



First Report by the Independent Board Committee on the Express Rail Link Project

July 2014

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Glossary

Term	Definition
April Presentation	12 April 2014 presentation by the PjT
Audit Committee	Audit Committee of the Board of the Corporation
Board	Board of directors of the Corporation
CEO	Chief Executive Officer of the Corporation
Chairman	Chairman of the Board
Chief Executive	Chief Executive in Council
CIAD	Corporate Internal Audit Department
CIQ	Customs, Immigration and Quarantine facilities at WKT
CRM	Contract Review Meeting
Corporate Relations Department	Corporate Relations Department of the Corporation
Corporation	MTR Corporation Limited
CWC	Capital Works Committee
Day-1	For the purposes of this report, means the full train services requirements and patronage forecast agreed with Government
DCEO	Deputy CEO of the Corporation
Dedicated Corridor Option	Hong Kong section of the ERL operating along a completely new rail corridor
DHy	Director of Highways
DRM(s)	Delay recovery measure(s)
DST	Deputy Secretary for Transport and Housing (Transport) 1
E&M	Electrical and mechanical
Entrustment Activities	All activities required for the planning, design, construction, testing and commissioning in relation to the Project, including railway works, property development enabling works and miscellaneous works
Entrustment Agreement	Entrustment Agreement dated 26 January 2010
Entrustment Programme	The programme for the execution of the Entrustment Activities

Term	Definition
Estimated Handover Date	4 August 2015, being the date set out in the Entrustment Agreement (as may be adjusted in accordance with the terms of that agreement) on which the Corporation estimated that it would formally hand over the completed Project to Government
EOT(s)	Extension(s) of time
ERL	Previous acronym for the Hong Kong section of the Guangzhou – Shenzhen – Hong Kong Express Rail Link
ExCom	Executive Committee of the Corporation
FD	Finance Director of the Corporation
Government	Government of the HKSAR
HyD	Highways Department of the HKSAR
IBC	Independent Board Committee
INED	Independent Non-executive Director
IQA	Internal Quality Audit
July Presentation	a presentation on the programme status given by the PjT to the CEO, DCEO, and FD on Saturday 13 July 2013
KCRC	Kowloon-Canton Railway Corporation
KTE	Kwun Tong Line Extension
Lands Department	Lands Department of the HKSAR
LD&S	Legal Director & Secretary
LegCo	Legislative Council, HKSAR
Lloyd's	Lloyd's Register Rail (Asia) Limited
M&V Consultant	Monitoring and verification consultant appointed by Government
MOR	Minimum Operating Requirement. MOR was the term used on occasion by members of the PjT to describe a partial opening scenario for WKT to achieve opening in 2015 (as described in the July Presentation)
NOL	Northern Link
OD	Operations Division of the Corporation
OPD	Operations Director of the Corporation
Partial Opening	Partial opening of WKT on a MOR basis
PCG	Project Control Group
PCM	Project Co-ordination Meeting
PIMS	Project Integrated Management System
PjD	Projects Director of the Corporation

Term	Definition
PjT	Project Team for the XRL. The PjT is within the Projects Division
PRC	People's Republic of China
Procurement	Procurement & Contracts Department of the Corporation
Project	XRL project
Projects Division	Projects Division of the Corporation
PSC	Project Supervisory Committee of the XRL
PST	Permanent Secretary for Transport and Housing (Transport)
RDO	Railway Development Office
REL	Regional Express Link
RSC	Legislative Council Panel on Transport Subcommittee on Matters Relating to Railways
SCL	Shatin-Central Link
Shared Corridor Option	Hong Kong section of the ERL sharing tracks with the existing West Rail
SIL	South Island Line
SQA	Self quality audit
SRA	Schedule Risk Analysis
STH	Secretary for Transport and Housing
TBM	Tunnel Boring Machine used in the construction of the XRL
THB	Transport and Housing Bureau, Government of the HKSAR
Under STH	Under Secretary for Transport and Housing
WIL	West Island Line
WKT	West Kowloon Terminus
XRL	Hong Kong section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link

This report has been prepared in English and Chinese language versions. In case of any inconsistency between the English and Chinese language versions of this report, the English version will prevail.

Part I – Executive summary

Introduction

Background

- 1.1 Following the announcement by the Corporation on *15 April 2014* of a revised completion date for the XRL of 2017 and the resultant intense public concern and criticism of the Corporation, the Board established the IBC at its meeting on *29 April 2014*. The IBC consists of six of the independent non-executive directors on the Board.
- 1.2 As part of its terms of reference, the IBC was requested by the Board to review the background of and reasons for the revised schedule for the Project. This report reflects the findings and conclusions of the IBC in that regard.
- 1.3 The IBC has prepared this report following interviews by it of certain senior executives of the Corporation and senior members of the PjT, its review of documents and other correspondence and information requested and made available to the IBC, and site visits.
- 1.4 The IBC's terms of reference are also to look forward and advise on the manner in which the Corporation can deliver the Project in a transparent and timely manner and in accordance with the Corporation's obligations under the Entrustment Agreement (as described below). The IBC will prepare a second report containing recommendations with regard to this objective following a review by the IBC of key Project milestones ahead, known difficulties and risk assessment in the light of the current status of the Project and the Corporation's obligations under the Entrustment Agreement.
- 1.5 To this end the IBC has appointed two independent experts in relation to management of projects of this type to assist it with its review. The technical findings of the IBC in this first report and its findings regarding the project management systems of the Corporation remain subject to the review of the experts appointed for the purposes of the IBC's second report.

The XRL Project

- 1.6 The XRL refers to the 26km long Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link which will run

from West Kowloon in Hong Kong to the boundary of Hong Kong and Shenzhen. The XRL will connect with the 16,000km National High-speed Railway Network in the PRC and is intended to enhance Hong Kong's role as the southern gateway to the Mainland.

- 1.7 The Project to construct the XRL is very large and complex. It involves the construction of a new underground railway system and subterranean passenger terminal in the middle of a densely populated urban area. It requires the engagement and co-ordination of multiple contractors of various specialities at each of the different phases of its programme to completion.
- 1.8 The XRL is the first railway project to be constructed in Hong Kong under the concession approach. This means that Government pays for the construction of the railway, bears the construction risk and shares the operational risk of the railway. The ownership though stays with Government and the Corporation will be invited to undertake the operation of the railway.

XRL Project framework

- 1.9 The Corporation has been entrusted by Government with the design and project management of construction of the XRL. The services of the Corporation, and obligations of Government, in relation to the construction and commissioning of the XRL, are provided under the terms of the Entrustment Agreement dated *26 January 2010* (which follows an earlier entrustment agreement for the design and site investigations entered into in 2008).
- 1.10 The Entrustment Agreement establishes the processes by which Government adopts a monitoring and verification role in the design and construction of the XRL and performs the “check the checker” role in respect of the Corporation as project manager.
- 1.11 Through participation in the PSC, PCG, PCM and CRM, members of Government from the HyD, RDO and/or THB have been given full access to the documents that are circulated and discussed at these meetings including monthly progress reports, relevant presentations materials prepared by the Projects Division and relevant documents relating to other matters discussed at the meetings.
- 1.12 The Corporation meanwhile has applied its own project management systems to manage the Project and its compliance with its obligations under the Entrustment Agreement.

Project history

- 1.13 Following approximately two years of site investigations and preparation, construction of the XRL commenced in January 2010.
- 1.14 It was always intended under the Project programme that WKT would be delivered in two phases: 10 long and short-haul tracks were expected to be handed over by August 2015 and a further five tracks in 2021 or later depending upon patronage.
- 1.15 The Project ran into delays early in its construction programme including within the WKT contract areas and also in the cross-boundary tunnelling.
- 1.16 At a meeting in April 2013 with the principal contractor at WKT, the PjT was advised by that contractor that the 2015 timetable could not be met. The contractor suggested a revised construction completion date of June 2016 for the whole of the works. The PjD did not agree to this and asked the contractor and the PjT to work together to achieve completion by the 2015 deadline.
- 1.17 Due to the escalating delays at WKT and the increasing divergence between actual progress and planned progress according to the Project programme, the PjT worked on a Partial Opening scenario in order to achieve opening by the end of 2015 (described by the PjT as the Minimum Operating Requirement or MOR).
- 1.18 Under this Partial Opening scenario, six long-haul platforms would be opened (rather than 10 long and short-haul platforms). This was considered by the PjT and the OD to be adequate to achieve targeted Day-1 capacity. A number of facilities within WKT would still be under construction at Day 1.
- 1.19 The PjD gave a report on progress of the Project to the CEO, DCEO and FD on *13 July 2013* (the July Presentation) in which he described the Partial Opening scenario and sought the consent of the members of the Executive Directorate present for an extension to the opening date of the XRL from August to December 2015. In the July Presentation the Partial Opening proposal was described as the MOR.
- 1.20 The Partial Opening plan was first proposed by the PjT to Government in August 2013. Subsequently, versions of the July Presentation were made to Government and the ExCom in

September 2013. Throughout this period, the divergence between actual and planned progress continued to escalate.

- 1.21 Having made these Partial Opening presentations to the ExCom and Government, in October 2013 the PjT formally requested the WKT contractor to assess the viability of Partial Opening as a means to achieve commencement of passenger services at WKT by the end of 2015.
- 1.22 In November 2013, Government, mindful that it was due to report to the RSC on *22 November*, expressed concerns about the Project's progress and whether a 2015 opening date was still achievable. This was particularly due to the delays in the cross-boundary tunnelling. Government told the Corporation that it was contemplating making it public at the RSC that the XRL might only commence operation after 2015.
- 1.23 The CEO and the PjD expressed disagreement with reporting to the RSC that the 2015 completion target would be delayed. The CEO and PjD were concerned that, following such an announcement, pressure could not then be put on all the contractors to maintain the then current timetable. The CEO and PjD stated that they believed it was still feasible to complete all the works and that the XRL could commence operation by the end of 2015. The PjD, while still asserting his confidence that opening could be achieved by the end of 2015, stated that the Corporation would be able to give a better view of progress in relation to the cross-boundary tunnelling in six months time (i.e. by May 2014). This would be after the TBM for the cross-boundary tunnelling had crossed to the Hong Kong side.
- 1.24 On *22 November 2013* at the RSC, Government announced that based on the latest assessment of the Corporation, the major works of the XRL could be completed by 2015 while it would take six to nine months for testing and commissioning thereafter.
- 1.25 On *30 March 2014*, as a result of a particularly heavy black rain storm, one of the tunnels in contract 823A (the Tse Uk Tsuen to Tai Kong Po tunnels) suffered severe flooding, badly damaging the TBM.
- 1.26 On *31 March 2014*, the WKT contractor presented the outcome of its review into the viability of the Partial Opening scenario to the PjT. This presentation confirmed that a 2015 opening date was unachievable even on a Partial Opening basis.

- 1.27 The PjD reported only for the first time to the ExCom that a 2015 opening date was unachievable on *12 April 2014*. Opening of the XRL was now expected in 2017. The CEO immediately informed the Chairman and the STH of the delay in the Project and began to discuss with each of them a communication strategy in relation to the delay.
- 1.28 Between *12 April* and *14 April 2014*, the Chairman, CEO and PjD variously had a number of discussions with Government regarding the revised schedule for the Project to 2017. In a meeting in the evening of *14 April 2014* Government indicated to the Chairman, CEO and PjD that the STH would make an announcement the next day.
- 1.29 The Corporation announced on *15 April 2014* that the opening date for the XRL had been delayed from an originally anticipated opening in 2015 to 2017. The Board was informed for the first time about the delay to 2017 and the reasons for delay at a Special Board Meeting on *16 April 2014*. It was at this time that the Board (including the Chairman) also first learnt of the Partial Opening proposal.

