.

MS. MCGRANN: Okay. Following the award of the project agreement, did you do any work on reviewing or overseeing the systems integration work that was done by RTG on the project?

MR. WOOD: No, systems integration is a lot later after I'd left. It's mainly a physical process of people being on site and overseeing that. I wasn't involved in that at all.

MS. MCGRANN: Following the award of the project agreement, were the City and RTG producing the sort of over-arching system-wide documents that you would expect to see to help organize the work that would be done going forward?

MR. WOOD: No, I think some of the earlier information, the groundwork information, was not there.

MS. MCGRANN: Could you describe to me what you thought should have been there by way of groundwork information that was not?

MR. WOOD: Yeah, some -- the initial part of this is really the hazard analysis, the grounds analysis, and the requirements management

process to take what PSOS delivers and it probably provides a description of, I'm going to guess, like 30, 40 percent of what's required to give the flexibility. And RTG is supposed to fill in the rest and develop the system to accommodate the performance requirements.

MS. MCGRANN: Did it cause you any concern that that groundwork was not being done?

MR. WOOD: Yeah, I think we were chasing the requirements management for a number of months. It's not untypical for a project like this, the civil part tends to proceed very quickly. There's a lot of pressure for bids on the ground and get the shovel in the ground. It's not uncommon for that to happen.

MS. MCGRANN: Just so that I understand, your resume lists you as being involved in this project from 2011 to 2017. Were you involved in the project continually throughout, or were there periods of time in which you weren't involved?

MR. WOOD: Yeah, from the 2016 period to 2017 it's very patchy. I was just basically sort of filling in providing some sort of handover, if you like. I didn't start ramping up until the

end of the 2017 period in which I came in as the liaison.

MS. MCGRANN: And the chasing that you did, that you just described, were you successful in implementing or having implemented what you were hoping to get done there?

MR. WOOD: I'm sorry, could you say that again.

MS. MCGRANN: I can try. I'm trying to read my own handwriting here, unfortunately. I'd asked you about whether you had any concerns about the groundwork that you had described not being done, and I think that you said that you were chasing requirement management work for some time. So was what you were hoping to be put in place ultimately put in place?

MR. WOOD: Yes, it was. It came very late in the program, more later than would be expected, but it was done and some traceability was there. So there was a lot of activity towards the end of the project to fill in the gaps.

MS. MCGRANN: And in terms of gaps, gaps in what?

MR. WOOD: Gaps in the definition of the requirements. The hazard log had not matured

to a state where the information was available, so a lot more analysis had to happen. And, of course, the inclusion of the operator in that as well.

MS. MCGRANN: Are those areas really focussed on safety and safety management?

MR. WOOD: Yes, in the latter part of my role was with safety liaison. So I was looking at the transfer of residual risks that come from RTG that couldn't be accommodated in the design.

MS. MCGRANN: And those would then have to be accommodated by way of -- procedures?

MR. WOOD: Exactly right, yes.

MS. MCGRANN: With respect to --and I'm going to use some basic language here, so just bear with me. The integration between the CBTC and the trains, for example, during the time that you were working on the project, were the kinds of things in place that you would expect to see in place if the integration of the different providers on RTG's side for the train and the signalling system were going to be successful?

MR. WOOD: I wasn't part of that integration, so I wasn't aware of what was going on. I'd really sort of concluded by the end of the design phase, so I'm not party to that information.

MS. MCGRANN: So your work on signalling and traction power, did that also come to an end at the end of the --

MR. WOOD: Absolutely, in 2016, yeah.

MS. MCGRANN: Okay. Thank you very much for letting me interrupt.

MR. WOOD: No problem.

MS. MCLELLAN: Turning back to your project accomplishments, so we also have here involvement in the development of a preliminary engineering submission for tender, subsequent changes to the AFP method, and production of the content in the project agreement and project output specification. So can you break that down your involvement in the development of the preliminary engineering submission for tender; what did that involve?

MR. WOOD: Really just to make sure that the original from the engineer was sensible in terms of what we expected for light rail system. And really then to take that into and massage that to become more -- less prescriptive for the PSOS and the project agreement.

MS. MCLELLAN: And then in terms of the subsequent changes to the AFP method and the

production of the contents and the project agreement and the PSOS, how does that all come together?

MR. WOOD: Well, the AFP method here was, as I said, I think it was from hospital, don't quote me on that, it could be from another project, but obviously there was particular things that would be biased towards hospital, which would not be applicable to a safe rail system, if you like. So really, just the massaging of the words to provide that additional clarity.

MS. MCLELLAN: You mentioned that you worked on other light rail projects. Had you seen this happen before in terms of the AFP method and requirements translated from something like a hospital to light rail system?

MR. WOOD: Not generally. It's odd, but then it could be expected because the early AFP method that I helped produce was made successful and they wanted to follow that approach and convert it into something they could use for other transit projects.

MS. MCLELLAN: Okay. And then in terms of -- I think I touched on this, but it says you managed and assisted in the generation of the

vehicles specifications, CBTC, and train control system, communications and systems, power supply and overhead design. What did this involve?

MR. WOOD: Really, once again, we're going through the various subsystems of the PSOS. Once again, making sure they're clear and understandable. They've got the flexibility in there to allow different bidders to provide designs to accommodate this. And really, they're tidying them up. One of the important aspects of the writing of the PSOS and the requirements is that they become something that's easily testable for clarity and the actual wording is useful for a test output, if you want.

MS. MCLELLAN: I think we discussed the vehicle mockup. And I believe it says you managed the compliance review of the vehicle and systems components including full-sized vehicle mockup. So what did that involve?

MR. WOOD: So we -- the mockup for public viewing, we did some early work with Alstom for the ability -- I think I mentioned that. One of the concerns was that the floor -- the floor is slightly undulating. The original premise was that it would be a flat floor. The constraints of

having a low floor vehicle and the high speed meant there were technical difficulties in producing that. And there were concerns that the ability impaired would be a disadvantage in terms of some of the slopes. So we went through a fairly rigorous process in trying to understand what that was. I think we went to an AOC committee. We had some accessibility groups who really gave us the thumbs up in terms of available design and how that evolved. So that was really just managing -- managing the interior and the expectations of all the ridership, really.

MS. MCLELLAN: And then in terms of being a liaison with and between OC Transpo and RTM, what did that involve?

MR. WOOD: Yes, so I think I sort of alluded that as part of the liaison process I was looking at the residual risks that came out of the hazard log. They would be primarily focussed on procedure -- procedure and signed operating procedures, SOPs, which would be either taken by RTM as part of their maintenance regime or as the operator, as OC Transpo's part of their standard operating procedures, and really to get some clarity as to where they would be, where they would

sit in terms of documentation and get agreement from those two parties to make sure they'd been done.

