

## **Part II Findings**

### **Chapter 4 Early Construction Stage (January 2010 to April 2013)**

4.1 In this Chapter, reference to "Early Construction Stage" covers the incidents that took place at different sites of the Project between late January 2010 and April 2013, the corresponding actions taken by the stakeholders and the issues that arose as a result. This Chapter outlines the key dates for the Early Construction Stage and the chronology of developments mainly based on the 1<sup>st</sup> IBC Report. It also sets out the Select Committee's observations on whether the Entrustment Programme in EA2 is tight, the project management issues and the corporate governance of the Corporation. During the course of its inquiry, the Select Committee has used its best endeavours to discover the reasons for the project delay and to draw conclusions based on the available evidence and information.

#### **Key dates for the "Early Construction Stage"**

<b>Date</b>	<b>Events</b>
Late January 2010	Construction of the Project commenced.
1 February 2010	Mr CHEW Tai-chong was appointed as Projects Director of the Corporation.
28 May 2010	The Corporation advised the Government that the Mainland section of the cross-boundary tunnel would suffer a delay of six months.
12 July 2010	Contract 823A at the location of the former Choi Yuen Tsuen was awarded.
16 August 2010	HyD employed Jacobs as the M&V consultant to monitor and verify cost, programme, safety and quality aspects of the Project. Contract

commenced in August 2010 and was scheduled to end in January 2016.

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| September 2010 | Mr Peter LAU Ka-keung was appointed Director of Highways.  |
| May 2011       | Land resumption in Choi Yuen Tsuen was completed.  |
| End May 2012   | Mr Joseph LAI Yee-tak was appointed Permanent Secretary for Transport and Housing (Transport).   |
| 1 July 2012    | Professor Anthony CHEUNG Bing-leung was appointed Secretary for Transport and Housing.   |
| 18 July 2012   | Mr Jay H WALDER, the then CEO of the Corporation, wrote to Professor Anthony CHEUNG Bing-leung stating that the Corporation maintained their target of completing all works to enable the successful opening of HKS of XRL in 2015 as planned.                       |
| 17 April 2013  | Contractor of contract 810A proposed to revise the completion date of WKT to June 2016, but was rejected by Projects Director. Contractor of contract 810A was asked to work on a Partial Opening Plan, with the aim of achieving the opening of HKS of XRL in 2015. |

## **Chronology of developments**

4.2 The Select Committee had difficulties in obtaining certain important minutes of meetings/documents which were considered to be pertinent to the reason for the project delay. For this reason, the Select Committee had to rely on certain findings of fact in the 1<sup>st</sup> IBC Report to fill in gaps in the period from January 2010 to April 2013 during the construction phase of HKS of XRL. The construction phase of the Project began in late January 2010. At the second Project Supervision Committee meeting held on 28 April 2010, it was reported that the tunnel

and E&M detailed design were on schedule, the piling and the diaphragm wall works at WKT were gaining momentum and there was only a minor delay in the civil works design and in the preparation of tender documents. The progress report presented at the April 2010 Board meeting indicated that HKS of XRL would be ready for service in 2015.<sup>32</sup>

#### First signs of delay

4.3 At the third Project Supervision Committee meeting on 28 May 2010, the Corporation reported to the Government a possible project delay, advising that the Mainland section of the cross-boundary tunnel would likely incur a delay of approximately six months; however, mitigation measures were discussed with Shenzhen authorities in order to ensure the commissioning of the Mainland section by mid-2015. In June 2010, the Government reported to Railways Subcommittee that the progress of the tunnel works in the Project was generally satisfactory with no major difficulty, the foundation works of WKT were progressing on schedule and the detailed design of the terminus building was being finalized.<sup>33</sup>

4.4 Since early days of the Project, however, specific work streams started to experience delay – namely, the cross-boundary tunnel works, the removal and re-provisioning of the Nam Cheong Property Foundation under contract 802 and the West Kowloon Terminus Approach Tunnels as well as some issues with the WKT itself. These delays were reported to the Government and the Corporation undertook certain mitigation measures.<sup>34</sup>

#### Impact of late land possession on contract 823A

4.5 At an early stage, the late possession of land in Yuen Long caused delay to contract 823A – railway tunnels from Tai Kong Po to Tse Uk Tsuen. The Select Committee notes from the Corporation's report

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<sup>32</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.14.

<sup>33</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.15.

<sup>34</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.16.

submitted to Railways Subcommittee in May 2014<sup>35</sup> that "*[contract 823A] is at the location of the former Choi Yuen Tsuen. Site access was delayed at the beginning of the project due to land resumption problems. Landowners and other interested parties strongly objected to the land being resumed and as a result, the land resumption process took significantly longer than originally anticipated resulting in a delay from November 2010 to May 2011. This also restricted the amount and extent of the site investigation works that could be carried out prior to this contract being tendered*". It is understood from the 2<sup>nd</sup> half-yearly report to Railways Subcommittee that contract 823A was awarded on 12 July 2010 whereas the land resumption in Choi Yuen Tsuen was completed in May 2011.

4.6 According to the evidence of Mr Lincoln LEONG Kwok-kuen, contract 823A was delayed by the late possession of land at Choi Yuen Tsuen, higher than anticipated rock head levels, tunnel boring machine breakdown and frequent repair and inability to achieve the planned production rates.