Findings and Conclusions

Reasons for delay

- 1.30 The reasons for delay to the Project are numerous. Some apply to the Project as a whole, including labour shortage issues which are affecting all construction projects in Hong Kong, other reasons vary by contract area and may relate, for example, to local geology, different site access issues in the early phases of the Project or unforeseen events occurring. More specifically, for contract 810A (WKT), progress had been and is still affected by unfavourable ground conditions, utility diversion complications, site co-ordination and inadequate work fronts. For contract 826 (cross-boundary tunnelling), progress had been affected by the late arrival of the TBMs from the Mainland. For contract 823A (Yuen Long Tunnel section), progress had been affected by the slow excavation rate of the two TBMs. The flooding of one of the TBMs has made things worse. However, the IBC has not seen any evidence to suggest that in its day-to-day work the PjT has not followed the systems and procedures established in accordance with the requirements of the Entrustment Agreement and vetted by Government and the independent M&V Consultant appointed by Government.

Partial Opening

- 1.31 The Partial Opening proposal was born as a result of the delays at WKT. It was not a unilateral solution that could be imposed on Government under the terms of the Entrustment Agreement. If implemented, this would have been a material change to the Project programme which would have required the agreement of Government.
- 1.32 It is the IBC's view that the distinction between operational matters, which are within the authority of the ExCom, and strategic matters of public importance, which should be escalated to the Board, was not given sufficient attention by the ExCom after it had been made aware of the Partial Opening proposal. The IBC finds that the failure to report the Partial Opening proposal by the ExCom to the Board reflects poor judgement in particular on the part of the PjD (when taking into account his role and responsibilities as overall projects director of the Corporation) and the CEO (when taking into account his role and responsibilities as chief executive officer of the Corporation).

Entrustment Agreement

- 1.33 All contracts for the Project are subject to variations in time and cost due to unforeseen circumstances and changes that may be required. In a vastly complex engineering project such as the XRL, unforeseen events will happen. The Corporation agreed under the terms of the Entrustment Agreement to use its best endeavours to complete the Project by the original estimated completion date in August 2015.
- 1.34 Since the commencement of the Project, the Corporation has implemented processes and procedures to ensure that it is carrying out its obligations under the Entrustment Agreement. Government has been constantly monitoring the Project within the framework provided in the Entrustment Agreement.

Corporation's project management

- 1.35 The IBC believes that the PjT has managed the engineering aspects of the delays in the Project arising from a number and wide variety of circumstances and events in a professional manner.
- 1.36 Notwithstanding this conclusion, the IBC has appointed two independent experts to review the Corporation's project management

systems and processes in respect of the Project. They will then be asked to propose any enhancements they may see as appropriate.

Reporting to Government

- 1.37 The IBC believes that through the life of the Project, members of the PjT and Government representatives have worked together in a co-operative and collaborative manner. Delays against the Project programme have been reported on a timely basis and accurately to Government in accordance with the terms of the Entrustment Agreement. The IBC does not find any attempt by the PjT or the Corporation to cover-up or hide the delays being experienced in the various Project contracts. However, Government was often assured by the Corporation that delays in the Project could be recovered to achieve opening in 2015.
- 1.38 The PjD did not communicate with Government regarding the mounting concerns of the PjT expressed in November 2013 as to the cumulative effect of delays across key parts of the Project and that, as a result, the completion date would fall in 2016.
- 1.39 The IBC believes that while Government clearly had access to a great deal of information about the delays on the various contracts, it should have been given a fuller assessment of the achievability of the overall Project timetable.

Reporting on the Project to the CEO, ExCom, Audit Committee, Board and Chairman

- 1.40 Within the Corporation there are a number of matters delegated by the Board to be dealt with by the ExCom without needing to be referred back to the Board for approval.
- 1.41 However, the IBC finds that important matters relating to the Project were not brought to the attention of the Chairman, Audit Committee or Board. The result was that the Board could not monitor effectively the progress of the Project and provide guidance and, where necessary, challenge the views and actions of the CEO, PjD and the other members of the Executive Directorate in relation to the Project.
- 1.42 Indeed, when the PjD was questioned by independent non-executive directors of the Board at its meetings on *22 August* and *10 December 2013* about the progress of the Project, he had consistently responded

that the Project would be delivered on time and within budget. He never suggested that the cumulative effect of various contract delays, including on contracts 810A and 826, was making the anticipated timetable irretrievable (whether or not on a Partial Opening basis). He also did not report fully and accurately to the CEO, ExCom, Audit Committee or Board information presented by the PjT indicating their concerns about the delivery of the Project.

- 1.43 The CEO has indicated to the IBC that, in addition to attending a number of ExCom meetings at which certain members of the PjT were present with the PjD, he also met with the PjD individually and reviewed with him the status of the Project on a frequent basis. In those meetings the CEO had accepted and relied in good faith upon the assurances given to him by the PjD that notwithstanding the delays the Project would still complete by the end of 2015 on a Partial Opening basis.
- 1.44 The IBC believes that the PjD should have responded directly and openly to the questions and concerns raised by members of the Board as to whether the Project was on time to complete by 2015 and on budget.
- 1.45 When asked by the IBC as to why he did not report the concerns of the PjT, the PjD stated that, pending a response from the contractor at WKT to the Partial Opening plan proposed by the PjT, he believed that there was still time to the end of 2015 for DRMs to be implemented and be effective. It is also unfortunate that there was a “chain of command” style of approach within the PjT as to who did the talking so that caution and concerns were not openly raised by others to challenge the PjD’s assertions that an opening for the XRL in 2015 was achievable and the PjD’s failure to notify the CEO, ExCom, Audit Committee and Board of such concerns of the PjT.
- 1.46 The PjD’s assertions that the cumulative delays could be recovered were misconceived and should have been acknowledged by the PjD as such much earlier than was the case. The CEO and ExCom were collectively relying on the information and views provided by him.
- 1.47 Notwithstanding the above, given the CEO’s knowledge of the sustained delays in the Project programme and particularly given the importance of the Project to Government, and the level of public interest in it, the IBC believes that the CEO should have exercised more critical judgement in respect of monitoring the progress of the Project as a whole.

Communication strategy and crisis management

- 1.48 The CEO and other members of the ExCom (except the PjD) were not aware of the delay in the Project timetable to 2017 until it was presented to them by the PjD at the meeting on *12 April 2014*. However, the PjT had been projecting the likelihood of delays beyond 2015 since November 2013 and this had not been communicated by the PjD to the CEO and ExCom.
- 1.49 Consequently, the ExCom at that meeting, and without any prior preparation or any communication plan, had immediately to review the Corporation's position in terms of communication of the delay to Government and the Hong Kong public, provide a feasible likely completion date for the Project and mitigate the resulting lack of credibility that the Corporation would suffer due to the inability to deliver the Project in line with the assurances given to Government. The CEO immediately informed the Chairman and the STH of the delay in the Project and began to discuss with each of them a communication strategy in relation to the delay.
- 1.50 Government indicated to the Chairman, CEO and PjD on *14 April 2014* that the STH would make an announcement the next day. The Corporation meanwhile prepared a press statement and press briefing for release on *15 April 2014*. Their content was initiated and co-ordinated by the General Manager - Corporate Relations and circulated for review to the senior members of the PjT, the PjD, the CEO, certain other members of the ExCom and the Chairman for their comment and approval.
- 1.51 Although the CEO had contacted the Chairman immediately upon learning of the delay on *12 April*, at no time prior to the issue of the press release did the Chairman or CEO raise the possibility of calling an emergency Board meeting to discuss the Project delay.
- 1.52 The IBC finds that:
- (A) the failure of the PjD to communicate the likelihood of delays had deprived the Corporation of the opportunity to manage the situation in which it found itself on *12 April* and the following few days in the best possible way;
 - (B) although the Chairman was promptly notified by the CEO of the delay and was advised on the communication strategy, an emergency Board meeting should have been called prior to the

press briefing or the release of a press statement on *15 April 2014* to review a detailed communication strategy for announcing the delay and steps to be taken to achieve the earliest possible opening of the XRL for passenger services;

- (C) the Corporation should have given a press conference on *15 April 2014* as opposed to a press briefing;
- (D) notwithstanding the CEO had been advised not to attend the Corporation's media briefing on *15 April 2014*, in recognition of the importance given to the Project by Government and the public, particularly in the light of the statement made by the STH at the Government media stand-up earlier that day, the CEO should have led the press briefing as opposed to the PjD;
- (E) by its tone and content the press statement materially overstated the effect on the Project programme of the flooding of the TBM (contract 823A);
- (F) the Corporation's media management does not appear to have been effective in the days following the press statement and press briefing; and
- (G) while the genesis of the crisis on the XRL was the delay itself, poor communication management led to the delay becoming a crisis; and
- (H) all of the above led to a serious loss of credibility for the Corporation.

Recommendations

1.53 As a result of its findings and conclusions, the IBC recommends that there should be certain enhancements to the Corporation's systems and processes:

- (A) the Board should review with the ExCom the format and content of future project reporting to the Board and the Audit Committee to ensure that both are presented with clear and comprehensive information regarding the projects underway as well as being advised of the critical challenges facing each project. There should also be a review of financial progress of each project. The reporting on individual projects as above should then be summarised for the Board and the Audit

Committee by the PjD, signed off by Project Programming and Procurement teams and endorsed by the CEO and the FD;

- (B) the Board should establish a Capital Works Committee to oversee in the future any project involving design and/or construction with a capital value of a certain material size as assessed by the Board. Each relevant project should be the subject of quarterly review by the CWC.

The CWC would consist of such members as the Board determines and be chaired by an INED. The principal intention of the CWC is to report to the Board on the progress of the relevant projects and their respective budgets;

- (C) the ExCom should review its system of allocating clear accountability for actions required and for subsequent follow-up that those actions have been taken;
- (D) the Board and the ExCom should encourage a culture of healthy debate and constructive challenge by all team members within the Corporation;
- (E) recognising that corporate communications are a strategic matter for the Corporation, the IBC urges the Board to undertake a comprehensive review of the Corporation's communications strategy with the aim to improve transparency, timeliness and pro-active engagement with stakeholders, particularly the public; and
- (F) the IBC recommends a review of the corporate relations planning in respect of progress of projects, including a review of the flow of information among the PjT, ExCom and Corporate Relations Department as well as how the Projects Division identifies and anticipates issues for communication.

Acknowledgement

- 1.54 The IBC wishes to acknowledge and is grateful for the co-operation it has received from all staff and officers of the Corporation whom it has approached for assistance in the preparation of this report or whom it has asked to give evidence during its review.