MS. MCLELLAN: And what did human factors design -- let's start with --

MR. WOOD: Human factors was really how the desk went together, how people interacted with the overall system.

MS. MCLELLAN: And how did you find that to be, generally?

MR. WOOD: Human factors was done fairly early on the vehicle cab design. There was quite a lot of discussion with OC Transpo over that. I think there was sticking points on the seats area. I'm not sure how that got resolved. I left by -- in the middle of that somewhere. But in terms of like safety and security, I was working with the security lead in the office who was managing the security on the side of that. There was always some sort of crossover between safety and security, some of the mitigations are dealt with by both. So that's really where I fit in is that liaison between those parties.

MS. MCLELLAN: And when an issue arose or there was a change required and it was raised by

either party and you had to report that back and forth, how was that process dealt with?

MR. WOOD: Change at what point in the project? In the design phase?

MS. MCLELLAN: Yes.

MR. WOOD: Yeah, it depends on the change itself. Normally it's done through a variation process. Some of the changes were basically interpretation changes and clarifications from the PSOS. Nothing is perfect, so there was some additional wording that goes into that so that for testing then you've got the ability to have that surety of what the wording would be. Some would zero cost variations, some had money attached to them and cost and scheduling.

MS. MCLELLAN: Can you think of any of the changes that were implemented to the PSOS as a result of this?

MR. WOOD: Yeah, I can think of one. There was a big fire, I can't remember what the panel was called, but there was a fire panel for the tunnel. There was a lot of additional wording that had to go in to describe its function. That was probably the biggest changes that I'd seen. I'm not sure if there was a cost variation

implication of that, I can't remember, but there was certainly some wording changes within the PSOS.

MS. MCLELLAN: What were the wording changes that -- what was required?

MR. WOOD: It was description of what the thing did. I think there was no real description originally, and there was additional requirements from fire, police, in terms of CCTV. That's closed circuit TV coverage and a screen there.

MS. MCLELLAN: So we'll move on to your role from 2017 to 2020, and where it's listed here on your CV that you are the safety coordinator. So what did that role just generally entail?

MR. WOOD: Yeah, as I was saying, the safety coordinator I was just working between RTG. There was the hazard log. The way that the hazard log is closed is that your -- the residual risks of maintenance and operations have to be covered somehow through procedure. And the idea was really to understand the design and accommodate it for the majority of the risk. There's -- to go back to where this comes from, there is a design precedence of order in EN50126 which says you must design as best you possibly can and then anything residual

then gets mocked up by procedures and people to deal with that. So the agreement then would be going through with RTM and OC Transpo and getting agreement there that they're quite happy to incorporate that as part of the standard operating procedures.

MS. MCLELLAN: And how did your role evolve post RSA?

MR. WOOD: I wasn't there post RSA.

MS. MCLELLAN: Doesn't it say here that you were in this role to 2020?

MR. WOOD: Well, no, that's Finch West.

MS. MCLELLAN: Sorry.

MR. WOOD: I see it there.

MS. MCLELLAN: Okay.

MR. WOOD: 2017. The date is missing on that.

MS. MCLELLAN: Okay. And in terms of liaising with TUV and RTG to obtain the final safety certification on the project, what did that involve?

MR. WOOD: As you may be aware, TUV has independent safety -- I'm trying to think of what the acronym is on this project. The different assessor provides an opinion that the system is

safe to operate. To get to that opinion, a number of things have to be in place called the artifacts, the safety artifacts. TUV was expecting a series of documents to be produced by RTG, and TUV was going through those documents, providing opinion. It has a checklist of things it goes through at which point it then goes to the independent certifier and basically gives a thumbs up for payment.

MS. MCLELLAN: Are you aware if all the items on the checklist were certified or satisfied, pardon me?

MR. WOOD: As far as I remember, they were all signed off. There were obviously issues with some findings, et cetera. There were operational restrictions that came out of the design, being no different than any other project. I can't think of anything that really would have stopped the final issuance of the safety certificate. Those two would have actually raised issues before allowing that.

MS. MCLELLAN: How were the items that were deficient, how was that resolved?

MR. WOOD: I think it would have been more information, further analysis by the

professionals of record, further data to support that. That's generally how it went. If TUV weren't happy, we'd have to go back and work with RTG to try and generate more information.

MS. MCLELLAN: What was certified from this process?

MR. WOOD: The entire project is certified through the safety side, yeah.

MS. MCLELLAN: And in terms of the certification, did this mean that all required documentation existed in terms of safety for the project?

MR. WOOD: There was a map of safety documentation that there wasn't in the beginning. There was a map created. It maybe two years towards the end of the project, and RTG had faithfully reproduced the documentation that it had said it would do to satisfy TUV.

MS. MCLELLAN: How long did that take? Was there a delay?

MR. WOOD: I wouldn't say there was a delay. It was an onerous delivery. I think it was about a year and a half to get that information together.

MS. MCLELLAN: Is that typical for what

you've seen on other projects?

MR. WOOD: Normally a lot of the documentation started earlier. And so there was a bit of retrospective action in producing that information.

MS. MCLELLAN: And what was the impact of the information having to be produced retrospectively?

MR. WOOD: Just more reassessment of some of the designs.

MS. MCLELLAN: Did that lead to any changes in the documentation, any differences than what you'd usually see?

MR. WOOD: No doubt it would have been similar to all documents. There would have been changes to the documents for further elaboration to attain some of the data to support the assumptions in there.

MS. MCLELLAN: So I think you've done this, but just if you could just walk us through the process for obtaining the final safety certification on the project from TUV to going to the certifier?

MR. WOOD: As I said, there was a number of artifacts, documents, safety documents

that were produced. There was a list. I provided that list of documents or documents that came in to the various parties, and that would have included OC Transpo. Some of the other leads were then the rail implementation office, and I would have collated comments from them and provided those back to RTG. RTG would have included those comments or elaborated on those comments and provided those documents at which point then RTG would have supplied those documents to the safety assessor for effectively, I think it was a statement of no objection in terms of how -- it's not approval as such. It's a statement of no objection.

MS. MCLELLAN: In terms of comments from the rail implementation office and OC Transpo that went to RTG, were those comments always integrated?

MR. WOOD: Yes, that's right. They were. And that was tracked through a matrix as well.

MS. MCLELLAN: Did you have any concerns with that process in terms of how the safety certification and documentation turned out?