4.7 While the original contract scope was to use only one tunnel boring machine, it became necessary to deploy a second tunnel boring machine to mitigate the delay and the Corporation instructed the contractor to procure the machine accordingly.<sup>36</sup>

#### All tunnel projects affected by delay events

4.8 The Select Committee notes that<sup>37</sup> in fact all eight of the major tunnel contracts for the Project, namely contract 820 – Mei Lai Road to Hoi Ting Road Tunnels; contract 821 – Mei Lai Road to Shek Yam Tunnels; contract 822 – Shek Yam to Pat Heung Tunnels; contract 823A – Tse Uk Tsuen to Tai Kong Po Tunnels; contract 823B – Shek Kong Stabling Sidings and Emergency Rescue Sidings; contract 824 – Tai Kong Po to Ngau Tam Mei Tunnels and contract 825 – Ngau Tam Mei to Mai Po Tunnels and contract 826 – Huanggang to Mai Po Tunnels

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<sup>35</sup> Paper submitted by the MTR Corporation Limited to the Subcommittee on Matters Relating to Railways, LC Paper No. CB(1)1354/13-14(01), paragraph 36.

<sup>36</sup> Paper submitted by the MTR Corporation Limited to the Subcommittee on Matters Relating to Railways, LC Paper No. CB(1)1354/13-14(01), paragraph 38.

<sup>37</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.108.

had been affected by a number of delay events some of which had been critical to the Project programme path.

4.9 Problems with the major tunnel contracts include:

- (a) all eight tunnel contracts had been affected by unforeseen ground conditions, such as higher than anticipated rock head levels, high water inflows, presence of cobbles and boulders and presence of underground steel obstructions and so on. The delay to each contract as a result of unforeseen ground conditions varied up to 12 months;
- (b) the late arrival of both tunnel boring machines from the Mainland substantially delayed the commencement of the Hong Kong section of contract 826 by up to 15 months, thus making contract 826 one of the three most critical contracts affecting the completion of the Project on time;
- (c) contract 823A had been delayed by the late possession of land at Choi Yuen Tsuen, unforeseen ground conditions, breakdown and frequent repairs of both tunnel boring machines and inability to achieve the planned production rates; and
- (d) with the exception of contracts 820 and 821, all tunnel contracts had been unable to achieve the overall planned production rates which was one of the major causes of delay to the Project.

Problems at WKT

4.10 The Select Committee also notes that the four civil construction work contracts for WKT, namely: contract 811A – West Kowloon Terminus Approach Tunnel (North); contract 811B – West Kowloon Terminus Approach Tunnels (South); contract 810A – West Kowloon Terminus Station (North) and contract 810B – West Kowloon Terminus Station (South), had all been affected by delay in a number of events some of which had been critical to the Project programme path.<sup>38</sup>

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<sup>38</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.106.

4.11 Such events include:

- (a) the two advanced work foundation contracts 803A and 803D in the 810A station (north) and 810B station (south) areas encountered unforeseen ground conditions prolonging the construction of the external station box diaphragm wall. This affected the contract award dates for the two main station contracts 810A and 810B;
- (b) in the 810B station (south) area a number of design changes were incorporated to align with the latest design of West Kowloon Cultural District. Despite the site investigation that had been carried out, the unforeseen ground conditions together with the late utility diversions also affected the progress of the works. These delays caused knock-on delay to the work of the critical 810A station (north) area, in particular, the centre core station structure and the roof, to an order of 11 months;
- (c) in the 811A and 811B approach tunnel areas and in particular 811B, significant delays due to the late utility diversions, deployment of measures to overcome the complex utility arrangements and more unforeseen ground conditions had prolonged the construction of the diaphragm wall in the three key areas (to the north of Jordan Road and then within the area bounded by Jordan Road after the road had been diverted) that were required to be constructed sequentially. These delays had knock on effect on the work of the 810A station (north) top-down area directly affecting one of the Project's critical paths to an order of 15 months; and
- (d) 810A was further delayed by the issues relating to the quality of the steel couplers<sup>39</sup>, the unexpected movement of the west diaphragm wall, the unforeseen ground conditions, the design changes, the issues related to the quality of roof steelwork fabrication and the

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<sup>39</sup> Couplers are used to couple two steel reinforcement sections before pouring concrete into the structure.

interdependencies between the temporary and permanent structural designs. The latter three issues caused significant delay to the roof construction.<sup>40</sup>

The then CEO wrote to Professor Anthony CHEUNG Bing-leung on 18 July 2012

4.12 Despite the difficulties set out above, on 18 July 2012, the then CEO of the Corporation wrote to Professor Anthony CHEUNG Bing-leung to the effect that the Corporation maintained its target of completing all works to enable the successful opening of HKS of XRL in 2015 as planned, despite certain challenges including those on completion of the connecting tunnels with the Shenzhen side, which was six months behind schedule as of 18 July 2012.

4.13 By the end of 2012, WKT was experiencing considerable delay to its civil works, and there were also delays in the tunnelling works of the Mainland section.<sup>41</sup> At the Project Supervision Committee meeting on 25 January 2013, the Corporation confirmed that as at the end of December 2012, the actual progress of the Project was 31.4% complete against the planned progress of 46.1% under the original programme. Mr Peter LAU Ka-keung enquired when the Corporation could advise on the overall Project master programme as well as the DRMs planned for WKT. The Corporation responded that it was working on a presentation for the matter. The Corporation advised the Government that the slippage in the programme for excavating the WKT site could be made up for by mid-2013 and that the Corporation was further exploring measures to compress the works of contract 826 (the cross-boundary tunnels) and expediting other activities so as to absorb the delay and to ensure completion in 2015.<sup>42</sup>

4.14 The Select Committee notes from the 1<sup>st</sup> IBC Report that from 2010 to 2012, there was no change made to the planned opening date in

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<sup>40</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.106.

<sup>41</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.18.

<sup>42</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.19.