Part II – Introduction

Background

- 2.1 The IBC of the Corporation was established by authority from the Board on *29 April 2014* to:
- (A) review the background of and reasons for the recently announced revised schedule for the Project;
 - (B) looking forward, advise on the manner in which the Corporation can deliver the Project in a transparent and timely manner and in accordance with the Corporation's responsibilities under the entrustment agreements between the Corporation and Government dated *24 November 2008* and *26 January 2010*; and
 - (C) report to the Board on the matters set out in this paragraph within the timeframe set by the Board.
- 2.2 The IBC consists of six independent non-executive directors of the Corporation. The members of the IBC are listed at Appendix 1. Also at Appendix 1 is a record of the meetings to date of the IBC.
- 2.3 This report contains the IBC's findings in respect of (A) above.
- 2.4 The IBC's terms of reference are also to look forward and advise on the manner in which the Corporation can deliver the Project in a transparent and timely manner and in accordance with the Corporation's obligations under the Entrustment Agreement. The IBC will prepare a second report containing recommendations with regard to this objective following a review by the IBC of key Project milestones ahead, known difficulties and risk assessment in the light of the current status of the Project and the Corporation's obligations under the Entrustment Agreement.
- 2.5 To this end, the IBC has appointed two independent experts who have specific expertise in relation to management of projects of this type to assist it with its review.
- 2.6 The IBC will look to issue its second report with respect to the above in October 2014.

- 2.7 The IBC is also mindful of the report to be prepared by Government's own independent expert panel chaired by the Honourable Mr. Justice Hartmann. The IBC will review such report when issued to determine whether it refers to any additional processes or arrangements in relation to the Project which should be recommended to the Board for implementation. Similarly, the IBC notes that a LegCo select committee has been established to review and report on the Project. The IBC will consider such report in due course.
- 2.8 The successful management of the Project is a matter of great concern to the IBC. This report reflects the findings and conclusions of the IBC in relation to the background of and reasons for the delay in the Project's completion. It follows the IBC's interviews with the CEO, PjD and other members of the Corporation's ExCom, certain key PjT members and a review of documents and other correspondence and information requested and made available to the IBC.
- 2.9 The IBC has not had meetings with Government officials or contractors involved in the Project. The IBC will keep under review the need for any meetings with contractors during the preparation of its second report.
- 2.10 This report first examines, in Part III, the framework for the Project including its internal systems, controls and management as well as the external control and checking functions operated by or on behalf of Government. The report then provides a history of the Project at Part IV. This is not intended to be a comprehensive history of all events affecting the Project. Most, if not all of, the events described in Part IV have been described previously (in varying levels of detail) in public by various stakeholders in the Project. The events referred to in this report, however, are those which the IBC views as informative in respect of the manner in which the Project has been managed.
- 2.11 The IBC's findings and conclusions are set out in some detail at Part V of this report. Finally, taking into account its findings and conclusions, the IBC has made a number of recommendations in Part VI for consideration by the Board. The independent experts appointed by the IBC as referred to above will also be requested to validate the findings of the IBC in this report to the extent such findings relate to technical matters or project management procedures and processes regarding the Project. In this way, to the

extent there are areas in relation to the project management procedures and processes that the independent experts believe need improvement or change or if there are lessons to be learnt from past implementation of the Project entrusted to the Corporation, then these can be highlighted by the IBC in its second report.

2.12 The IBC confirms that it has acted independently, consistent with its terms of reference, in making the findings, reaching the conclusions and making the recommendations which it now presents in this report.

2.13 The IBC wishes to acknowledge and is grateful for the co-operation it has received from all staff and officers of the Corporation whom it has approached for assistance in the preparation of this report or whom it has asked to give evidence during its review.

XRL Project

2.14 The Project refers to the construction of the 26km long Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link running from West Kowloon in Hong Kong to the boundary of Hong Kong and Shenzhen. The XRL will connect with the 16,000km National High-speed Railway Network in the PRC and is intended to enhance Hong Kong's role as the southern gateway to the Mainland. Construction of the XRL commenced in January 2010.



Route of the XRL

- 2.15 The Hong Kong section of the XRL is entirely underground. Trains will run in two parallel underground tunnels, one up-tunnel (for trains travelling north) and one down-tunnel (for trains coming into Hong Kong).
- 2.16 Once operational, trains are expected to travel at up to 200km/h between WKT, the terminus in West Kowloon, and Shenzhen.

WKT

- 2.17 Occupying an area of 11 hectares, WKT is a large, four-storey underground structure with the lowest level located 30m below ground. The terminus building will house 15 platforms serving both long-haul and short-haul high-speed train services, passenger departure and arrival halls and a ticketing hall. The main public area of the terminus incorporates a large atrium with a complex steel-framed glazed roof structure.
- 2.18 WKT lies within the reclamation area of land bounded by Kowloon Station on the west, Austin Station on the east and Victoria Harbour on the south. It is traversed by several trunk roads including Austin Road West, Lin Cheung Road and Jordan Road. The associated works also include the underground reconstruction of Austin Road West and Lin Cheung Road to produce a traffic-free piazza to the south of the terminus.



Location and contract areas for WKT



Artist's impressions of the completed WKT roof (L) and interior (R)

- 2.19 WKT is divided into four major civil works construction contracts covering the approach tunnels at the north end of the terminus which lead to the main running tunnels, and the terminus building itself.
- 2.20 Construction of WKT has faced significant challenges and delays since the commencement of works which have affected the overall progress of the Project. The presence of operating railway lines, high rise buildings and busy main roads add to the complexity of the engineering challenges being posed.
- 2.21 One challenging area of the WKT works is the north top-down area of the terminus where the 15 tracks will merge towards the two running tunnels (in contracts 810A and 811B). This area lies beneath the yet to be reinstated Jordan Road where construction of the terminus requires the slab at B1 level to be completed first to act as a solid strut between the completed diaphragm walls, and serve to prevent unacceptable ground settlement, before excavation can continue below. Owing to the interdependency of works and the complexity of interfaces between the adjacent contracts, as is explained in more detail below, delays to the contract 811B works caused delays to contract 810A accessing the site in the contract 810A area to construct the north top-down part of the terminus building.

The tunnels

- 2.22 The tunnel engineering required for the Project is unprecedented in Hong Kong. The 26km of tunnel alignments with twin tracks between WKT and the boundary of Hong Kong and Shenzhen are divided into eight contract areas. Each contract area has raised very different logistical, engineering and geological challenges, not least the challenge of driving what are often deep tunnels with only very limited surface access. Methods of construction have varied for

different contract areas depending upon local conditions but may be divided into three main methods: cut and cover tunnels, drill and blast tunnels and bored tunnels (using TBMs).

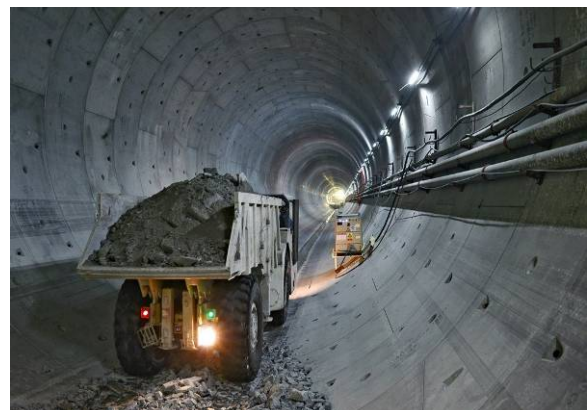
Entrustment agreements

- 2.23 Since the implementation of the rail merger between the Corporation and KCRC, a philosophy has been established that railway projects which are natural extension projects for the Corporation will be built, owned and operated by the Corporation (the ownership approach), but, for individual new railway projects that are not natural extensions of the Corporation's railway infrastructure, Government has discretion to determine whether to adopt the concession approach or ownership approach.
- 2.24 Under the concession approach Government pays for the construction of the railway, bears the construction risk and shares the operational risk of the railway. The ownership though stays with Government and the Corporation will be invited to undertake the operation of the railway. Service concession payments are then made by the Corporation to Government when it operates the railway owned by Government.
- 2.25 The XRL is being constructed between Government and the Corporation on the concession approach. Therefore the Corporation has been entrusted with the design and management of construction of the XRL subject to Government's approval processes. The services of the Corporation under the design and site investigation phase of the Project were provided under the terms of the Entrustment Agreement between Government and the Corporation dated *24 November 2008*. The services of the Corporation in relation

Typical drill and blast tunnel under construction



Typical TBM tunnel before track laying



to the construction and commissioning of the XRL are provided under the Entrustment Agreement dated *26 January 2010*. In this report references to the Entrustment Agreement are to this second 2010 agreement unless stated otherwise.

- 2.26 For its services under the Entrustment Agreement, Government pays the Corporation a fee in stages calculated to reimburse the Corporation for its cost of providing its project management services under the terms of the Entrustment Agreement.
- 2.27 Further details regarding the terms of the Entrustment Agreement are provided in Part III below.

Typical TBM with trailer units



Typical TBM cutter head



Part III – XRL Project framework

Entrustment Agreement

- 3.1 The Entrustment Agreement for the construction and commissioning of the XRL was entered into on *26 January 2010* between the Corporation and the STH for and on behalf of Government. The key provisions of the Entrustment Agreement include the following:
- (A) the Corporation will carry out or procure the carrying out of the Entrustment Activities;
 - (B) the Corporation will let all contracts with contractors and consultants under its conditions of contract and act in accordance with certain of its management systems and procedures specified in the Entrustment Agreement;
 - (C) the Corporation will be responsible for the care of all works constructed under the Project from the commencement of construction until the date of handover of those works to Government and for completing or procuring the completion of any outstanding works and/or defective works identified prior to the handover of the works;
 - (D) in reaching any commercial settlements with contractors and consultants which are not strictly in accordance with the terms of the relevant contract or which amend the terms of the relevant contract, the Corporation will seek to ensure that such settlements are in the best interests of the Project, shall act in accordance with its relevant commercial settlement procedures and shall in a timely manner consult with the PSC in respect of any proposed commercial settlement before such settlement is considered by the PCG;
 - (E) the Corporation will provide to Government by the end of each calendar month, a progress report on the Entrustment Activities that were carried out in the immediately preceding calendar month and, within three months following the earlier of handover of the Project to Government or termination of the Entrustment Agreement, a final report on the Entrustment Activities;
 - (F) during the period of 12 years following the issue of a certificate of completion by the Corporation in respect of work

carried out under any contract with any third party, the Corporation shall be responsible for the repair of any defects in such work that are identified following the expiry of any defects liability period under the relevant contract;

- (G) the Corporation must use its best endeavours to complete, or procure the completion of, the Entrustment Activities in accordance with the Entrustment Programme and minimise any delay or other effect which any modifications made may have on the Entrustment Programme. According to the Entrustment Programme, the Estimated Handover Date is *4 August 2015*;
- (H) the Corporation warrants that:
 - (i) in the case of those Entrustment Activities that relate to the provision of project management services, such activities shall be carried out with the skill and care reasonably expected of a professional and competent project manager;
 - (ii) in the case of those Entrustment Activities that relate to the provision of design services, such activities shall be carried out with the skill and care reasonably to be expected of a professional and competent design engineer; and
 - (iii) in the case of those Entrustment Activities that relate to the carrying out of construction activities, such activities shall be carried out with the skill and care reasonably to be expected of, and by utilising such plant, goods and materials reasonably to be expected from, a competent and workmanlike construction contractor;
- (I) in consideration of the Corporation executing or procuring the execution of the Entrustment Activities and carrying out its other obligations under the Entrustment Agreement and the entrustment agreement dated *24 November 2008*, Government shall pay to the Corporation HK\$4.59 billion;
- (J) Government is required to bear (i) any costs payable to contractors and consultants engaged in connection with the Entrustment Activities, (ii) any charges, costs or amounts payable to any Government department, bureau, agency or

body in relation to the activities to be carried out under the Entrustment Agreement and (iii) all land acquisition, clearance and related costs (including all amounts arising as a result of any claim for compensation by any third party) and those costs which are incurred by the Lands Department in connection with the Project;