MR. WOOD: No, not really. I mean they had a fairly reputable person or team at RTG

putting it together and respected safety assessor, and the two interacted fairly well in terms of understanding their needs, and RTG delivered that information to them, and I think that was fairly successful.

MS. MCLELLAN: So I just want to go back in time that I wanted to deal with in terms of your earlier role.

So subcontractor cost management and budgeting; what did that involve?

MR. WOOD: Yeah, so every month I would get figures from CTP for the different leads, and again track that against budget and see if there were any discrepancies in terms of charging for time and expenses generally for the work and activity that happened.

MS. MCLELLAN: And how were budget constraints communicated?

MR. WOOD: Budget constraints for me were just -- I had a target to meet, and I would map that -- map the budget expenditure and then challenge CTP where I thought they expended more time than they should have done. That's where the experience comes into it to say well, you know, what you did was probably only a day's work. It's

not a week's work. It's that typical sort of challenge.

MS. MCLELLAN: So how were those constraints resolved in the end?

MR. WOOD: I think the constraints would go back through the commercial office for the rail implementation office. So some of those would be discussed between CTP -- the heads of CTP.

MS. MCLELLAN: Okay. And then in terms of project schedule assessment, what did that involve.

MR. WOOD: There's an overall project schedule, and I would track activities against certain milestones to make sure they made sense and they were just happening in the right order and they're in the right time scale.

MS. MCLELLAN: Okay, and then what happened when there were changes that needed to be made to the project schedule or changes were communicated to you in the project schedule?

MR. WOOD: Okay, so I would look at the overall schedule and see if some of the milestones were realistic, and I'd report back where I thought they were slippages in terms of the overall milestones and delivery.

MS. MCLELLAN: Generally how did you -- did you find the milestones were realistic?

MR. WOOD: Difficult to say. Certainly the mile -- I would track a milestone, and I would track it sort of its changeover time. So if there were things that would happen a certain week, then if there was a slippage I would be tracking the slippages for the X number of weeks that that would carry on for.

MS. MCLELLAN: Who did you report the slippages to?

MR. WOOD: To Mr. Holder and I think Mr. Craig as well.

MS. MCLELLAN: And do you recall what some of the times where there were slippages?

MR. WOOD: Yeah, right around 2016. Somewhere around there.

MS. MCLELLAN: And what was the direction from the City in terms of availability for slippages and time or for their time pressures that you felt they faced?

MR. WOOD: It was reported. So I had a very good rapport with the planning department and the -- we regularly set up the schedule to monitor certain aspects and that would have all gone

through the planning meetings that they had, so if I raised any issues, that would have been escalated upwards.

MS. MCLELLAN: And can you think of any instances where that happened?

MR. WOOD: Yeah, I think post the operating maintenance storage facility payments I was particularly interested in the system development and how that was impacted. And so I set up a number of areas in the planning reporting to keep track of certain aspects of subsystems as they -- as they were produced.

MS. MCLELLAN: I have a few general questions, so I'll ask Ms. McGrann if she has any follow-up questions.

MS. MCGRANN: Just a couple. With respect to the operating maintenance storage facility, are you speaking about Belfast yard?

MR. WOOD: Yes.

MS. MCGRANN: I think it's also referred to as the maintenance and storage facility, which is what you said. Were you looking at the automation of that yard at all?

MR. WOOD: Obviously, ultimately, yes because of CBTC system was supposed to provide the

full automation for that. That hadn't materialized even at the very early stage.

MS. MCGRANN: When you say that hadn't materialized at an early stage, was it behind the anticipated schedule, the schedule that had been provided to you?

MR. WOOD: I'd never -- I think I raised early issues that didn't seem to be on the radar at all for the automation of the yard. One of the things I was concerned about on the OSF was the systems components and that not materializing in that time, but I wouldn't have expected automation to go until very, very late in the project anyway because it's mainly quite a manually intensive area at the very end of the project and then it's cut over into automation, and that's beyond the time I was there anyway.

MS. MCGRANN: With respect to the scheduling work that you were doing, I take it that you were reviewing information that ITG provided to help your scheduled tracking; is that right?

MR. WOOD: That's right, yeah. I'd use their project schedule to their milestones and then I work from that and create my own sheets or work with Michael Craig who would generate more

milestones for me and keep that tracked through the P3 planning software.

MS. MCGRANN: At any point during your work on the scheduling, did your scheduling work begin to or stop matching up with the schedule that RTG was providing?

MR. WOOD: Yeah, but that's fairly common for a project like this. It ebbs and flows in terms of what's delivered. There's a lot of focus and, of course, then things like the tunnel collapse and things put a real wrench in the works in terms of overall planning.

MS. MCGRANN: When you refer to the tunnel collapsing, are you talking about the Rideau Street sinkhole that took place in June of 2016?

MR. WOOD: Yes.

MS. MCGRANN: You say that it's normal for the work that you were doing on the scheduling to disagree with the schedule that's being provided by the contractor; is that right?

MR. WOOD: Yes, that's pretty common, yeah.

MS. MCGRANN: At any point during the work that you were doing, did the mismatches between your scheduling work and the schedule being

provided by RTG become abnormal in your experience or an area of concern?

MR. WOOD: Yes, I think I -- any schedule is a concern. But it doesn't mean that RTG are not managing the risk within themselves, so that's not immediately visible. All we can do is really report on the slippage and say this is three months slippage, and that's quite a lot of time to make up. All you can do is make that visible to the City.

MS. MCGRANN: I take it you did make that visible to the City?

MR. WOOD: That's right, I did.

MS. MCGRANN: Did you do any work with a group of external consultants who were brought in and had been referred to as the independent assessment team?

MR. WOOD: By that do you meant SEMP?

MS. MCGRANN: I don't mean SEMP but we will have some questions about SEMP, I think. I believe that these individuals were from, hopefully I get this right, STV brought in to help assess the schedule that was being provided by RTG, for example.

MR. WOOD: Yeah, I think I provided

some metrics on some of the artifacts that I was providing into whatever they were doing and provided some updates, but apart from that, no, I didn't have much interaction with those.

MS. MCGRANN: With respect to SEMP, I think that that was a company that was brought in by RTG; is that right?

MR. WOOD: That's correct, yes.

MS. MCGRANN: I think they were brought in to do an overall systems engineering health check; have I got that right?

MR. WOOD: That's correct, yeah.

MS. MCGRANN: Can you explain what would be involved in that health check?