August 2015.<sup>43</sup> The Select Committee finds this extraordinary in light of the fact that the construction works in different areas under different contracts were going through very rough patches during this period.

Projects Director told the Board in March 2013 that things were fine

4.15 During his presentation on the progress on all the Corporation's projects at the Audit Committee Meeting on 5 February 2013, Mr CHEW Tai-chong noted that there were "critical" delays with the WKT construction and significant delays with the tunnelling works. However, he confirmed that good progress was still being made despite the challenges and discussed at the meeting the DRM initiatives. Subsequently, at the Board meeting on 7 March 2013, Mr CHEW Tai-chong confirmed to the Board that all projects were on target from a cost and time perspective.<sup>44</sup>

4.16 A similar commitment to the August 2015 goal was expressed in the Project Supervision Committee meeting on 22 March 2013, when the Corporation stated that, despite the slow progress of the tunnelling works in the Mainland section, most of the works would be completed by August 2015 for testing and commissioning. By the time of this Project Supervision Committee meeting, the Corporation was reporting that the actual progress of the Project was 34.3% complete as against the 51.9% planned under the original programme.<sup>45</sup>

Projects Director was urged to revise completion date

4.17 In an e-mail dated 27 March 2013 to Mr CHEW Tai-chong, the Chief Programming Engineer of the Corporation urged that the completion date for the whole of the works should be revised to the end of September 2015 with a revised opening date in December 2015 for HKS of XRL. At the Board meeting on 15 April 2013, while slippages were acknowledged, there was no suggestion that HKS of XRL would not

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<sup>43</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.16.

<sup>44</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraphs 4.20 and 4.21.

<sup>45</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.22.



open in 2015.<sup>46</sup>

4.18 On 27 March 2013, Jacobs attended a Project Master Programme ("PMP") Audit meeting with the Corporation at which an updated copy of the PMP was tabled. But Jacobs was not given a copy of the updated PMP. (**Appendix 22**)

Contractor requested to revise completion date to June 2016

4.19 On 17 April 2013, a workshop was held by the Project Team of the Corporation with the contractor for contract 810A in WKT to analyze progress and measures to recover delay. At that meeting, the contractor put forward a revised construction completion date of June 2016 for the entire work. This revised completion date in 2016 was rejected, however, by Mr CHEW Tai-chong, and the contractor was asked to work with the Project site team to identify solutions for achieving the original target opening of HKS of XRL in 2015.<sup>47</sup>

4.20 Whilst the Project Team had first begun to consider a partial opening plan in March 2013 due to the delays already experienced with the WKT contracts, it was after this meeting with the contractor of contract 810A that a plan for a partial opening scenario was worked on in earnest ("Partial Opening Plan"). This Partial Opening Plan, which the Project Team worked on throughout April to June 2013, was being made on the assumption that only six long-haul tracks would be operational at the time of the opening (as opposed to the originally proposed 10 tracks) with the tunnels fully operational. It was formulated and proposed as a solution for achieving the opening of HKS of XRL in 2015 on a reduced operational scope.<sup>48</sup>

4.21 Under the Partial Opening Plan, some external works (e.g. footbridges and subways) and the WKT roof structure would not be completed by the end of 2015. It was thought that this would not affect the operation of passenger services. The knowledge of the existence of

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<sup>46</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.23.

<sup>47</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.26.

<sup>48</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.27.

the Partial Opening Plan was largely confined to the Project Team until it was revealed to ExCom in a presentation in July 2013.<sup>49</sup>

4.22 The Select Committee sent a letter to the Corporation at an early stage of the inquiry in January 2015, requesting a copy of the minutes of the workshop held on 17 April 2013 between the Corporation and the contractor of contract 810A. The Corporation responded that no formal minutes of the 17 April 2013 workshop had been taken by the Corporation.

4.23 At the Board meeting on 25 April 2013, Mr CHEW Tai-chong reported that, despite some slippages in the programme (including delays in the WKT excavation work), all works remained generally on target and, from a budget perspective, contingency balances were generally appropriate.<sup>50</sup>

Director of Highways asked to be informed of any delay

4.24 At the Project Supervision Committee meeting on 26 April 2013, the Chairman of Project Supervision Committee, i.e. Mr Peter LAU Ka-keung, indicated that, if there was delay to the opening of HKS of XRL, HyD should be informed as soon as possible. The Corporation advised that a presentation of a revised programme for WKT would be given to HyD in July 2013. At that meeting, Mr Peter LAU Ka-keung also requested that due consideration should be given to the potential prolongation cost and the acceleration cost and that either approach would have to be substantiated and justified.<sup>51</sup>

4.25 On 30 April 2013, the Corporation reported to Project Supervision Committee that the actual percentage completion as against the planned progress of the Project was 37.56% and 53.87%, respectively.<sup>52</sup>

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<sup>49</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraphs 4.27 and 4.28.

<sup>50</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.29.

<sup>51</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.30.

<sup>52</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.31.

4.26 THB submitted a total of five half-yearly reports to Railways Subcommittee, covering the period from 16 January 2010 to 30 June 2012, with the 5<sup>th</sup> report submitted in October 2012. In these reports, the Corporation was said to have maintained throughout the period a target completion of the Project in 2015. However, the actual and planned progress of the Project was not presented in any of these five reports.

## Observations

### Whether the Entrustment Programme is too tight

#### *Timetable*

4.27 The Select Committee has focused on the issue of whether the Entrustment Programme in EA2 to complete the Project was tight. The Select Committee notes the comments of IEP and IBC and sought the views of the witnesses from the Government and the Corporation; and deliberated on whether a "too-tight" programme was a reason for the project delay.