- (K) Government will use reasonable endeavours to provide the Corporation with assistance of a non-financial nature, including taking all reasonable steps to procure that all necessary licences and consents, required in connection with the design, construction and operation of the XRL are given or granted;
- (L) Government has agreed that the Corporation has been asked to proceed with construction, testing and commissioning of the XRL (pursuant to the Entrustment Agreement) on the understanding that the Corporation will be invited to undertake the operation of the XRL under the concession approach;
- (M) under the terms of the Entrustment Agreement, either of Government or the Corporation may propose amendments in writing to the Entrustment Programme, the scope of the Entrustment Activities and/or the scope of the Project. If the relevant party wishes to proceed with the modification proposed by it, the parties will endeavour to agree on the terms of such modification;
- (N) Government has the right to claim against the Corporation if the Corporation breaches the Entrustment Agreement and to be indemnified by the Corporation in relation to losses incurred by Government as a result of the negligence of the Corporation in performing its obligations under the Entrustment Agreement or breach by the Corporation of the Entrustment Agreement;
- (O) the Entrustment Agreement commences on *26 January 2010* and remains in full force and effect until the completion of the Entrustment Activities or until terminated earlier in accordance with the terms of the Entrustment Agreement; and
- (P) each of Government and the Corporation shall use reasonable endeavours to co-operate with the other in relation to the preparation of any submission or other document to various authorities including LegCo and relevant District Councils.

The Corporation's internal project management

Project Control Group

- 3.2 The PCG is an internal working group within the Corporation. The HyD is permitted to nominate and does nominate its representatives to attend the meetings of the PCG. The PjT and certain members of the Projects Division are also required to attend meetings of the PCG. Figure 1 shows the frequency of meeting and the composition of the PCG.

Frequency	PCG meetings are held weekly
Chairman	PjD or a member of the Executive Directorate
Members	Operations Director General Manager – Procurement & Contracts General Manager – WIL/SIL General Manager – XRL General Manager – XRL Tunnels General Manager – XRL Terminus General Manager – WIL/SIL General Manager – SCL General Manager – KTE General Manager – Projects Management Head of Projects Engineering Chief Civil Construction Engineer Head of Property Project Financial Controller – Projects
Secretary	Manager – Project Secretariat
In attendance	Procurement & Contracts Manager – HK Projects (Civil) Procurement & Contracts Manager – HK Projects (E&M) Chief Architect Chief E&M Engineer Chief Civil & Planning Engineer Manager – Estimating, Cost Control & Logistics Technical Assistant to PjD Representatives from the HyD / RDO

Figure 1. Frequency of meeting and composition of the PCG.

Terms of reference of the PCG

3.3 The latest version of the terms of reference of the PCG were adopted on *27 October 2011*.

3.4 According to the terms of reference, the objectives of the PCG are, inter alia:

- (A) to control the cost of all new projects (excluding those outside Hong Kong) within the powers delegated by the ExCom in order to ensure that the projects are completed on time and within budget to an approved quality;
- (B) to review, endorse or otherwise papers, Change Forms and Forms F1 to ensure timely decisions on matters of a value greater than HK\$10 million for individual consultancies and greater than HK\$20 million for other expenditure (individual contracts and purchase orders);
- (C) to review and endorse project procurement (contract) strategies;
- (D) to review and endorse project programmes and any amendments thereto;
- (E) to meet, on a monthly basis:
 - (i) to review, endorse or otherwise, and refer to the ExCom monthly cost reports including current expenditure, current commitment to expenditure and forecast capital costs and information for the whole of the project.
 - (ii) to modify, and to consider for recommendation to the ExCom, mitigation proposals where unacceptable cost trends are developing.
 - (iii) to review controllers budget submissions in terms of whole of project cost and make appropriate recommendations to the ExCom, and
- (F) to receive project risk summary reports and review the trend in significant project risks for new projects.

Projects Division Organisation

- 3.5 The Projects Division, headed by the PjD, is responsible to the ExCom for the planning, design and construction of railway projects approved by the Board to the required safety, quality, environmental, engineering and other standards, within the approved budget and programme.
- 3.6 To achieve this objective the Projects Division bears a significant responsibility not only to fare-paying passengers who will ultimately use the railway and the public who may be affected during the construction of the railway projects, but also to the other Divisions of the Corporation which will have responsibility for operating and maintaining the railway.
- 3.7 Procurement also has a substantial involvement in the management of the projects, and this is reflected in the integrated organisational structure in the Projects Division.
- 3.8 Property developments associated with railway projects are also the responsibility of the Property Division. The Projects Division and the Property Division therefore work together closely, particularly in the early stages of design development, to ensure that the interests of both Divisions are properly addressed.
- 3.9 The senior management within the Projects Division who have been involved in the Project include (but are not limited to) the individuals listed in Figure 2.

Name	Position within the Corporation / Area of responsibility
Mr. Tai-Chong Chew	Projects Director (appointed on 1 February 2010) (due to retire from 28 October 2014)
Mr. Antonio Choi	General Manager-XRL
Mr. Henry Young	Chief Programming Manager
Mr. Alan Myers	General Manager-XRL Terminus (retired from the Corporation in May 2014)
Mr. Simon Tang	General Manager-XRL Tunnels
Mr. Mark Lomas	Project Manager-XRL Terminus (Controls)
Mr. Calum Smith	Project Manager-XRL Terminus (Production)
Mr. Bill Clowes	Project Manager-XRL Tunnels (South)
Mr. Simon Mui	Project Manager-XRL Tunnels (North)
Mr. Bernard Chui	Programming Manager for XRL

Figure 2. Members of senior management within the Projects Division involved in the Project.

See Appendix 2 for an organisation chart for railway projects, which includes the reporting lines of various departments within the Projects Division.

See Appendix 3 for an organisation chart for a project management team.

Project Management Control and Systems

Project Integrated Management System

- 3.10 The Projects Division maintains a PIMS which contains various practices notes and project manuals that address different aspects of project management.
- 3.11 During the 16 month period up to April 2014, seven new and 19 revised documents have been introduced to the PIMS.
- 3.12 Project manual “MAN/005 – Project Management and Control” describes six areas of project management controls, namely, technical standards, safety standards, policies, progress reporting, cost reporting and commissioning.
- 3.13 MAN/005 also outlines the roles of other departments and Divisions within the Corporation that are involved in implementing projects, including, Legal & Procurement, Commercial & Marketing, Property, Finance, Operations and others. See Appendix 4 for an organisation chart for railway projects, which shows the interaction between the Projects Division and other departments and Divisions within the Corporation.

Management and control of the Project

- 3.14 To ensure that adequate internal controls and effective implementation of planned arrangements and audits were carried out throughout the design and construction to-date of the XRL, a number of internal audits were carried out. The findings from these audits are brought to the attention of the relevant individuals so that necessary actions can be taken.
- 3.15 The following specific project management and controls in place in relation to the Project include:
 - (A) SQAs of Project management had been conducted on members of the Projects Division who were involved in the Project to

confirm compliance with the PIMS. These audits were reviewed and initiated by relevant General Managers and Project Managers of the XRL. As at June 2014, a total of 20 SQAs have been conducted. SQA auditors are trained and recruited from within the various project teams of the Projects Division, and are independent from the area of work for which they have direct responsibilities. In respect of the Project, the results of the SQAs were satisfactory and areas of improvement identified focussed on revisions to various practice notes and manuals within the PIMS.

- (B) In 2013, the Project Quality section of the Projects Management Office of the Corporation carried out an annual IQA on the Project, with a focus on government interface management. No deficiencies were reported.
- (C) The Project Engineering Department of the Corporation has carried out over 50 technical audits on the Project to confirm compliance with technical topics such as design parameters, software and interfacing. No significant issues were reported.
- (D) The CIAD has carried out regular audits of the five current construction projects of the Corporation (including the Project). As at April 2014 the CIAD confirmed that adequate internal controls were in place for the Project. Findings arising from the CIAD audits were promptly addressed by the relevant teams and included findings and recommendations in the following areas: works programme review checklist, project planning databank, reporting of programme variance, technical assessment of tenders and the approval of changes to the General Manager fund.

Executive Directorate and Executive Committee

Composition

3.16 The Executive Directorate and the ExCom comprise the individuals listed in Figure 3.

Name	Position within the Corporation
Mr. Jay Walder	Chief Executive Officer
Mr. Lincoln Leong	Deputy Chief Executive Officer
Mr. Morris Cheung	Human Resources Director
Mr. Tai-Chong Chew	Projects Director
Mr. Jacob Kam	Operations Director
Mr. Stephen Law	Finance Director
Ms. Gillian Meller	Legal Director and Secretary
Mr. David Tang	Property Director
Ms. Jeny Yeung	Commercial Director

All members of the Executive Directorate are also members of the ExCom. The following general manager is a member of the ExCom but not the Executive Directorate:

Ms. May Wong	General Manager – Corporate Relations
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Figure 3. Members of the Executive Directorate and the ExCom.

Frequency of meetings

3.17 The ExCom meets regularly twice a week:

- (A) one meeting is for the purposes of executive communications, where the Deputy OD and Chief of Operations are regular attendees in addition to ExCom members. At this meeting, brief routine reports regarding business, financial, operational, organisational and media issues are given by the ExCom members and other invited attendees. Presentations to update the ExCom on specific matters may also occasionally be made at this meeting; and
- (B) the other meeting is the more formal Executive Committee meeting. The regular participants at this meeting are limited to members of the ExCom and the General Manager – Governance and Risk Management (as Secretary). At this meeting, updates, matters and transactions of a substantive nature are presented, deliberated and decided upon by the ExCom.

3.18 The ExCom may also meet as often as required in relation to matters arising.

Functions of the ExCom

3.19 At the regular meetings of the ExCom, matters submitted and presented to the ExCom are discussed by members of the ExCom.

When invited by the members of the ExCom, the senior managers of various departments within the Corporation may also present updates relating to their work. The ExCom considers issues raised and comes to a collective view as to how these issues and matters should be resolved. The ExCom may also come to a view as to the matters that require consideration by the Board.

- 3.20 The ExCom's meetings are minuted by the General Manager - Governance and Risk Management. Prior to each ExCom meeting, members of the ExCom are provided with a pack of materials which will be discussed at the meeting. As a general rule, at the last meeting of the ExCom in each month, drafts of all the minutes of the ExCom meetings held in the preceding month (which are included as part of the meeting material pack circulated) are approved. In addition, monthly reports of members of the ExCom (with the exception of the CEO, LD&S and General Manager – Corporate Relations) are submitted to the ExCom usually at the last meeting of the ExCom each month.