MR. WOOD: Yes, SEMP obviously are quite experienced on the systems engineering approach -- systems assurance processes. There's a set formula which works in terms of what needs to be done and when. Their health check would be looking at when those things were done and what was produced. From that, they would take a view as to what the effectiveness of that -- the overall processes were and where the gaps would be in which RTG had to plug.

MS. MCGRANN: Did you have any

involvement or any interaction with SEMP in the work that they did?

MR. WOOD: Not entirely in the work, but certainly in the reporting and interaction with RTG. There was lot of reporting there. Some attendances what they called, day in the life of analysis. It's a process in which they go through an overall valuation of design through -- just walking people through what would happen in the day, and that was recorded, and that's part of the input into the safety assessment.

MS. MCGRANN: So you're there or you're interacting with them in your role -- in your safety role?

MR. WOOD: Yeah, that's right. So they gave me a list of documentation that they would produce. I would track that against the time schedules and just request updates of that on a biweekly basis and some regular checks, check-ins with a lead of that, and an overall assessment of where we are. So we'd make sure that we get the right documentation to -- for assessment.

MS. MCGRANN: Can I circle back to your comment about the maintenance and storage facility for a second.

MR. WOOD: Yeah.

MS. MCGRANN: What in particular were you looking at in terms of the maintenance and storage facility?

MR. WOOD: When was I looking at that? At the very -- I was around at the time of its -- the first payment of the OMSF.

MS. MCGRANN: What was the nature of your inquiry into that particular milestone?

MR. WOOD: Nothing. At that time I was interested in how, as you're aware, that the part of the control centres is in the OMSF and some of the systems equipment rooms were in there, so I was interested to see what was going in at the time, what would be available at the time of payment.

MS. MCGRANN: Any mismatches that you saw between what you expected would be available at the time of that milestone payment and what was actually available?

MR. WOOD: I think there were empty equipment cabinets and there were cables, et cetera. The equipment wasn't there at the time. That is not uncommon either. It depends on where it's stored, et cetera, and it could be just a phasing of where -- or what needs to be done by the

subcontractors.

MS. MCGRANN: Any particular concerns raised on your part by the state or the status of the MSF at the time of the milestone payment?

MR. WOOD: Not really. I think there was a need to get the OMSF into a position where Alstom could move in, and I think there was a bit of pressure in terms of having that available for them to conduct their work in.

MS. MCGRANN: How did that pressure translate into steps taken on the ground at the MSF, do you think?

MR. WOOD: I don't know -- how do you mean by that?

MS. MCGRANN: I'm trying to understand -- so you're looking at the state of the MSF through the lens of whether a milestone payment should be or will be made; is that right?

MR. WOOD: I'm not involved in the milestone payments as such but, however, I'm interested in the status of the MSF and what was in there at the time. So I would be expecting some more equipment in there. It could be the fact that it wasn't delivered or it wasn't in a status of being designed yet, so really all I'm interested in

is where we were expected to be and where they currently were at the time.

MS. MCGRANN: So you're looking at this strictly from a where is the schedule and where is --

MR. WOOD: Exactly. Yeah.

MS. MCGRANN: And did the OMSF slip off the project schedule at any point in time while you were looking at the scheduling?

MR. WOOD: No, I don't think so. It was delivered on time. I think -- yeah, I don't think there's anything untoward. It had to be there because of the needs for Alstrom to manufacture the vehicles.

MS. MCGRANN: Can we take a brief break.

(ADJOURNMENT)

MS. MCLELLAN: So Mr. Wood, are you familiar with the safety auditor who was overseeing stage 1?

MR. WOOD: The safety auditor, I am familiar with it, yes, with two.

MS. MCLELLAN: Did you work with the safety auditor at all?

MR. WOOD: Yes, I did, yes.

MS. MCLELLAN: And what did your work entail?

MR. WOOD: My work was liaising with a gentleman named Sergio Manaliti (phonetic) and I was basically being the City's voice for interaction between RTG and to provide the data to support the OC Transpo aspect for 42.

MS. MCLELLAN: And what can you recall were -- or what were some of the issues or main focuses that came out of your involvement with dealing with the safety auditor?

MR. WOOD: Nothing that really comes to mind. Obviously, the biggest challenge first of all was doing a lot of -- getting a lot of data together. A lot of the design information packaged up to support the safety auditor at the very end. I use the word safety assessor. That was the safety auditor. I've forgotten there's different terminology in different contracts.

MS. MCLELLAN: And then did this involve the completion or the circumstances around the safety audit plan?

MR. WOOD: No, the safety audit plan is generated by the then safety auditor. That's their process in which they conduct themselves.

MS. MCLELLAN: And how were you involved in the completion of the safety audit plan?

MR. WOOD: I had no involvement with the safety audit plan apart from just, obviously monitoring the ISO was following that.

MS. MCLELLAN: And then in terms of the process, so was the process that you received feedback from TUV, I think you're saying T-U-V, and you received feedback from TUV and that went to OC Transpo, or how did that work?

MR. WOOD: Yeah, generally there was a request that come out of TUV. Because of the independent nature, you don't get too involved with them. They are a law unto themselves as much as they can be. But there are requests for the gaps for, for instance, if a hazard had to be mitigated by standard operating proceeding, I would go and ask OC Transpo to either create it or provide that evidence to support the mitigation.

MS. MCLELLAN: And can you think of some examples where that happened?

MR. WOOD: Probably -- I think probably training evacuation would be one of them.

MS. MCLELLAN: Can you expand on that?

MR. WOOD: Well, in terms of getting passengers safely off the vehicle into a safe place of refuge.

MS. MCLELLAN: So how was that issue dealt with?

MR. WOOD: It would be written up as a standard operating procedure possibly in the OC Transpo operating manual or as a subset of that. And that would also include things like possible training. I wasn't involved in any of those training exercises, but probably the recommendation, something like that, would be you would exercise a proper evacuation of the vehicle with the passengers.

MS. MCLELLAN: And were there any other specific areas of evaluation that required a need for a change in operating procedures out of TUV's assessment and the safety auditor's assessment?

MR. WOOD: There are always tweaks of things and clarity that there was need to provide. That's pretty standard on all these type of things. There would be further elaboration by OC Transpo or there may be some weak words which had to be described better in terms of who the liaison between RTM, because obviously the RTM and OC

Transpo would have to work together in maybe an incident involved like fire services or emergency services, so that sort of detail would go in.

MS. MCLELLAN: I don't know if Ms. McGrann has any follow-up questions on that.

MS. MCGRANN: No questions.

MS. MCLELLAN: Were you involved in the development of the engineering safety assurance case?