4.28 The Select Committee notes from the IEP Report that "*[a]s to the provision in EA2 that the XRL Project would be completed and handed to Government by 4 August 2015, [the Corporation] set this planned completion date and sought assurance from third party consultants regarding the achievability of the timeline. [The Corporation] was advised that the schedule was extremely tight but achievable and was dependent on unusually high production rates for certain key activities, notably the Terminus. In addition, [the Corporation] had been made aware of potential shortages of skilled labour resources.*"<sup>53</sup>

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<sup>53</sup> Report of HKS of XRL Independent Expert Panel, paragraph 3.13.

4.29 On 3 November 2015, Mr Lincoln LEONG Kwok-kuen informed the Select Committee that *"with regard to the timetable, as members are aware and well highlighted in the IEP Report, there were a number of third parties that reviewed and looked at the timetable and the programme-to-complete together with [the Corporation]. And, all along, the views that we have from the third parties are that the timetable is doable but tight"*.

4.30 Mr Peter LAU Ka-keung also informed the Select Committee at the hearing on 21 April 2015 that the Entrustment Programme was indeed a tight one and the Government had asked the M&V consultant to check the feasibility of the timetable, which had been found feasible by the Corporation back in 2007. The M&V consultant found that the timetable would be a tight one with little contingency. But the consultant did not advise that it was impossible.

4.31 When asked at a hearing whether there were contingency periods allowed for the contracts under EA2 and whether they were sufficient, Dr Philco WONG Nai-keung, the Projects Director, and Mr Mark LOMAS, Project Manager–Technical Support, of the Corporation confirmed that, although there were contingency periods allowed for critical contracts, those contingency periods were not sufficient to cater for the delays caused by the unexpected ground conditions.

4.32 Mr WAI Chi-sing, former Director of Highways, also informed the Select Committee at the hearing on 2 June 2015 that when the Government set the completion date, the Entrustment Programme was found to be reasonable with 4 August 2015 set as the target completion date. Referring to the comments made by his colleagues in HyD, Mr WAI said that the contractors had also assessed the schedule and had found that the work could be completed within the time frame and budget.

4.33 The Select Committee also notes from the evidence of Mr WAI Chi-sing at the above hearing that no tenderer had raised during the tender process that the deadline in individual contracts was not achievable, and that after all major contracts had been awarded, there was still a considerable amount of time for contingency left for the Project. The

Select Committee was not, however, provided with any of the contracts signed between the Corporation and its contractors despite request.<sup>54</sup>

*No change of completion date if commencement date of a contract deferred*

4.34 Mr WAI Chi-sing commented that when the Government considered the Entrustment Programme, there were a total of over 40 contracts in the Project and that each contract would have a start date and a completion date. When one were to realistically analyze the situation, one had to consider that, if the start date of a contract was deferred, its completion date should also be correspondingly deferred. If in any contract the start date was postponed but the completion date was not, then the contingency allowed would be reduced. The 1<sup>st</sup> IBC Report<sup>55</sup> said that "[f]rom 2010 to 2012, there was no change made to the planned opening date of August 2015".

4.35 The Select Committee further notes from the evidence of Mr Henry CHAN Chi-yan at the hearing on 20 October 2015 that contract 811B had been delayed by the problems with the construction of the diaphragm wall and had in turn affected the commencement of contract 810A. Mr Henry CHAN Chi-yan also informed the Select Committee that they understood that the commencement date of contract 810A had

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<sup>54</sup> In response to the Select Committee's request for extract of the work contracts signed between the Corporation and main contractors in respect of the WKT and a number of tunnels for the Project, the Corporation informed the Select Committee in February 2015 that owing to concerns on confidentiality or commercial sensitivity, the documents would be provided to the Select Committee if the Select Committee agrees that such documents would not be disclosed to the public and be kept under strict control in a designated location and not to be removed from that location or photocopied. The Corporation further stated that the consent of the Select Committee to this arrangement would be required before the relevant information or documents could be disclosed and that extracts from the relevant work contracts would be provided if the Select Committee agrees to keep the documents and their contents confidential and to use the documents at closed hearings only. The Select Committee considers it inappropriate to enter into an agreement with the Corporation as condition precedent for the provision of documents to it and finds the proposed arrangements unacceptable and rejects them.

<sup>55</sup> First Report by the Independent Board Committee on the Express Rail Link Project, paragraph 4.16.

been deferred but its completion date had not been postponed. It was Mr CHAN's belief that the Project Team of the Corporation had taken the view that the Project could still be completed by August 2015 without having to extend the work schedule and with the use of DRMs.

4.36 Mr TAM Hon-choi, Government Engineer/Railway Development 2 of HyD, also informed the Select Committee that *"it was normal for the industry to move some of the items in a contract to the other contract so as to retain the completion date of the contract due to the late commencement of the contract. We noticed that the Corporation had put in a lot of efforts and taken out some works items from a contract to the other contract. It was also observed that during the tender process, no tenderer for the other contract had raised that it was not achievable even if the completion date was not postponed."*

4.37 The Select Committee notes the view of Mr Anthony J W KING of Jacobs at the hearing on 10 November 2015 that *"...we reported consistently that the project was in delay due to the various component delays of the various contracts. And if the delays continued and were not recovered, there was going to be a risk to the end date of the Project"*.

4.38 The Select Committee considers that, as all the planned work items under the Project had to be completed by the original completion date of August 2015, the postponement of the commencement dates of some contracts along the line would inevitably have impact on the overall completion date of the Project. The Select Committee sees no evidence to show that the DRMs, in general, had the effect of reducing the overall delay, which was accumulating. The act of the Corporation to rearrange the work items from one contract to another contract was postponing the problem, not reducing it, let alone eliminating it. Other project management issues will be further discussed in the ensuing Chapters.