Relationship of the ExCom, the Executive Directorate and the Board

- 3.21 The overall management of the Corporation's business is vested in the Board. The Board has delegated the day-to-day management of the Corporation's businesses to the ExCom, while the Board focuses its attention on matters affecting the Corporation's overall strategic policies, corporate governance, finances and shareholders. These issues include financial statements, dividend policy, significant changes in accounting policy, annual operating budget, certain material contracts, strategies for future growth, major financing arrangements and major investments, corporate governance functions, risk management strategies, treasury policies and fare structures.
- 3.22 At Board meetings, members of the Executive Directorate (and when invited, senior managers of various departments) report to the Board on their respective areas of business, including railway operations, commercial and retail business, project progress, property, financial performance, legal issues, safety governance, risk management, corporate governance, human resources, sustainability and corporate responsibility.

Chief Executive Officer

- 3.23 The CEO is Mr. Jay Walder. He supervises the Executive Directorate and is the Chairman of the ExCom.

Communications with the Chairman

3.24 Since his appointment, the CEO has had regular meetings and telephone conversations with the Chairman. While the focus of these discussions has varied depending on matters arising within the Corporation, the topics discussed have included matters relating to strategy, the fare adjustment mechanism, financial performance, various projects' progress, and external communications.

Briefing of the Chairman

3.25 A formal procedure is in place for the CEO to brief the Chairman in advance of each Board meeting. These briefings are also attended by the LD&S. Depending on the agenda of the relevant meeting, other members of the Executive Directorate may attend as required (e.g. the FD attends the relevant briefing before the Board's consideration of the annual accounts).

3.26 Additional briefings are arranged by either the Chairman or the CEO and the agenda is agreed upon by both. In some instances, there are presentation materials for discussion and in others, the discussion may be more informal.

3.27 Since the appointment of the present CEO, as well as operational matters and incidents, these additional briefings to the Chairman have related to certain strategic areas with broad impact for the Corporation, including, the development of the Listening and Responding Programme, the update of corporate strategy, the review of the fare adjustment mechanism and the railway development strategy update being conducted by Government.

Other informal discussions and co-operation with the Chairman

3.28 Other regular informal meetings and discussions have taken place between the CEO and the Chairman. The CEO and the Chairman have also undertaken visits to certain project sites, including the sites of the WIL and the XRL.

Chairman of the Board

3.29 The positions of Chairman of the Board and CEO are distinct and separate. The non-executive Chairman is responsible for, chairing and managing the operations of the Board (including calling Board meetings), as well as monitoring the performance of the CEO and

other members of the ExCom.

- 3.30 The Chairman provides leadership for the Board and ensures views on all appropriate issues are discussed by all directors (including the non-executive directors) by encouraging them to contribute fully to the discussion.
- 3.31 The Chairman also actively engages with the CEO on significant issues relating to the Corporation.
- 3.32 The current Chairman is Dr. Raymond Ch'ien.

Audit Committee

Frequency of meetings

- 3.33 The Audit Committee meets on a fixed pre-determined calendar basis four times a year with additional meetings being called on an *ad hoc* basis as and when considered appropriate. The external auditor of the Corporation or the FD may request a meeting of the Audit Committee if either considers it necessary. The external auditor and the FD have access to the Chairman or any other member of the Audit Committee in relation to any matter falling within the scope of work of the Audit Committee.

Terms of reference

- 3.34 Under its Terms of Reference the duties of the Audit Committee are broadly: (i) to oversee the relationship with the external auditor; (ii) to review the financial information of the Corporation; and (iii) to oversee the Corporation's financial reporting system and internal control procedures.

Review of financial information

- 3.35 With respect to the financial information of the Corporation, the Audit Committee monitors the integrity of financial statements, annual and interim reports and accounts, together with the preliminary announcement of results and other announcements regarding the Corporation's financial information to be made public.
- 3.36 In consideration of this financial information, the Audit Committee liaises with the Board and the ExCom. The Chairman of the Audit Committee further meets on an *ad hoc* basis with the Head of

Internal Audit and representatives of the external auditor, as required, and further communicates with the Chairman and the CEO as he considers appropriate.

- 3.37 The PjT reports twice a year to the Audit Committee on all projects. Presentations are given by the PjD which usually last for around 30 minutes.
- 3.38 Apart from considering issues arising from the audit, the Audit Committee also discusses any matters that the Head of Internal Audit or the external auditor may wish to raise either privately or together with the ExCom.

Oversight of the Corporation's financial reporting system and internal control procedures

- 3.39 The Audit Committee is required to review, at least annually, the effectiveness of the Corporation's financial controls, internal control and risk management systems and to report to the Board that such a review has been carried out. These controls and systems allow the Board to monitor the Corporation's overall financial position.

Board meetings

Frequency of meetings and resources

- 3.40 The Board meets regularly and all members of the Board may take independent professional advice at the Corporation's expense, if necessary and in accordance with approval procedures.

Functions and proceedings

- 3.41 The draft agenda for regular Board meetings is prepared by the LD&S based on: (i) the regular reports submitted by members of the ExCom; (ii) any periodic update items; and (iii) any *ad hoc* items requiring approval or noting. The draft agenda is then discussed and agreed with the ExCom. Members of the Board are advised to inform the Chairman or the LD&S not less than one week before the relevant Board meeting if they wish to include a matter in the agenda of the meeting. The agenda together with Board papers are sent at least three days before the intended date of the Board meeting.

- 3.42 The CEO also submits an Executive Summary which focuses on overall strategies and principal issues of the Corporation. These summaries, together with the discussions at Board meetings ensure that members of the Board have an understanding of the Corporation's businesses and provide information to enable them to make informed decisions. The Board also receives regular reports from each of the members of the ExCom together with updates on certain aspects of the Corporation (e.g. an update on new railway projects is provided to the Board on a six-monthly basis). The members of the ExCom individually present their reports to the Board and answer questions.
- 3.43 All members of the Board have access to the advice and services of the LD&S who is responsible for ensuring that Board procedures are followed and advises the Board on corporate governance matters. The members of the Board also have full access to members of the ExCom as and when they consider necessary.

Project management by Government

Interface between Government and the Corporation

- 3.44 Government is also very involved in management of the Project. Appendix 5 illustrates the interface and reporting lines between: (i) internal controls within the Corporation (including, among other groups and committees, the PCG); and (ii) controls which involve parties external to the Corporation e.g. the PSC.
- 3.45 While the control systems within the Corporation operate in parallel to the controls external to the Corporation, as shown in Appendix 5, there is considerable direct reporting between these two control mechanisms. Further details of the functions of these control mechanisms and their interaction are described below.

Project Supervision Committee

- 3.46 Pursuant to the Entrustment Agreement, Government has established a committee, the PSC, which holds monthly meetings to review progress under the Entrustment Agreement and to monitor procurement activities, post-tender award cost control and resolution

of contractual claims, in accordance with its terms of reference. The PSC is chaired by the DHy.

- 3.47 Unless otherwise agreed between Government and the Corporation, the Corporation is required to nominate representatives to attend all meetings of the PSC and such representatives must provide information, co-operation and assistance as, in each case, Government may reasonably require. Government is also entitled to receive any papers which are prepared for consideration at the meetings of the PSC.
- 3.48 The composition of the PSC includes representatives from the HyD, THB and Corporation. Representatives from other Government departments may be invited to attend relevant PSC meetings as required.

Project Co-ordination Meetings

- 3.49 An officer at Assistant Director level of the HyD holds monthly PCMs with the General Managers and Project Managers of the Corporation to monitor activities for the delivery of the Project including, but not limited to, timely completion of land matters, resolution of third party requests, key issues on the design, construction, environmental matters that may have potential impact on the progress and programme of the Project as well as interfacing issues with other projects.

Contract Review Meetings

- 3.50 Furthermore, a Chief Engineer holds monthly CRMs with site supervision staff of the Corporation for major civil and E&M works. In case of delays encountered by any contractors, the Corporation would report measures being considered to mitigate such delays.

Government access to the PCG

- 3.51 As explained above, nominated representatives from the HyD regularly attend the Corporation's internal PCG meetings and take part in the approval process of any contracts, tenders and other issues considered.

The M&V Consultant: monitoring and verification

- 3.52 The Project is the first government-owned railway project implemented under the concession approach. The HyD commissioned Lloyd's to review and develop appropriate arrangements for entrusting the Corporation to implement the Project. Lloyd's recommended Government to adopt the monitoring and verification role in the design and construction of the XRL and to perform the "check the checker" role instead of Project manager.
- 3.53 Lloyd's also advised that Government's resources could be utilised more effectively to avoid repetition of work and micro-management of the Project. Lloyd's recommendations formed the framework of the monitoring system for the delivery of the Project. Government appointed Jacobs China Limited as the M&V Consultant for the Project to ensure that the Corporation's obligations stated in the Entrustment Agreement have been fulfilled. The M&V Consultant provided advice on proposals and follows up with the Corporation. If the HyD has any queries on the effectiveness of the proposals, the HyD would request the Corporation to provide additional information to justify the proposals or raise objections to the proposals.
- 3.54 The M&V Consultant, among other things, has carried out the following functions:
- (A) regular site visits to major XRL contracts and site meetings with site supervisory staff of the Corporation (once a month) to inspect progress of various contracts, and comment on any potential construction risks and areas of concerns.
 - (B) attendance at monthly Contract Review Meetings with site supervisory staff of the Corporation. The M&V Consultant enquires about the latest situation on the works in the meetings, and discusses issues which may have potential impact on the progress and programme of the Project including delay mitigation and recovery measures.

Government access to papers

- 3.55 Through participation in the PSC, PCG, PCM and CRM, members of Government from the HyD, RDO and/or THB have been given full access to the documents that are circulated and discussed at these meetings including monthly progress reports, relevant presentations

materials prepared by the Projects Division and relevant documents relating to other matters discussed at the meetings.

Informal communication between the Corporation's and Government's technical staff

3.56 Based on the interviews carried out by the IBC, it is the IBC's understanding that there were numerous regular informal discussions that took place between members of the Projects Division of the Corporation and engineers within the RDO. For example, engineers in the Corporation regularly provided email updates of the Project programme revisions to engineers within the RDO.

Government reporting to LegCo

3.57 Government regularly reports to LegCo at the meetings of the RSC where updates on the Project are provided. These updates are usually provided by the STH. Representatives from other Government departments may also attend as required.