MR. WOOD: No, the ESAC is generated by SEMP for RTG.

MS. MCLELLAN: So you didn't have any involvement?

MR. WOOD: Yeah, I did have involvement. I was sort of shepherding those documentation to the ISA.

MS. MCLELLAN: So what did that involve in terms of shepherding documents?

MR. WOOD: Just passing that to the various people that required, the stakeholders. So that would be the duty holder would be which OC Transpo and RTM.

MS. MCLELLAN: I understand there were Confederation line safety meetings. Did you attend those?

MR. WOOD: Yeah, I did, but primarily with the ISA.

MS. MCLELLAN: And the ISA is?

MR. WOOD: The independent safety auditor.

MS. MCLELLAN: So I know that they happened monthly. Do you recall sort of the main areas of focus out of those meetings?

MR. WOOD: They would have been looking at all the various documents and the status of that. So reporting on that. I think there were biweekly ones towards the end because there was such a volume and pressure to get this stuff wrapped up for the ISA, so there was a need to keep the ISA fed with that information.

MS. MCLELLAN: By the end, what time frame do you need?

MR. WOOD: Before RSA.

MS. MCLELLAN: So summer 2019?

MR. WOOD: I couldn't quote the date for the moment. I think it was a bit later than that. I can't remember the certifications.

MS. MCLELLAN: That's okay. So at these biweekly meetings, you would be looking at documentation leading up to RSA, and what was the

process in terms of feedback from these meetings?

MR. WOOD: So the meeting minutes were recorded by SEMP directly. And there would be certain specific actions for things to be done by both RTC, OTM, or OC Transpo.

MS. MCLELLAN: Do you recall of any instances where certain actions -- there was an issue with certain actions that were proposed or certain actions weren't implemented?

MR. WOOD: No because we were going through systematically to try and get closure of the mitigations. There may have been some things open towards the end, and that may have fed into the operational restrictions document, and there may have been things that had to be temporary measures because certain aspects of the designs had not been fully evaluated or fully functioning.

MS. MCLELLAN: Did that concern you that certain aspects of the design hadn't been fully formulated so close to RSA or leading up to the RSA?

MR. WOOD: It depends on the nature of the severity of that. If it's really safety critical then obviously then that becomes a big issue, but if they're minor things that are worked

around, that's acceptable. You know, the duty holder is accepting to that process as well.

MS. MCLELLAN: Can you think of any safety critical examples that came up?

MR. WOOD: Yeah, I think I can remember one of them which was the end gates on the platform. I think the risk of CCTV cameras, I think that was one of the issues that manifested itself very later on.

MS. MCLELLAN: Can you expand a bit on what happened there?

MR. WOOD: Yeah, didn't they put a work around for some people blowing whistles or something for the train to leave the station?

MS. MCLELLAN: So in terms of -- why don't you just provide your recollection of what happened.

MR. WOOD: Well, I'm -- I don't recall that. All I remember is what I read in the hazard log in terms of the work around.

MS. MCLELLAN: And what was done to resolve this safety critical event?

MR. WOOD: I'm not sure. I wasn't around when -- there would have been outstanding action I suspect after RSA.

MS. MCLELLAN: But you're not aware of what was done?

MR. WOOD: I'm not aware, no.

MS. MCLELLAN: Ms. McGrann, do you have any questions on that point?

MS. MCGRANN: I do not, thank you.

MS. MCLELLAN: So just turning -- actually, first of all did you have any involvement in stage 2?

MR. WOOD: No, apart from bidding for it.

MS. MCLELLAN: And in terms of -- so just walking back to pre-procurement, you supported the City in the development of its procurement strategy?

MR. WOOD: Yeah.

MS. MCLELLAN: Did you take over in your role for anyone?

MR. WOOD: Sorry, did I take over my role?

MS. MCLELLAN: Yes, I think we discussed this. In 2011 you took over from Mr. Jones?

MR. WOOD: Mr. Jones. That's right, yes.

MS. MCLELLAN: And then I think we discussed who you reported to. So what had been decided about the project and the procurement model when you began your work?

MR. WOOD: I think the only decision was there was a DBFM. I think that was a decision not in my court to make. That was taken -- yeah, I don't know where that was made.

MS. MCLELLAN: Were you ever provided with any reason for why that model was chosen?

MR. WOOD: No, none at all.

MS. MCLELLAN: Did the DBFM model have any practical implication or impact on safety requirements?

MR. WOOD: No, not -- well, I wasn't managing safety anyway. The safety lead was dealing with that, but anything with DBFM means that the operational component is separated from the project, which means it needs a little bit more scrutiny in terms of how that's managed and how that comes into the project.

MS. MCLELLAN: Okay. And so were you involved with the approach to the procurement of rolling stock?

MR. WOOD: The approach to the

procurement of rolling stock in terms of how do you mean?

MS. MCLELLAN: The selection of the successful proponent and the rolling stock that was chosen.

MR. WOOD: That was RTG to make that decision. That was in their court.

MS. MCLELLAN: And in terms of the City's key requirements, I think we've covered this, but just generally you were involved in developing the safety requirements and the standards?

MR. WOOD: I was involved in the safety requirements and standards?

MS. MCLELLAN: In developing them.

MR. WOOD: No. All I was really providing is best practice for the railway systems which had been typically used before with some success.

MS. MCLELLAN: So the focus of the best practices, what was that?

MR. WOOD: Well, really using system engineering techniques.

MS. MCLELLAN: Were there any gaps or different requirements that you saw in your work on

stage 1 from other similar projects?

MR. WOOD: No, I couldn't say there was any gaps in there at all. I think it was fairly comprehensive in what it was dealing with. Some of that was -- in terms of the overall schedule for -- Schedule 20 for the pain share gain share techniques for actually stimulating performance. I think that was relatively well done.

MS. MCLELLAN: Were you involved in the development of a safety management system?

MR. WOOD: No.

MS. MCLELLAN: And then I think you answered this before but the PSOS requirements for the project, generally were they more or less prescriptive than similar projects that you've worked on?

MR. WOOD: They were a little bit more prescriptive, and I think that was a result of the change of models earlier on. I don't think that -- that was none. And as I said, there was some time spent in trying to make them as open as possible.

MS. MCLELLAN: And how would the change in models lead to a more prescriptive PSOS requirements?

MR. WOOD: No, I think the original

design build would have been more prescriptive because you're affecting design specification. Here you're trying to achieve a performance specification, which is very different.

MS. MCLELLAN: In terms of speed requirements, were you involved with speed requirements on the project?