#### *Over-optimism on the part of the Corporation*

4.39 The Select Committee notes IEP's comment<sup>56</sup> that *"[a]lthough [the Corporation] generally acknowledged the risks identified by its consultants, no [Schedule Risks Assessments] or sensitivity studies were carried out at the time of establishing EA2 or the initial baseline to*

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<sup>56</sup> Report of HKS of XRL Independent Expert Panel, paragraph 3.14.

*estimate the probability that the Project could be completed by the specified date". It is noted that IEP believed that such analysis would have shown that the 2015 opening date of HKS of XRL was overly optimistic.*

4.40 The Select Committee also observes that<sup>57</sup> the Project had an increased risk profile compared to the previous railway projects, because HKS of XRL was of a different project type (High-speed Rail), required integration with Mainland rail (cross-boundary issues) and followed a new organizational setup (concession approach). Each of these factors was a "first" for the Corporation, thereby increasing the uncertainties and, therefore, the risk profile of the Project.

4.41 The Select Committee further notes that the 2<sup>nd</sup> IBC Report<sup>58</sup> commented that *"[i]nternational experience shows that [high-speed rail] projects are notoriously difficult to build to schedule and cost. It is not unusual for projects of this size and complexity to be subject to delays and cost increases. Building this type of project underground, including a main terminal, in one of the most densely populated urban areas in the world – as is the case for XRL – exacerbates the difficulties".*

4.42 Based on the above findings, the Select Committee considers that the Corporation and the Project Team were over-optimistic in accepting the project completion date. The Select Committee considers that, if the risk of cost overrun in the Project was borne by the Corporation instead of by the Government (EA2, Clauses 2.3 and 8.1), the Corporation might have been more cautious in agreeing to work with such a tight time schedule given the uncertainties inherent in the Project.

4.43 Mr Lincoln LEONG Kwok-kuen admitted at the hearing on 3 November 2015 that *"[e]ventually, continuing delays in several critical contracts meant that the original project completion date could not be achieved. Although the challenges and delays on individual contracts were well communicated to Government, over-optimism led to a belief that the original overall project completion date could still be met."*

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<sup>57</sup> Second Report by the Independent Board Committee on the Express Rail Link Project, Appendix paragraph 1.2.

<sup>58</sup> Second Report by the Independent Board Committee on the Express Rail Link Project, Appendix paragraph 1.1.

*Target completion date of 4 August 2015*

4.44 It appears to the Select Committee that the Government and the Corporation have different interpretations of the completion date of the Project. The Select Committee is of the view that when an agreement for work is signed (in this case EA2), there must be a target completion date of the work programme, otherwise there would not be any discussion about delay. The Select Committee also notes that in Appendix C (Entrustment Programme) to EA2, there is a reference to "Estimated Handover Date: 4 August 15".

4.45 The Select Committee notes from the statement of Mr WAI Chi-sing that *"[a]ccording to the EA2, the [Corporation] shall use its best endeavours to complete the Entrustment Activities in accordance with the Entrustment Programme subject to adjustment under justifiable situation. The [Corporation] shall consult and liaise with the Government in a timely manner if any adjustment would have the effect of amending the Entrustment Programme. The Entrustment Programme indicates that the XRL project would complete testing and trial running, and be ready for operation by 4 August 2015"*. The statement of Mr YAU Shing-mu, Under Secretary for Transport and Housing, also stated that *"[t]he Entrustment Programme indicates that the XRL project would complete testing and trial running, and be ready for operation in August 2015."*

4.46 However Mr Lincoln LEONG Kwok-kuen said in his statement that *"[EA2] does not impose an absolute obligation [on the Corporation] to complete the project by 4 August 2015 considering that, with a project as challenging and complex as the XRL, there is always a risk of delays. Rather, under [EA2], the Corporation is to use its best endeavours to complete, or procure the completion of, the project in accordance with the Entrustment Programme and to minimise the effect of any delay. The Entrustment Programme is subject to modification as a result of change, including as a matter of right due to contractor delays that result in extensions of time for the contractors to deliver their obligations."*

4.47 At the hearing on 21 December 2015, Professor Anthony CHEUNG Bing-leung, in reply to the questions raised by the Select Committee, expressed that the date of 4 August 2015 was meaningful and should be regarded as a completion date in the implementation of the Project. Professor CHEUNG also informed the Select Committee that,



although it was difficult to take the date as an absolute date subject to no change, the Corporation should use its best endeavours to procure the completion of the Project because, before signing EA2, the contracting parties should have made their own assessment and found the completion date acceptable.

4.48 The Select Committee considers that the Government, or indeed the Government led by Sir Donald TSANG Yam-kuen, the former Chief Executive, chose at the planning stage to rely on the Corporation to deliver the Project by adopting the "check the checker" formula and the fast-track front end approach. The Select Committee considers that, if the "check the checker" system was not working well, or not seen to be working well, and the Entrustment Programme was set too tight and ultimately led to delay in the Project, the delay might be inevitable. As such, it might be unfair to put all the blame on the incumbent officials in THB or HyD.<sup>59, 60, 61</sup>

#### Insufficient contingency to absorb unforeseen conditions or events

4.49 At the hearing held on 2 June 2015, Mr WAI Chi-sing quoted the view of the Independent Experts appointed by the Corporation that *"the negative impact of unforeseen events on the schedule was not so much caused by any flaw in engineering or project management as by a lack of an adequate schedule contingency for critical contracts. A longer schedule contingency would have allowed the Project Team to absorb unforeseen events as they occurred"*.