Part IV – Project history

XRL contract award

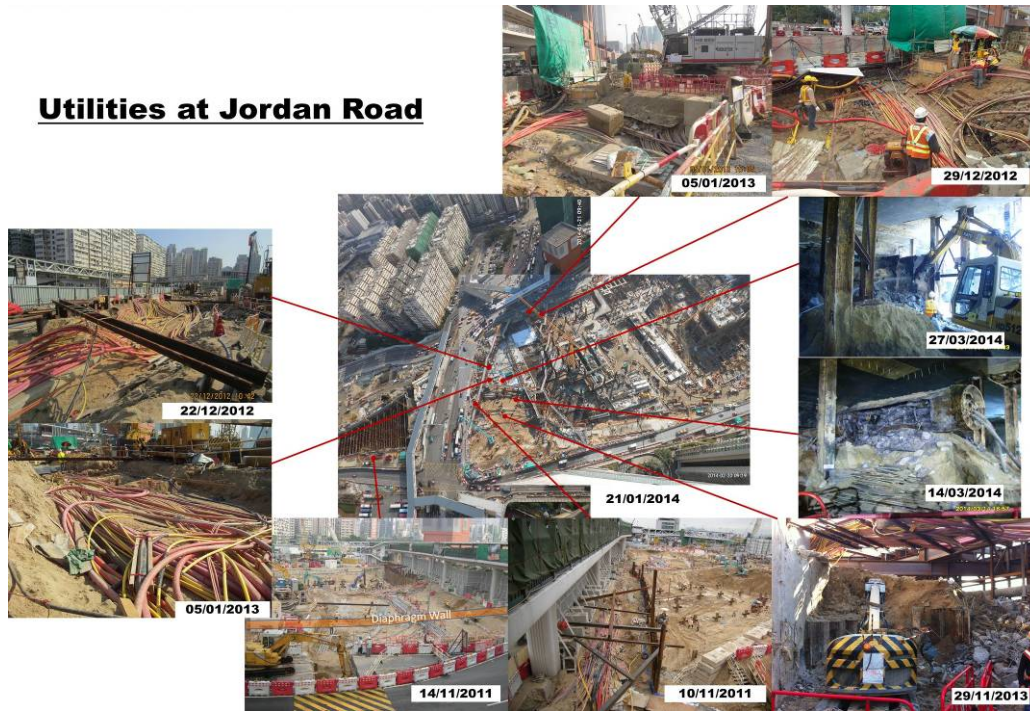
- 4.1 The REL was one of the railway projects recommended for implementation in the Railway Development Strategy 2000, a planning framework undertaken by Government for further expansion of Hong Kong's railway network. Later, the REL became the ERL being pursued jointly between Hong Kong and the Mainland. In the middle of 2005, KCRC submitted a study report on the Shared Corridor Option together with a proposal for the NOL. The report also included a Dedicated Corridor Option in which the ERL services would be operating along a completely new rail corridor within Hong Kong.
- 4.2 In February 2006, the then Environmental, Transport, and Works Bureau asked KCRC to proceed with further planning of the NOL and Hong Kong section of the ERL as a combined project under the Shared Corridor Option. In the light of the rail merger discussion held at that time, a joint study team was formed by the Corporation and KCRC to progress the study.
- 4.3 Subsequently, there were changes in the Mainland's planning parameters significantly affecting the planning of the Hong Kong section of the ERL, in particular on the choice of corridor options. KCRC submitted to Government in the middle of 2007 a project proposal on the Hong Kong section of the ERL on the basis of the Dedicated Corridor Option. The proposed NOL was de-linked from the Hong Kong section of the ERL.
- 4.4 Following the rail merger on *2 December 2007*, the Corporation took over the planning of the ERL and changed the acronym for the Express Rail Link to XRL instead of ERL, to avoid duplication with the use of the acronym "ERL" in the existing East Rail Line.
- 4.5 On *22 April 2008*, the Chief Executive decided that the Corporation should be asked to proceed with the further planning and design of the Hong Kong section of the XRL on the basis that the Corporation would be invited to undertake the operation of the Hong Kong section of the XRL under the concession approach.
- 4.6 On *24 November 2008*, Government entered into an entrustment agreement with the Corporation for the design and site investigation of the Project.

- 4.7 The Project programme presented at the January 2009 Board meeting of the Corporation indicated that the XRL trial run would be complete by August 2015.
- 4.8 On *20 October 2009*, the Chief Executive decided that the Corporation should be asked to proceed with the construction, testing and commissioning of the Hong Kong section of the XRL on the understanding that the Corporation would be invited to undertake the operation of the Hong Kong section of the XRL under the concession approach. On *16 January 2010*, the Finance Committee of LegCo approved the funding for the construction of the railway (HK\$55.0175 billion) and non-railway works (HK\$11.8 billion) of the XRL, amounting to a total of HK\$66.8 billion.

WKT site investigations 2008 to 2010

- 4.9 The IBC is aware that questions have been raised regarding the quality of site investigations performed prior to civil works commencing at WKT, and whether, if site investigations had been more comprehensive, some of the issues now causing delays to the Project could have been mitigated. The following section describes certain site investigations undertaken prior to the commencement of the civil works programme at WKT and is based on technical information provided to the IBC by the PjD.
- 4.10 Site investigation work at the WKT work site was carried out in phases between 2008 and 2010. Before and after site possession, the Corporation obtained information from over 600 drill holes covering all areas of the work site, with the exception of the former Jordan Road area. The drill holes used in that process were spaced on average 14.4m apart. This is in line with the relevant Government guidelines, and is also closer than the industry norm. However, due to the vertical formations of the bedrock at this site, even with closely spaced bore holes, it was possible to miss weak seams of rock or sub-surface boulders.
- 4.11 At the location of the former City Golf Club, prior to the Corporation taking possession of the premises, site investigation work was carried out at the pedestrian footpath and car parking areas of the Club. After taking possession, full site investigation work was conducted in the remaining areas of the Club. Some concerns have been noted regarding the volume of granite found within the WKT work site. The IBC understands that the volume of fresh bedrock that has yet to be excavated in the WKT north area is a known factor based on the

Utilities at Jordan Road



site investigation work. It is not expected that excavation work will be particularly challenging technically but time is required simply to excavate the volume of rock present.

- 4.12 Due to the heavy daily volume of traffic using the eight-lane Jordan Road, road closure for site investigation had not been pursued so as not to cause major traffic blockage. The ground condition under Jordan Road was not adequately documented until the road was moved from its original location after construction had started. It is for this reason that the ground conditions and extensive utilities (and how closely laid and intertwined these utilities were) under the Jordan Road could not be mapped prior to construction work commencing.

XRL construction programme 2010 to 2012

- 4.13 On *26 January 2010*, Government and the Corporation entered into the Entrustment Agreement for construction, testing and commissioning of the XRL. As part of the Project, approximately 20 major (i.e. contract value exceeding HK\$50 million) civil contracts and 20 major E&M contracts were awarded.
- 4.14 The construction phase of the Project began in late January 2010. At the second PSC meeting, held on *28 April 2010*, it was reported that the tunnel and E&M detailed design were on schedule, the piling and diaphragm wall works at WKT were gaining momentum and there was only a minor delay in civil works design and preparation of

tender documents. The XRL progress report presented at the April 2010 Board meeting indicated that the XRL would be ready for service in 2015, with an Estimated Handover Date of August 2015.

- 4.15 The Corporation reported one of the first possible Project delays to Government in May 2010 advising that the Mainland section of the cross-boundary tunnel would likely suffer a delay of approximately six months; however, mitigation measures were discussed with the Shenzhen authorities in order to ensure the commissioning of the Mainland section by mid-2015. In June 2010, Government reported to the RSC that the progress of tunnel works on the XRL in general was satisfactory without major difficulty, the foundation works of WKT were progressing on schedule and the detailed design of the terminus building was being finalised.
- 4.16 Since early on in the Project, however, specific work streams started to experience certain delays – namely, the tunnel works, construction of the cross-boundary section, the removal and re-provisioning of the Nam Cheong Property Foundation under contract 802 and the WKT approach tunnels as well as issues associated with the WKT station itself. These delays were reported to Government and the Corporation undertook certain mitigation measures. From 2010 to 2012, there was no change made to the planned opening date of August 2015. For example, the progress update given in the April 2012 Board meeting showed the XRL opening for service still in August 2015.
- 4.17 On *18 July 2012*, the CEO issued a letter to the STH, noting that the Corporation maintained its target to complete all works to enable the successful opening of the XRL in 2015 as planned, despite certain challenges, including completion of the connecting tunnels with the Shenzhen side, which, as of *18 July 2012*, was six months behind schedule.
- 4.18 By the end of 2012, WKT was experiencing considerable delays to its civil works, and there were delays to the tunnelling works in the Mainland section, which affected the progress of the Hong Kong section.

Increasing delays and Partial Opening: January to July 2013

- 4.19 At the PSC meeting on *25 January 2013*, the Corporation confirmed that as at the end of December 2012 overall physical progress on the XRL was 31.4% complete (against 46.1% planned). The DHy

enquired when the Corporation could advise on the overall Project master programme as well as DRMs planned for WKT, to which the Corporation responded that it was working on a presentation for the matter. However, the Corporation advised Government that slippage in the programme for excavating the WKT site should be caught up by mid-2013 and that it 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 in order to complete the works in 2015.

- 4.20 During his presentation on progress on all the Corporation's projects in the *5 February 2013* Audit Committee Meeting, the PjD noted that there were "*critical*" delays with the WKT construction and significant delays with the tunnelling works as well. However, he confirmed that good progress was still being made despite the challenges faced and discussed DRM initiatives.
- 4.21 Subsequently at the Board meeting on *7 March 2013*, the PjD confirmed to the Board that all projects were on target from both a cost and time perspective.
- 4.22 A similar commitment to the August 2015 goal was expressed in the PSC 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 PSC meeting the Corporation was reporting actual progress on the Project as 34.3% complete against 51.9% under the original programme.
- 4.23 One of the first internal suggestions to revise the opening date of the XRL was made by the Chief Programming Manager of the Project in an email (dated *27 March 2013*) to the PjD. In his email, the Chief Programming Manager urged that the completion date for the whole of the works be revised to the end of September 2015 with a revised XRL opening date of December 2015.
- 4.24 At the ExCom meeting on *11 April 2013*, the PjD gave a presentation on Project progress and its budget position. Members noted the presentations and agreed for the same to be presented at the April Board meeting.
- 4.25 At the Board meeting on *15 April 2013*, while slippages were acknowledged, there was no suggestion that the XRL would not open in 2015.

- 4.26 On *17 April 2013*, a workshop was held by the PjT with the contractor for contract 810A in WKT to analyse progress and measures to recover delays. In that meeting, the contractor put forward a revised construction completion date of June 2016 for the whole of the works. This revised completion date in 2016 was rejected, however, by the PjD, and the contractor was asked to work with the Project site team to identify solutions for achieving the original target opening of the XRL in 2015.
- 4.27 Whilst the PjT had first begun to consider a partial opening plan in March 2013 due to delays already experienced with the WKT contracts, it was after this meeting with the contractor for 810A that a Partial Opening scenario was worked on in earnest. This Partial Opening plan, which the PjT worked on throughout April to June 2013, assumed that only six long-haul tracks would be operational in WKT at Day 1 (as opposed to the originally proposed 10) with the tunnels fully operational. It was formulated and proposed as a solution for achieving the opening of the XRL in 2015 on a reduced project scope. Under the Partial Opening model, some external works (e.g. footbridges and subways) and the WKT roof structure would not be complete by the end of 2015, but it was thought that this would not affect the operation of passenger services.
- 4.28 The existence of the Partial Opening plan was largely confined to the PjT until it was revealed to the ExCom in a presentation in July 2013 (discussed later in this Part IV).
- 4.29 At the Board meeting on *25 April 2013*, the PjD reported that, despite some slippages in the programme (including delays in the WKT excavation work), all projects remained generally on target and, from a budget perspective, contingency balances were generally appropriate.
- 4.30 At the PSC meeting on *26 April 2013*, the Chairman of the PSC indicated that if there was a delay to the opening of the XRL, the HyD should be informed as soon as possible. The Corporation advised that a presentation on the revised programme for WKT would be given to the HyD in July. At that meeting, the Chairman also noted that due consideration should be given to striking a proper balance between the potential prolongation cost and the acceleration cost and that the justification for either approach would have to be substantiated.