MR. WOOD: The speed -- in the vehicle speed you mean?

MS. MCLELLAN: Yes.

MR. WOOD: The speed requirement comes from the overall performance, the end to end performance in the carriage of people. So it depends on the track layer, the vehicle itself. So I don't think there was any boundaries specified on this. Obviously, getting people from A to B as quickly as possible is a goal for anybody and as safely as possible.

MS. MCLELLAN: Do you remember in terms of the speed requirements assessing against a chosen route to determine if the requirements were feasible or appropriate?

MR. WOOD: No, I think that was a model somewhere else. There were a number of different routes and alignments chosen, and I think there was

probably a bit of latitude there in terms of what the performance specification would achieve.

MS. MCLELLAN: Was there any intermingling of safety requirements with speed requirements?

MR. WOOD: Speed and safety are pretty much close bedfellows, I would say, but moreover, stopping the vehicle is a more important one, so yeah, speed, deceleration, acceleration are all related to safety.

MS. MCLELLAN: I think we discussed the signalling system and the consideration of interface risk with the signalling system being from a different source than the vehicle provider.

MR. WOOD: M-hm.

MS. MCLELLAN: Were there any changes to the PSOS for rolling stock after the RFP was released?

MR. WOOD: I can't remember off the top of my head. I think there may have been some elaboration of some requirements from the RFIO process, if I remember correctly, but I don't think the PSOS would have been changed because it would have been too risky at that time.

MS. MCLELLAN: Do you remember which

areas there was -- what were the areas of the elaboration?

MR. WOOD: I think it may have been ridership and things like that there was a clarification of that.

MS. MCLELLAN: Can you speak further to that or provide further detail?

MR. WOOD: Yeah. As you well may be aware, the system has to accommodate the ridership capacity for the BRT and beyond. It has to double ridership effectively, and there may have been some questions about certain areas for ridership that had to be further expanded upon.

MS. MCLELLAN: Do you remember what those certain areas were?

MR. WOOD: Yeah, may have been Pendersey because I think Pendersey was a big sink of ridership and a potential growth area for the City as well.

MS. MCLELLAN: And then were there any changes to reporting structure during the procurement phase with respect to your role?

MR. WOOD: During the procurement phase? Apart from Mr. Jones departing, I'm not sure if there was a restructuring at that time.

There was some later in 2016, but no, I can't remember John -- Mr. Jensen had left. Mr. Craig had taken temporarily that position, I think, in that case, and then we received a new director afterwards. I can't remember exact dates and when people were shuffled around.

MS. MCLELLAN: And I think you spoke to a restructuring in 2016?

MR. WOOD: Yes, that's right. That's when Richard Holder took over Gary Craig's direct report to -- in terms of systems and vehicles, et cetera.

MS. MCLELLAN: And was there any change -- was there any, like, change in the way that reporting or just the general structure functioned with the transition from Gary Craig to Richard Holder?

MR. WOOD: Yeah, there was a number of layers added into the organization, for whatever reason, I don't know. And a number of different segregation, different disciplines.

MS. MCLELLAN: And are you aware of why those changes were implemented?

MR. WOOD: No idea at all.

MS. MCLELLAN: In the post procurement

stage in construction and manufacturing, how did your role change or how were you involved?

MR. WOOD: In the post procurement? Well, more or less as the interactional systems and vehicle side with RTG.

MS. MCLELLAN: So how did your role change then?

MR. WOOD: It didn't really change at all.

MS. MCLELLAN: You were just having to interact with RTG, I guess, would be the change?

MR. WOOD: Exactly. I had a counterpart at RTG, and we worked closely together. The aspect of the PPP as a partnership is try to keep that partnership rolling as much as possible as you can with the commercial constraints.

MS. MCLELLAN: Who did you predominantly deal with at RTG?

MR. WOOD: I dealt predominantly with Mr. Jacques Bergeron. And yeah, I think that's probably my main point of contact.

MS. MCLELLAN: And you mentioned that you were in your role trying to keep the partnership going; what do you mean by that?

MR. WOOD: One of the aspects of a PPP

is that there's always a conflict between sort of a client subcontractor relationship and delineating between that and a partnership in terms of helping both partners come to a conclusion -- satisfactory conclusion. It's a little bit different mindset, and it's important that, you know, the project's conducted that way.

MS. MCLELLAN: Did you see any of those potential conflicts in your work that can rise from that type of situation?

MR. WOOD: There's always conflict in terms of different opinions in terms of interpretation. That has to be balanced with in terms of the law, in terms of engineering law, in terms of how that's interpreted.

MS. MCLELLAN: Were you ever involved in managing or resolving any of those conflicts?

MR. WOOD: More technical disagreements, perhaps, interpretation. There's quite a lot of those things, but generally, yes.

MS. MCLELLAN: And what were some examples of those technical disagreements?

MR. WOOD: I think one -- I remember one of them being the vehicle in terms of the -- there's a thing called Schedule 13, which is the

extracts for the vehicle, and there was an offer by Alstom to provide a high efficient motor for the vehicle and Alstom came back with a different version of the motor, which is slightly less efficient, but that's the advantage and disadvantage. So there's an interpretation issue in terms of how Schedule 13 was interpreted and what was finally offered.

MS. MCLELLAN: So how was that resolved in terms of Alstom coming up with this less efficient motor?

MR. WOOD: Well, Alstom eventually went for the less efficient motor. That has some implications. There may be some ease of manufacture and also ease of obtainment of the motor itself, so there may be a tradeoff between a more efficient motor that has difficult parts to get ahold of versus something which is off the shelf, and that may be the balance there.

MS. MCLELLAN: And how was that particular disagreement handled between RTG and the City?

MR. WOOD: The disagreement was through discussion at some of the technical groups. In terms of the interpretation, I think schedule -- I

think something happened in schedule by in terms of how it's rewritten. I think there was a conflict between Schedule 15(2) part 4 and Schedule 13. Obviously Schedule 13 is the precedence, and I think commercial decision was made to take the 15(2) part 4 version.

MS. MCLELLAN: And would there be any safety or reliability impacts with the less efficient motor?

MR. WOOD: No, not at all. More power consumption but marginal. The trade off, as I said, would be the availability of spare components, perhaps.

MS. MCLELLAN: Do you know why Alstom chose to go this route in terms of the motor they chose?

MR. WOOD: No, it could be manufacturing, and the more efficient motor uses a rare magnet and may be very difficult to get ahold of, and it may have been a good choice at this time.

MS. MCLELLAN: Ms. McGrann, I don't know if you have any questions?