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<sup>59</sup> Members voted on Mr WU Chi-wai's proposal to delete paragraph 4.48. The proposal was defeated (please refer to paragraph 44 of the Minutes of Proceedings of the meeting held on 7 June 2016 in this Report).

<sup>60</sup> Members voted on Mr TANG Ka-piu's proposal to delete "因此，把所有責任歸咎於運輸及房屋局或路政署的現任官員，指他們沒有做好監察該工程項目的工作，或會有欠公允。". The proposal was defeated (please refer to paragraphs 45 and 46 of the Minutes of Proceedings of the meeting held on 7 June 2016 in this Report).

<sup>61</sup> Members voted on Mr Gary FAN Kwok-wai's proposal to amend paragraph 4.48. The proposal was defeated (please refer to paragraphs 47 and 48 of the Minutes of Proceedings of the meeting held on 7 June 2016 in this Report).

4.50 In this connection, the Select Committee notes<sup>62</sup> the observation of IBC that, when compared with the benchmark of international projects, HKS of XRL was planned with a shorter than usual front-end process for the project programme. The front-end process from ExCo policy support to signing project agreement included the gazettal of the scheme and the gazettal of amendments to the scheme. The time between these gazettals reflected the time needed by projects to address objections regarding their environmental and social impact. The Select Committee notes that<sup>63</sup> the other four railway projects currently under construction took on average 45 months from ExCo policy support to project agreement, whereas the international benchmark showed an average length of front-end process at 37 months. The Select Committee notes that the Project completed the front-end process in 22 months, which was substantially shorter than the average of the other four railway projects under construction in Hong Kong and the international benchmark.

4.51 However, the Select Committee finds no evidence to show that the relatively short front-end process for the Project had affected the site investigation.

4.52 As stated in paragraph 4.5 above, the protests at Choi Yuen Tsuen and the delayed site possession demonstrated that, due to fast tracking, the objections of the external stakeholders had not been fully addressed in time. Subsequently, the late site possession delayed the commencement of work by 225 days (contract 823A) and 130 days (contract 823B) respectively.<sup>64</sup>

4.53 The Select Committee also notes from the 2<sup>nd</sup> IBC Report that, at interviews, the Project Team acknowledged that, in hindsight, the Corporation should have re-negotiated the opening date instead of relying on schedule compression.<sup>65</sup>

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<sup>62</sup> Second Report by the Independent Board Committee on the Express Rail Link Project, Appendix paragraph 3.12.

<sup>63</sup> Second Report by the Independent Board Committee on the Express Rail Link Project, Appendix paragraph 3.13.

<sup>64</sup> Second Report by the Independent Board Committee on the Express Rail Link Project, Appendix paragraph 3.13.

<sup>65</sup> Second Report by the Independent Board Committee on the Express Rail Link Project, Appendix paragraph 3.13.

### Queries surrounding the PMP

4.54 The Select Committee notes the criticism of IEP<sup>66</sup> that *"[t]he absence of reporting against a fully integrated, whole-project master programme has left Government in the dark"*.

4.55 In brief, IEP recommends<sup>67</sup> that, in accordance with best practice, the project manager should establish a project control and oversight function; develop and maintain an integrated master programme covering the whole scope of the project as a baseline for progress monitoring and reporting and carry out quantitative risk analysis to cover cost and schedule risks. IEP, in particular, recommends that *"the integrated master programme is to show, inter alia, all significant contracts, interfaces, handovers, contract completions, overall project completion and dates when the railway will enter passenger service. The critical path or paths to overall project completion are to be highlighted."*

4.56 Mr Peter LAU Ka-keung indicated in his statement to the Select Committee that HyD accepted this recommendation generally. HyD agreed that an integrated master programme could easily show the effect of delay of any activity under the individual contracts on the Project's critical paths. Mr Peter LAU Ka-keung also stated that, while an integrated master programme had its advantages, the same information could also be obtained by making reference to a contract-based master programme coupled with analysis of the relevant progress information.

4.57 Mr Peter LAU Ka-keung stated that, for project progress monitoring, the Corporation used P6 Primavera (a software for programming and progress monitoring) to prepare its work programmes and required the contractors to use the same software to develop their contract programmes for compatibility. The Corporation set up a master programme of the Project with key dates and managed the contracts to achieve those key dates.

4.58 Mr Henry CHAN Chi-yan informed the Select Committee at the hearing on 20 October 2015 that, to his knowledge, the Corporation had

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<sup>66</sup> Report of HKS of XRL Independent Expert Panel, paragraph 6.11.

<sup>67</sup> Report of HKS of XRL Independent Expert Panel, paragraphs 7.5 to 7.9.

not developed an integrated master programme, but they knew that the Corporation had a master plan showing the timetable of each individual contract. He informed the Select Committee that the most important thing was that the Corporation had developed a programme called "TRIP" (i.e. Track Related Installation Programme) for monitoring the progress of the tunnelling works, track-laying and E&M works, and that the Project Team of the Corporation was able to sequence the track-related activities to best achieve the target completion date of the Project. He said that they had understood that the Corporation had made use of TRIP to monitor the Project.

4.59 Mr William NG Siu-kee of Jacobs, the M&V consultant, informed the Select Committee at the hearing on 10 November 2015 that *"generally, we did not have too much difficulty in...getting information from the Corporation...But for some of the sensitive documents like the overall master programme, we might have difficulty obtaining that instantly first-hand information..."*.