- 4.31 By *30 April 2013*, actual against planned progress of the Project was reported by the Corporation to the PSC as 37.56% against 53.87%, respectively.
- 4.32 Rumours of a possible delay in the opening of the XRL leaked to the press in early May 2013 resulting in adverse press coverage. Government responded to the media based on information supplied by the Corporation that the XRL's opening remained scheduled for 2015.
- 4.33 On *23 May 2013*, a meeting was convened between the THB, DHy and Corporation to further review the latest position of the Project including the paper to be presented by Government to the RSC the following day.
- 4.34 On *24 May 2013*, Government submitted its sixth half-yearly report to the RSC at its meeting that day. The THB explained that delays such as those experienced in the Project programme were not uncommon and that the Corporation was exploring ways to catch up so that the completion date of 2015 would not be affected.
- 4.35 At the PSC meeting on *30 May 2013*, the Chairman of the PSC stated that if delays rendered the current target completion date for the Project unachievable, he should be informed as early as possible. The Corporation confirmed that it would do so and said that it would continue to keep monitoring the situation closely.
- 4.36 As regards the development of the Partial Opening plan, on *7 June 2013*, a presentation was made by the PjT to the PjD regarding the feasibility of the Partial Opening proposal. The general internal belief within the Corporation was that it would be possible to achieve an opening date of 2015 on a Partial Opening basis.
- 4.37 Following on from its work commenced at the end of March 2013, on *20 June*, the Corporation's Projects Programme team produced a SRA, based on data as of end April 2013, in which it was shown that opening of the XRL in 2015 could be achieved based on a Partial Opening model. Without the Partial Opening approach, the entire Project would not be expected to complete until September 2016.
- 4.38 At the *28 June 2013* PSC meeting, the Corporation reaffirmed its decision to implement a series of short and medium term mitigation measures to catch up the programme. At that meeting, progress on the Project as at the end of May 2013 was reported as 39.7%

complete against 61.8% under the original programme (an overall delay of six to seven months).

- 4.39 At the end of June 2013, the Corporation entered into discussions with WKT contractors and E&M experts as to the specifics of what the Partial Opening model would look like.

Developments in the Partial Opening proposal: July to 20 November 2013

- 4.40 At the beginning of July 2013, the Corporation commenced regular DRM meetings with the 810A contractor.
- 4.41 On Saturday *13 July 2013*, the July Presentation was given by the PjT to the CEO, DCEO, and FD, where it was reported that the Project completion cost was estimated to be HK\$65.1 billion and that a 2015 opening could be achieved but on the Partial Opening model. The July Presentation proposed that the target opening would be not August 2015 but December 2015, and a request was made to confirm this change of completion date.
- 4.42 The focus at the meeting on *13 July* was, the IBC understands, on achieving the Project goals that had been agreed with Government. The progress of the tunnelling sections was discussed, in relation to which the PjT indicated that excavation would be 100% complete by September 2014 and that all sections would be handed over to E&M works by March 2015. The PjT also indicated that the trains would be delivered by December 2014 and the stabling yards would be ready. All of this was consistent with the start of passenger operations at the end of 2015.
- 4.43 In relation to WKT, however, the PjT described significant delays in some of the works. The PjT spoke about DRMs and how they were prioritising critical plant rooms and track access for Day-1 operations. Day-1 operations would include six long-haul tracks in the centre of WKT, railway facilities and station entrances, CIQ and Government areas, the taxi lay-by, the Public Transport Interchange and pedestrian connections to Kowloon Station and Austin Station at ground level. The PjT had informally begun to refer to the changes to the individual components of the Project that would still achieve the overall goal as MOR. However, at this stage MOR was described in just one slide in an approximately 20 slide presentation pack showing how works could be prioritised.

- 4.44 The attraction of Partial Opening to those presenting it from the PjT, and to those members of the ExCom to whom it was proposed, was that it allowed the Corporation to provide a passenger service that would still be able to meet the Day-1 Operational Requirements that had been agreed with Government. As described above, it had long been agreed (since at least 2010) that only 10 of the 15 tracks would be completed for Day-1 Operations, with additional tracks being built later (post 2021, depending on actual patronage of the railway).
- 4.45 The IBC understands that the OD had confirmed that a six track operation would still be acceptable to meet the train service requirements and patronage forecast¹. There would, however, still be ongoing works after the start of passenger services, including parts of the facility and non-essential works such as footbridges.
- 4.46 The PjD's presentation also highlighted the shortage of labour as one of the key challenges affecting the Corporation's ability to meet the Project programme.
- 4.47 At a briefing to the THB on construction progress given on *23 July 2013*, the Corporation advised Government that the target for revenue service of the XRL would be December 2015. The THB reminded the Corporation to use its best endeavours to deliver the Project on time and within budget.
- 4.48 At the ExCom meeting on *25 July 2013*, the PjD highlighted that, under the Project Cost Report for June 2013, the Project exceeded its budget projection at the relevant time. He mentioned that an update on the Project would be given to the ExCom in August, followed by a paper to the RDO. The DCEO was in the chair for this meeting (in the CEO's absence). No reference appears to have been made at this meeting to Partial Opening or the meeting on *13 July*.
- 4.49 At the ExCom meeting the following week on *31 July 2013* (chaired by the DCEO in the CEO's absence), the PjD reported that the shortage of workers remained a serious concern for the Corporation's various ongoing projects and that the Project continued to experience challenges, but so far its costs had stayed within budget and the

¹ The six long-haul tracks would be completed first, so, in the view of the PjT, there would be no difficulty in running long-haul and short-haul trains from the same set of tracks.

target opening date should still be met. The apparent contradiction between this report regarding budget projection and the PjD's report the previous week appears not to have been commented upon.

- 4.50 At the Audit Committee meeting on *14 August 2013* the PjD reported that the Project was on time and on budget although there would still be multiple challenges to overcome and DRMs to be undertaken.
- 4.51 It appears that Government was first formally notified about the Partial Opening plan on *20 August 2013*, when the Corporation proposed to the RDO and the HyD the partial opening of the XRL (under the Partial Opening model) by the end of 2015 with six long-haul platforms in service. The remaining external works would be completed in mid-2016.
- 4.52 In his presentation to the Board meeting on *22 August 2013*, the PjD said that he believed that there was a programme in place to complete the key elements of the Project for opening in 2015 and within the budget set, although some non-essential works may have to be completed at a later date. He explained that various measures had also been adopted to control costs and manage the programme, including: awarding contracts on a fixed price basis and ensuring that all contracts had on average 80% of their labour requirements. There was, however, no mention of Partial Opening by the PjD or any other of those who was present at this Board meeting and had been at the *13 July* meeting.
- 4.53 At the same meeting one of the independent non-executive directors² stressed the importance of good project management so that any issues could be identified and reported to Government at the right opportunity, especially in light of the fact that any additional funding would require LegCo approval. There appears to have been no reaction to this observation by the PjD or anyone else present at the meeting who was at the *13 July 2013* meeting.
- 4.54 At the *29 August 2013* PSC meeting, the Chairman expressed concerns about the difference between the actual progress and

² Mr. Abraham Shek

planned progress of the Project, especially the progress of the WKT works.

- 4.55 At an ExCom meeting on the same day, the General Manager-XRL Tunnels presented a report headed “Projects Progress Reports for July 2013”. In that report it was stated that labour shortages were an issue common to all five of the Corporation’s on-going projects. On average there was a 20% shortfall across all contracts.
- 4.56 On *13 September 2013*, a presentation (the content of which was again largely the same as the July Presentation) was given by the Chief Programming Engineer to the DHy and the RDO, putting forward the Partial Opening model in greater detail with the XRL opening date set at December 2015. The RDO was very concerned about the incomplete works under the Partial Opening model, but the Corporation did not receive any explicit objection. The HyD, without indicating agreement to the Partial Opening proposal, requested that the Corporation provide further information such that a report could be made to the THB.
- 4.57 Notwithstanding the PjD’s commitment at the ExCom meeting on *25 July* to update the ExCom on the Project in August, it was in fact on *19 September 2013* that the PjT made a presentation to the ExCom (chaired by the DCEO rather than the CEO, who was away) on the Project programme and projected outturn cost. The presentation included a description of the Partial Opening model including reference to a target opening date in December 2015 with cost estimated at HK\$65.1 billion. The same slides were used to summarise the programme status and key challenges as had been shown to Government on *13 September 2013*.
- 4.58 In their presentation, the PjT explained that there were irrecoverable delays in contracts 810A, 810B and 811B which would prevent completion of works in May 2015 as originally planned. Opening on a Partial Opening basis would be achievable by December 2015. The programme progress and timelines were based on the assumption that key challenges identified would be mitigated with improved productivity and efficiency. In the absence of an improvement in productivity, the PjT warned that further delays would be expected.
- 4.59 The Corporation’s Corporate Relations Department was asked at the meeting, as preparatory work, to look into the “*line to take*” taking into account the latest status of the Project and briefing provided by

the PjT. This item does not appear to have been logged on the register of matters arising and followed up on by the DCEO in subsequent meetings (or elsewhere).

- 4.60 During this period of July to October 2013, the delays in the Project became steadily worse. In an email exchange between the PjD and the Chief Programming Manager on *11 October 2013*, the PjD stated his concern that the opening of the XRL by the end of 2015 was reaching a point of “*near impossibility*”. The PjD met the CEO that same day for one of their regular monthly meetings, but made no mention to the CEO of a similar concern about the effect of delays.
- 4.61 The IBC understands that on *22 October 2013* the HyD reported to the STH that there were delays in the cross-boundary tunnelling works and that the Corporation had proposed a Partial Opening plan to achieve Day-1 opening in 2015 using six tracks by end-2015 and 10 tracks by mid-2016. It was also explained to the STH that WKT and the cross-boundary tunnel section were on the critical path of the Project and any further delays at either of these might affect the target commissioning date of the Project. In view of these latest developments, the THB requested the Corporation and the HyD to provide a detailed briefing on the latest progress of the Project.
- 4.62 When presenting his Project Progress Report for September 2013 at the ExCom meeting on *24 October 2013*, it was highlighted by the PjD that, in relation to the Project, critical delays were occurring in contracts 810A, 810B, 811B and the Mainland section. According to the latest forecast, the first TBM from the Mainland side of the boundary would only reach the boundary at Shenzhen by the end of November, which had a significant impact on the overall timetable for completing the Project by 2015. It was also noted by the PjD that the THB had been made aware of the delay and that a further briefing would be given to the THB to brief them on the latest progress. On the WKT recovery plan, it was reported that there were still issues due to unforeseen complications.
- 4.63 The Corporation had begun discussions with the WKT contractors and the E&M experts in relation to what Partial Opening would contain at the end of July 2013. Between July and October 2013, the Corporation’s on-site team (together with the E&M team) had been working to ascertain what the critical parts of the WKT construction programme were in order to decide what Partial Opening may or may not contain. It was in October that the Corporation gave the contractors the E&M mark-ups and a set of drawings which showed

which footbridges and other facilities were needed for Day-1 opening on a Partial Opening basis. The contractors were asked to come up with a plan to deliver on that basis. The contractors delivered that proposal informally on *19 February 2014* and formally on *31 March 2014* (see below).