MS. MCGRANN: I do not.

MS. MCLELLAN: In terms of post RSA,

did anybody take over your role?

MR. WOOD: I don't know. I don't know who was there after me.

MS. MCLELLAN: Okay. And then in terms of the project budget, what were you told about the budget when you began your work?

MR. WOOD: I was given some numbers in terms of what was allocated for those disciplines, and I tried to manage the time expenditure within that as best I could.

MS. MCLELLAN: And how was subcontractor budget management handled or factored in?

MR. WOOD: CTP traditionally brought the monthly total of hours, et cetera, against the disciplines and then provided that, and I would just total that up and provide that to the City.

MS. MCLELLAN: I think you spoke to this before, but if the hours were excessive, how was that resolved? Did you often have to write hours down or speak with CTP about writing hours down?

MR. WOOD: Yeah. As I said, I would challenge the management, the manager of that saying in question why was X number of hours

expended at this point when I was thinking like two hours would have been sufficient and there was more expended. There may be good reason for it but that would be the sort of interaction I would have.

MS. MCLELLAN: And did that have any impact on the City in your relationship with CTP?

MR. WOOD: No, CTP were very professional guys. They would go back and analyse that, and they would come back with a report based on, you know, in terms of what they expended whether it was genuine or mistake.

MS. MCLELLAN: And just generally, let's start with the budget overall. Did you feel that the budget for the project was realistic?

MR. WOOD: I never really had a lot of involvement with the overall budget of the project. Yeah, it's difficult to say. The budget, you know, you're building a tunnel. So it's very similar to Edmonton, so very costly initially for building a system like this. I can't give you any real evaluation of that because I wasn't involved in the major, but apart from some input into some of the subsystems maybe on the budget which is like a small amount.

MS. MCLELLAN: And you did handle the

subcontractor budget management though?

MR. WOOD: Yeah, there was system targets to try and keep to, yeah.

MS. MCLELLAN: And were those realistic, in your opinion?

MR. WOOD: Yeah, in terms of it was based on an hourly rate, so they seemed fairly reasonable about an average for that type of discipline.

MS. MCLELLAN: And in the time that you were working on the project, was there any work that was done to evaluate whether the budget was adequate?

MR. WOOD: I don't know. I wasn't involved in that part of the financial aspect.

MS. MCLELLAN: And were you aware of any work that was done to prepare for a need for the budget to be flexible or flexibility to be worked in?

MR. WOOD: No. Once again, no real input into that.

MS. MCLELLAN: And were you involved at all in value engineering?

MR. WOOD: No.

MS. MCLELLAN: So in terms of geo

technical risk, were you involved at all in the assessment of geo technical risk?

MR. WOOD: It's not my discipline. No, it's the geo phys guys.

MS. MCLELLAN: And milestone payments, I think you spoke to this, but were you involved in determining the milestones and what they would be, how much would be paid upon completion of each milestone?

MR. WOOD: No.

MS. MCLELLAN: Were you involved in assessing whether any changes should be made to the milestone payments once construction was underway?

MR. WOOD: No.

MS. MCLELLAN: And the role of Infrastructure Ontario, so was IO or Infrastructure Ontario working on the project when you started, or did they join after?

MR. WOOD: I think they were pretty close in when I did because a decision to move from design build to the AFP came pretty close to when I joined. So I remember meeting Allan and Bruce fairly early on.

MS. MCLELLAN: And what was their role?

MR. WOOD: They were just -- they were

just basically -- I didn't have a lot of interaction apart from some of the more technical aspects of the PSOS in terms of what there was. And in terms of molding it into a railway specific specification.

MS. MCLELLAN: So you did work a bit with Infrastructure Ontario?

MR. WOOD: Yes, I did a bit and Kitty Chan as well. I think Allan left and Kitty came on board.

MS. MCLELLAN: So what were your primary interactions with Infrastructure Ontario?

MR. WOOD: Nothing much apart from providing some early descriptive data that would go into the PSOS.

MS. MCLELLAN: And how did their involvement impact the project?

MR. WOOD: They were steering the project. I didn't have a lot of interaction with them. I think they were more at the project agreement level and their lawyers, et cetera, steering that aspect of it, and we were left to the technical aspects.

MS. MCLELLAN: Then I think you did speak to your involvement in implementation a bit,

but are you able to speak to the City's approach to monitoring progress in compliance with the project agreement through the implementation phase?

MR. WOOD: Through the implementation phase, as in you mean the construction phase or the integration phase?

MS. MCLELLAN: Well, specifically yeah, the construction phase, testing commissioning, were you involved in either of those?

MR. WOOD: I was not involved in testing commissioning or the construction phase.

MS. MCLELLAN: You weren't involved at all with design reviews in the construction phase?

MR. WOOD: No, there was no design reviews in the construction phase. The design phase finished and goes into construction stage ideally.

MS. MCLELLAN: In your opinion, did the City have the resources and expertise to evaluate compliance with the project agreement In implementation phase?

MR. WOOD: In the implementation phase or the design phase?

MS. MCLELLAN: In the implementation phase.

MR. WOOD: I wouldn't know on the implementation. I don't know what you mean by implementation phase. Do you mean on construction and testing integration?

MS. MCLELLAN: Yes.

MR. WOOD: As I said, I wasn't part of the testing integration phase so I couldn't tell you how many people were employed on that and whether they had the requisite experience.

MS. MCLELLAN: I believe we spoke to the independent assessment team that was hired in 2017. But just to be clear, did you interact with the independent assessment team?

MR. WOOD: I don't believe -- I can't think of any reason -- referred to me as that, so I think I provided metrics to Richard on the safety -- because that would be my role at that time on the safety liaison documentation. I think that was about all I did in terms of reporting. And I think they aggregated that data and provided an overall assessment to committee.

MS. MCLELLAN: And what did you understand the role of the independent assessment team to be at the time?

MR. WOOD: I don't know. As I said, I

didn't interact with them very much. I presume they were high level reporting GT in terms of understanding what was happening on the project. I don't know who the individuals are or how qualified they would be for that.

MS. MCLELLAN: Are you aware of any preparations that were done -- any preparation that was done for operation and maintenance post revenue service?

MR. WOOD: Not post revenue service. All I can say is that although the standards and procedures were identified, they were obviously written because the independent safety auditor would have looked at those as credible evidence. Now, whether they were implemented and they were -- people were trained on them, I don't know.

MS. MCLELLAN: And in terms of trial running and handover, you were not involved in that?

MR. WOOD: I was not involved in that, no.