4.60 Mr Anthony J W KING also informed the Select Committee at the same hearing that *"but as you see from earlier discussions, we did ask for a project master programme and we did not see that project master programme. It was not delivered to us. We saw it on the table at audits but it was not delivered to us."*

4.61 The Select Committee has asked Jacobs in writing the number of times it had requested both verbally and in writing, through HyD, the "overall Project Programme" from the Corporation up to mid-April 2014 and the feedback from, or follow-up actions taken by, HyD. In response, Jacobs replied (**Appendix 20**) that they had requested the Corporation to provide and update the PMP on at least 17 occasions from April 2011 to April 2014 through the Monthly Progress Reports to HyD; and had raised similar programme related issues through the Issue List which was updated regularly and sent to HyD. HyD then forwarded the Issue List to the Corporation and requested it to respond to the issues raised by Jacobs, including the provision of the updated PMP. HyD requested Jacobs to review the Corporation's responses and note for the future M&V if necessary.

4.62 The Select Committee notes that, according to HyD (**Appendix 21**), the Issue List was prepared by the M&V consultant on a monthly basis based on the findings and observations during the course of

its document reviews, site visits and audits in its M&V work. HyD and the M&V consultant reviewed the Corporation's response to the comments and followed up with the Corporation, through regular meetings and other means within the monitoring mechanism until HyD was satisfied with the Corporation's response. It is noted that, through this arrangement, the Government would communicate with the Corporation in a timely manner on major and prevailing concerns on the progress of work, technical matters, safety and quality issues and necessary follow up actions. Nevertheless, at the hearing of 20 October 2015, Mr Henry CHAN Chi-yan informed the Select Committee that in respect of the advice given by HyD, they had not kept any record in the Issue List of any advice that the Corporation did not take actions accordingly, and that HyD would review such arrangement.

4.63 Further, in response to the questions raised by the Select Committee on the "overall Project Programme" as mentioned in paragraph 4.61 above, Jacobs replied that *"[i]n August 2011, following a Request for Documents (RFD), Jacobs received a copy of the programme entitled 'MTRCL's Master Programme for XRL Project (July 2011)' from [the Corporation] via HyD. Jacobs carried out a review of that Programme. In its review, Jacobs raised concerns regarding 16 issues it believed were deficiencies in the Programme, including that it was not an integrated and coordinated programme but a collection of individual contract programmes for Civil and E&M works."* Jacobs also informed the Select Committee that it had requested copies of three PMP related programmes through the Request For Documents process in April 2013. However, the Corporation advised Jacobs that it was not appropriate to supply these copies as the overall programme had not been finalized. It appears to the Select Committee that Jacobs was only given in August 2011, following a Request for Documents, a copy of the programme entitled "MTRCL's Master Programme for XRL Project (July 2011)" via HyD, which was not *"an integrated and coordinated programme"* envisaged by Jacobs or referred to by IEP in its report.

4.64 In November 2015, the Select Committee has sought answers from the Corporation on whether the Corporation had in its possession or under its control an integrated master programme for the Project; if yes, whether the Corporation had provided the integrated master programme to the Government and/or Jacobs, and if so, when.

4.65 The Corporation replied to the Select Committee on 21 December 2015 (**Appendix 22**) stating that the Corporation had developed and maintained an integrated PMP during the construction phase of the Project, that the PMP was based on summarising the individual contractors' master programmes using P6 Primavera format planning software. The reply also pointed out that Jacobs carried out seven separate audits of the PMP relating to the process and technical compliance under EA2 up to 30 April 2014 (i.e. PMP audits) and that none of the PMP audits necessitated any follow-up action on the part of the Corporation.

4.66 The letter also confirmed that a copy of the PMP updated to 31 January 2011 was tabled at the first PMP Audit meeting with Jacobs on 23 February 2011. Updated copies of the PMP were tabled at subsequent PMP Audit meetings with Jacobs on 1 December 2011, 24 August 2012, 27 March 2013 and 25 September 2013 respectively. It also said that, in response to the request made by Jacobs, the Corporation provided a copy of the PMP, updated to July 2011, to RDO on 24 August 2011. The Corporation indicated in their reply letter that the PMP had been developed and in place at the time of the announcement of the project delay and included elements not materially different from the elements of the master programme referred to in paragraph 7.6 of the IEP Report. All major civil and E&M contracts were shown, as were the key interfaces and handovers, the work dates for the individual contracts, the testing and commissioning and the operational readiness dates for the overall project, as well as other significant activities such as the implementation of temporary traffic management schemes and the major utility diversions.

4.67 The Select Committee notes that the Corporation also reiterated in their reply that, together with the use by the Corporation of internationally recognized and effective methodology for forecasting completion of complex railway projects, including the Track-Related Installation Programme, the Corporation had applied effective methods for monitoring the progress across the multiple contracts in the Project, in accordance with the Corporation's Project Integrated Management System.

4.68 At the hearing on 21 December 2015, the Select Committee raised with Professor Anthony CHEUNG Bing-leung a question whether the PMP had been supplied to him. Professor CHEUNG informed the

Select Committee that he knew that the Corporation had a master plan. However, he thought that it was not the master delivery strategy document mentioned by IEP. Professor CHEUNG further said that what IEP recommended was a document which should provide the metrics of performance for each of the parties that could be checked and verified throughout the course of the Project and that these metrics would include high-level milestones and key cost triggers appropriate to the different stakeholders. He considered that the document proposed by IEP was different from the master plan that the Corporation had been using.