MS. MCLELLAN: Were you aware of the proposal of a soft start?

MR. WOOD: Soft start, I don't know what that means.

MS. MCLELLAN: A soft start sort of before, you know, running full service, a sort of test period.

MR. WOOD: Okay. I think I know what you mean. It's the maturity for liability. I wasn't made aware of that. I don't think I would have been made aware of that because of what I was doing with TUV. It would seem a reasonable approach.

MS. MCLELLAN: It would seem a reasonable approach?

MR. WOOD: As a soft start, possibly, yes.

MS. MCLELLAN: But you weren't aware at the time that that was being proposed?

MR. WOOD: I don't believe I had any impact on what I was doing at the time. It would just be a gentle burn in of the system.

MS. MCLELLAN: In terms of other light rail projects that you've worked on, have there been soft starts in the past that you've experienced working on?

MR. WOOD: There's always -- yeah, a lot of the projects have a reliability growth phase. The reliability guys talk about bathtub

curve, and the secret is really to get that curve initial slope to be as quick as possible but that depends on, you know, the types of equipment, et cetera, and how that's monitored in the growth phase.

MS. MCLELLAN: Before I ask my final two questions, Ms. McGrann, do you have any questions?

MS. MCGRANN: Just one or two. I will be hopping around in the chronology, so I'll do my best to flag where I'm referring to. But with respect to the procurement phase, I understand that there was a prequalification of the vehicle providers that each of the proponents was proposing; are you familiar with what I'm talking about?

MR. WOOD: Yes, I am. Yes.

MS. MCGRANN: Are you able to speak to at all the examination of vehicle provider that RTG proposed, CAF?

MR. WOOD: Yeah, they're a Spanish company. CAF were the chosen vehicle manufacturer for Edinburgh, the project I worked on before.

MS. MCGRANN: Can you explain what happened with the prequalification evaluation of

CAF?

MR. WOOD: CAF didn't score so well because they had that cold weather experience for the vehicle. They couldn't demonstrate it, and one of the criteria was to have a revenue service vehicle that's actually running in a cold climate, which is the -- Ottawa is a very tough climate to work in. It's a very onerous, environmental condition, which is unlike many capitals around the world, so it's a really tall order.

MS. MCGRANN: And was it your understanding that also was Alstom was able to demonstrate the cold weather performance the City was looking for?

MR. WOOD: It was close to providing. They had some early work in Moscow, which is similar. It also had some Nordic commuter rail experience as well, which is obviously very useful as well. So Alstom is a very well respected vehicle manufacturer. It would be the equivalent of Ford, if you like, for car vehicles. So it's probably the best choice for this environment.

If you compare OTP who chose Bombardier, well, we would have had the Bombardier issues that we had in Toronto.

MS. MCGRANN: The other question I have is you referenced a pain share gain share arrangement and I was wondering if you could just explain what you were referring to?

MR. WOOD: It's in Schedule 20. There are some reliability figures in there in which the overall system has to achieve. If it doesn't achieve those, then there are penalties for the proponent in terms of performance, not meeting performance. I think vehicle availability is one of those. So they have to meet so much up time versus downtime and it just stimulates this time and it feeds into the characteristics of the reliability calculations for the system.

MS. MCGRANN: And just for the sake of the transcript, you referred to payback, is that a payment mechanism?

MR. WOOD: Yes.

MS. MCGRANN: Those are my follow-up questions. Thanks very much.

MS. MCLELLAN: So in terms of the interview today, are there any issues that we didn't discuss or any other issues that you believe are relevant to the Commission's mandate that should have been covered?

MR. WOOD: No, I think you've covered a fairly good expansive subject there.

MS. MCLELLAN: So as part of the Commission's mandate to receive and provide recommendations on scope of the project, do you have any specific recommendations that you have?

MR. WOOD: Yes, I would -- there are three things that I would recommend.

So you've touched on them. I think you already get a sense of that is that the system assurance side needs to be much stronger on a complex project like this. Systems engineering is a de facto standard around the world, and most projects that use it are successful coming on budget and on time at least.

My other recommendation would be, and this would be for the regulator, is for professional engineers of Ontario, I would suggest that they extend the certificate of authorization to consortia so there is, in fact, a point of contact for responsibility. That's important.

MS. MCLELLAN: Do you have a reason why in terms of your second recommendation and extending certificate authorization because that --

MR. WOOD: The certificate of

authorization, that nominates a professional engineer as being responsible for a project. When you've got consortia, you have a number of different professional engineers all nominated, and I think it saves confusion, and I think it would just tidy up the whole certificate of authorization process.

MS. MCLELLAN: Was that an issue that you ran into on the project then?

MR. WOOD: I can't say on other projects, but I think it would be a recommendation from what I'm seeing, yeah.

MS. MCLELLAN: Okay. Ms. McGrann, subject to any further questions you have --

MR. WOOD: I do have one final thing to propose.

MS. MCLELLAN: Sorry.

MR. WOOD: That's okay. The third item is that the safety assurance process needs to be decoupled from the commercial and technical processes. And that's pretty normal on most railway systems as well, and that's because the safety decisions need to be decoupled from financial decisions.

MS. MCGRANN: Can you explain in a

little bit more detail what you mean by that?

MR. WOOD: Sure. So if a safety officer has a particular concern and a technical director would like to override them, they should have that position. It's mandated in 50126 that they're decoupled, and that gives you some independence of decision-making.

MS. MCGRANN: Did you see any instances of a technical director overriding concerns raised by a safety officer on this project?

MR. WOOD: No, not in this case, but in the true sense of 50126, it talks about keeping the commercial aspects away from the safety decision. It makes sense.

MS. MCGRANN: Okay. No further questions from my end. We promised your counsel that they would have the opportunity to ask follow-up questions, and we certainly have time. Any questions from you?

MS. GARDNER: Thanks, Ms. McGrann, I don't have any questions at this time. Thank you.

MS. MCGRANN: I think that brings our questions to and end then. So thank you very much for your time this evening where you are.

-- Whereupon the examination concluded at 4:00 p.m.

REPORTER'S CERTIFICATE

I, COLLEEN REA, CSR, Certified Shorthand Reporter, certify;

That the foregoing proceedings were taken before me at the time and place therein set forth, at which time the witness was put under oath by me;

That the testimony of the witness and all objections made at the time of the examination were recorded stenographically by me and were thereafter transcribed;

That the foregoing is a true and correct transcript of my shorthand notes so taken.

Dated this 3rd day of May, 2022.

NEESON COURT REPORTING INC.

PER: COLLEEN REA, CSR

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