4.69 In the light of paragraphs 4.54 to 4.68 above, the Select Committee considers that the Corporation might have a master plan showing *"a collection of individual contract programmes for Civil and E&M works"* (see paragraph 4.63). It agrees with the finding of IEP that the Corporation did not have *"a fully integrated, whole-project master programme"* (see paragraph 4.54). The effect was that *"[the Corporation] was late to recognise and forecast delays on individual contracts. This, coupled with the absence of an integrated master programme, meant that it was not possible to understand which contracts were critical to the project completion date"*.<sup>68</sup>

#### Effectiveness of DRMs to mitigate the project delay

4.70 The Select Committee has inquired into the effectiveness of the DRMs adopted by the Corporation to mitigate the project delay. Views and statements were reviewed and witnesses were questioned at the hearings to ascertain the effectiveness of the DRMs.

4.71 According to Mr Peter LAU Ka-keung, the Corporation was responsible for negotiating with the contractors for the use of DRMs to catch up with the programme plan in case of delay. With the "check the checker" role, HyD and the M&V consultant would provide the Corporation with their professional advice on the proposed DRMs.

4.72 Mr Peter LAU Ka-keung stated that, where there was any progress delay, the Corporation would be asked to consider mitigation measures to make up for the delay. In the process, the Corporation would discuss with the contractors and formulate a revised programme

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<sup>68</sup> Report of HKS of XRL Independent Expert Panel, paragraph 3.23.

for the critical components of the works. HyD would use this revised programme as a basis to continue monitoring the work progress. The existence of progress delay in the individual contracts did not necessarily imply that the overall completion of the Project would be delayed. The overall progress was also an important consideration.

4.73 At the hearing on 3 November 2015, Mr Lincoln LEONG Kwok-kuen informed the Select Committee that DRMs were important to stop any further delay, for instance, in the programme or further cost overruns, and to move a particular contract back into the original contract duration. Mr Lincoln LEONG Kwok-kuen also said that there were many examples of successful DRMs.

4.74 Mr Peter LAU Ka-keung indicated that, from experience in other major work contracts, a contractor could adopt mitigation and DRMs to catch up with progress delay. The increase in manpower, plant and work overtime would be considered. The important thing was to avoid impact on the commencement of subsequent critical work activities. Through splitting of work processes into parts and re-sequencing work flow, delayed activities could be removed from the critical path.

4.75 The Select Committee notes from the statement of Mr Peter LAU Ka-keung that the Corporation had deployed some DRMs to catch up with the programme, including the deployment of additional plant and labour resources; the adoption of alternative work procedures or work methods, e.g. using blasting instead of mechanical breaking of rock; design changes and re-sequencing work activities; re-defining the programme completion date of non-critical contracts; and the refinement of the subsequent E&M work programme, sometimes through phased access arrangements.

4.76 The Select Committee notes from the IEP Report<sup>69</sup> that it had identified instances where the Project had benefitted through DRMs, such as the procurement of an additional tunnel boring machine for tunnelling in contract 823A and the removal of piles obstructing the tunnelling activities in contract 820.

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<sup>69</sup> Report of HKS of XRL Independent Expert Panel, paragraphs 3.16 to 3.19.



*Examples of successful DRMs at contracts 823A and 802*

4.77 The Select Committee notes the successful examples of DRMs from the evidence given by Mr Peter LAU Ka-keung that in April 2011, during the construction of the launching shaft of the tunnel boring machine under contract 823A, the contractor encountered rock head levels higher than those anticipated in the Geotechnical Baseline Report. This slowed down the progress of the tunnelling works and also directly affected the commencement of the subsequent tunnel excavation works. To recover the progress delay, the Corporation proposed a series of DRMs which included the procurement of an additional tunnel boring machine to allow two tunnel sections to be excavated simultaneously. As a result, the additional tunnel boring machine was launched in March 2013. The tunnel boring excavation progress was improved after the implementation of these measures.

4.78 The Select Committee also notes another example of successful DRMs in that, in mid-2010 during the course of the pile-removal work in contract 802, the contractor found that the piles were deformed and were not straight as shown in the record drawings. Thus, the normal extraction methods could not be used. As the deformed piles were in conflict with the alignment of HKS of XRL, they had to be removed before the arrival of the tunnel boring machine. After exploring different options with the contractor, the Corporation suggested adopting a "Rotator and Wedge" extraction method from Japan to remove these piles. On 23 December 2010, the Corporation submitted the DRM proposal to the Project Control Group for approval. HyD and the M&V consultant, without indicating any disagreement<sup>70</sup>, kept on monitoring the effectiveness of the alternative method, visited the pile-removal site every month and held Contract Review Meetings with the Corporation regularly to track the removal progress. Eventually, the contractor recovered the delay successfully such that the piles were removed before the arrival of the tunnel boring machine, which was itself delayed.

4.79 The Select Committee observes that, initially, the DRMs enabled catching up on progress in certain contracts as set out in the preceding paragraphs. It is possible that these instances of success and past

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<sup>70</sup> Paper submitted by the Government to the Subcommittee on Matters Relating to Railways, LC Paper No. CB(1)1422/13-14(02), paragraphs 11 and 12.

successful experience in other railway projects boosted the confidence of the Project Team/Mr CHEW Tai-chong in recovering delays with the use of DRMs.

4.80 However, the DRMs implemented in relation to the other contracts did not have much success. The Select Committee notes that IEP found instances where the Corporation was over-optimistic on the viability of the proposed DRMs in achieving their purpose.<sup>71</sup> Besides, the Select Committee also notes from the joint statement of Mr Anthony J W KING and Mr William NG Siu-kee of Jacobs with respect to DRMs in March 2012, *"[t]here is no sign yet that the situation will improve, nor that Delay Recovery Measures instructed and Supplemental Agreements implemented to date have started to have any meaningful impact"*. The effectiveness of DRMs will be further discussed in Chapter 5.

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<sup>71</sup> Report of HKS of XRL Independent Expert Panel, paragraph 3.17.