- 4.64 At the PSC meeting on *29 October 2013*, it was reported by the Corporation that the difference between actual and planned progress on the Project as at the end of September had reached approximately 25%. The Corporation reported that there was an overall delay in the Project of about nine months in general and an 11-month delay in the cross-boundary tunnelling works. The Chairman of the PSC also expressed a concern at the meeting that the forecast expenditure for the remaining months of the 2013/2014 financial year was still low, suggesting no improvement in progress of the Project works.
- 4.65 During October the Projects Programme team had updated the SRA which they had first produced in June. This showed the situation at 826 was deteriorating and would not meet the December 2015 deadline for opening (with Partial Opening) because the Mainland section was three months late reaching Hong Kong. The SRA also showed that the situation at 810A had deteriorated significantly since March 2013.
- 4.66 On *7 November*, the PjD wrote to the General Managers in the PjT: *“The figures and achievement by each contract remain a serious concern. I am sure you have a plan or a DRM or two to secure the recovery to what we have committed in July to CEO of our Minimum Operating Requirement for Day-1 operation by December 2015. If we are now in serious doubt about this commitment, I want to be sure that we have a plan to first inform of Board and Executive ASAP...”*
- 4.67 On *8 November 2013*, the PjD and other representatives from the Corporation met with the PST and the DST, as well as the DHy and the RDO. The delays experienced in relation to contract 826 were discussed in detail. The completion of the tunnelling, track and E&M works for dynamic testing at 826 was projected for late 2015 which, together with nine months testing, would push the opening date for the Project into early 2016 (assuming no DRMs).
- 4.68 The PjT also gave another presentation on Partial Opening at this meeting. This presentation was substantially similar to the July Presentation and the *13 September 2013* presentation (without any update relating to contractual work done since April). During this

presentation, the PjT gave more detail about Partial Opening, in particular the readiness of WKT for opening in December 2015, and the facilities that would have been constructed or may still be under construction at the proposed December 2015 opening date.

- 4.69 The THB raised the concern that if the testing of the XRL could only commence in October 2015, it was unlikely that the XRL would start operations by the end of 2015. If that was the case, Government felt that the public should be informed as soon as possible, including LegCo at the forthcoming RSC meeting on 22 November 2013.
- 4.70 The THB's concerns about the programme for opening and what to report to LegCo appear not to have been communicated outside the PjT at this time.
- 4.71 By 11 November, the PjD appears to have become increasingly concerned: "*Further to my email [of 7 November as referred to above], I have had a number occasions trying to come to some clearer understanding with all the progress and challenges associated with XRL [sic]. But I have totally failed. We have presented to our CEO and Executives in July indicating that we can make December 2015. A similar presentation was given to Perm Sec (Transport) last Friday. As you know, many of our planned target and production rate have failed to materialise and if anything, the pressure on our cost/contingency is increasing...*".
- 4.72 On 14 November 2013, a memorandum from the Chief Programming Manager to the PjD confirmed that the programme would be delayed likely to until about April to May 2016, even operating on a Partial Opening basis. In his cover email, the Chief Programming Manager stated: "*We need a major turnaround of events on 810A to Open to Public MOR in mid 2016 and complete all external works within a 2016 timeframe.*"
- 4.73 On 19 November 2013, the Projects Programme team produced a second SRA on the tunnel programme. This SRA contained the October 2013 update to the first SRA and had been updated to November. The SRA showed further slippages to the northern tunnel contract areas. Contracts 826 and 810A were seen as critical.
- 4.74 The STH was briefed by the HyD on 20 November 2013 about the possibility that the XRL might only commence passenger operations after 2015 due to the delays in the cross-boundary tunnelling.

- 4.75 Based on the assessment of works progress given by the Corporation on *8 November*, and following the briefing to the STH on *20 November*, the THB contemplated making the potential delays public at the RSC meeting scheduled for *22 November 2013*. The THB apparently proposed to explain that the XRL might only commence operation after 2015 and the latest construction progress and the actual challenges encountered.
- 4.76 At no time, however, was the July Presentation or the changes proposed under the Partial Opening plan presented to or discussed with the full Board. It has been explained to the IBC by members of the ExCom who have been interviewed that it was rare for project adjustments (which was apparently how the ExCom viewed the Partial Opening plan) to go to the full Board unless the changes were material.
- 4.77 Each of the ExCom members interviewed by the IBC accepts that with the benefit of hindsight, the changes proposed under the Partial Opening plan should have gone to the Board. It has been suggested variously by them that this could have been an outcome of the meeting on *13 July 2013* or more likely the meeting on *19 September 2013* when the full ExCom considered the Partial Opening plan. It was normal practice of the ExCom collectively to consider and decide whether an item should go to the Board, but this appears not to have been the case following the discussion of the Partial Opening plan at the September meeting.

Nearing impossibility: 21 November 2013 to 30 March 2014

- 4.78 When the CEO was told that the THB contemplated making public (at the RSC meeting to be held on *22 November 2013*) the possible delays and that the XRL might only commence operation after 2015, he telephoned the STH to express disagreement with this proposed statement. The CEO explained the Corporation's concern that any announcement would mean leverage that the Corporation previously had to force the contractors to work to the timetable might be lost. The CEO had confirmed at that time with the PjD and the OPD that the railway would be operational before the end of 2015. The OPD confirmed to the CEO that it would be if he had access to the tracks by the end of September 2015. The PjD confirmed the railway would be operational before the end of 2015 based on the Partial Opening plan and, if there was still delay in the cross-boundary tunnelling, it would be possible to finish just one tunnel and operate

with one tunnel on an interim period running trains on a bi-directional basis³.

- 4.79 The STH did not accept the CEO's statements regarding completion in the telephone call and called for an urgent meeting between the Corporation and PST and HyD to clarify the position as Government believed the public must be informed if the railway would not commence operations until after 2015.
- 4.80 Later that day, in the evening, a meeting was held between the THB and the HyD with the CEO, PjD, OPD, General Manager – XRL and the Deputy General Manager - Corporate Relations. During that meeting the THB enquired how the Corporation could remain of the view that the Project would be completed and commissioned in 2015. The Corporation apparently confirmed that it was working hard to identify solutions to meet this target and that at the very least, single track bi-directional operations should be possible in the cross-boundary section of the tunnels. The THB stated that such single track operation did not comply with Government's requirements and was therefore unacceptable.
- 4.81 The THB was concerned that based on the Corporation's information, the Project would only be ready for testing in October 2015 and asked whether the XRL could be commissioned in time within 2015. The THB apparently cautioned the Corporation not to over-state its ability to overcome the challenges. Government needed a realistic assessment and should alert the public immediately if the target was not achievable. The PjD then stated that without the single track option the Corporation would look to recover the delays in other ways (i.e. by bringing in an extra TBM). While he was confident that this could be achieved over the next two years, he stated that the Corporation would be able to give a better view of progress in six months time after the tunnelling works had commenced on the Hong Kong side.

³ The tunnels and signalling systems on XRL are designed to support bi-directional running (i.e. trains running in both directions on the same stretch of track) over relatively short sections of tunnel. These systems are to provide for the event of an incident involving a section of one of the tracks becoming blocked or non-operational. Along the length of the tracks there are regular points of egress to allow trains to cross from one track (tunnel) to the other to avoid non-functioning track sections.

- 4.82 Eventually a consensus was reached that whilst the target of 2015 should be maintained at that stage, Government and the Corporation should be upfront with the challenges faced by the Project when attending the RSC meeting the following day. Meanwhile, Government requested that the Corporation provide it with a clear roadmap on how the 2015 target could be met.
- 4.83 On *22 November 2013*, Government reported at the RSC meeting that construction of the XRL was expected to be completed in 2015 as scheduled, and that it would take generally six to nine months for testing and commissioning (Government did not mention the revised Partial Opening plan to LegCo, explaining later that it never agreed to such an arrangement).
- 4.84 At the PSC meeting held on *29 November 2013*, the Corporation reported that there was an overall delay of nine and a half months to the Project programme, with the WKT works and the works on the cross-boundary section and 823A (Tse Uk Tsuen to Tai Kong Po) tunnels being most critical. In response to questions from Government, the PjT confirmed that the target date for completing all civil works and E&M works by June 2015 to be ready for testing and commissioning was achievable.
- 4.85 The Chairman of the PSC reminded the Corporation at that meeting to ensure that the Project would be delivered within the approved budget. The Chairman also requested that the Corporation especially monitor and improve progress with the works at the 823A tunnels. Picking up the theme from the meeting with the Corporation of the previous week, the HyD meanwhile requested the Corporation to provide a more detailed roadmap for achieving targeted opening in 2015 including critical milestones under individual contracts.
- 4.86 The Corporation agreed to provide the PSC with more details on the proposed opening arrangements for the Project, including the extent of the readiness of the external works at WKT and public areas. The Corporation confirmed that, with respect to the delay to the WKT works, it was exploring mitigation measures for the achievement of Partial Opening. Similarly, measures were being identified to recover the delays to the tunnelling works.
- 4.87 In an email sent on *6 December 2013*, shortly before the PjD was due to meet the Labour Department (with the RDO), the Chief Programming Manager expressed his concerns about labour shortages: “*The major issues remain: (1) Age of workers and hence*

consequential lack of productivity; (2) Lack of frontline supervision; (3) Lack of new blood or continuous inflow of workers to maintain a core of experienced workers; and (4) Lack of skilled workers, general labour used for skilled trades.”

- 4.88 Despite concerns such as this from the PjT, the PjD’s optimism that the Project would be ready to open on a Partial Opening basis by the end of 2015 appears to have been undiminished.
- 4.89 At the Board meeting on *10 December 2013*, the STH mentioned that the actual opening date of the Project would depend on the completion date of the construction works, given the six-month period required for testing and commissioning. The PjD gave his Half Yearly Update of New Railway Projects presentation which included an update on progress of the Project. He made a general statement that project works were managed with necessary mitigations, coupled with recovery plans in case of programme delay.
- 4.90 The Board asked questions surrounding the budget (covering management of claims) and completion was also discussed. In response to a direct question from an independent non-executive director, the PjD confirmed that the Project would be completed by the end of 2015. Again, none of the other members of the ExCom present or anyone else present and with knowledge of the Partial Opening plan challenged or raised a question regarding this statement by the PjD. Another independent non-executive director⁴, on the back of this dialogue, stressed the importance of keeping LegCo informed of developments which could have an impact on the budget for the Project.
- 4.91 However, on *19 December 2013*, the Chief Programming Manager sent an updated SRA report to the General Manager of the Project, copying the PjD stating that WKT could no longer be open within 2015 even on a Partial Opening basis and suggesting that the opening date would be May 2016. By the end of December 2013, the XRL actual progress against planned on the Project was 51.34% vs. 81.41%.

⁴ Mr. Abraham Shek

- 4.92 In the RDO/HyD co-ordination meetings held in January and February 2014, the Corporation maintained that the Project was still targeted for completion in 2015.
- 4.93 On *15 January 2014*, the CEO requested the PjD to provide a comprehensive review of the Project. This was six months after the comprehensive review in July 2013. It was later agreed to take place in mid-April as the PjD felt that he would be better able to update the ExCom with comprehensive information at that time.
- 4.94 At the ExCom meeting on *23 January 2014*, the PjD noted that he would give a briefing on the Project programme and cost position of the Project to the ExCom in mid-April 2014. The CEO reminded him during the meeting of the need to engage the THB at an early stage so as to ensure advance notice in keeping the THB abreast of any developments in the programme.
- 4.95 Similarly at the PSC meeting on *24 January 2014*, when the DHy expressed his continued concerns about the significant programme slippage for the Project, the Corporation said that it would present the latest forecast opening arrangements and commissioning timeframe to the DHy in April 2014.
- 4.96 On *19 February 2014*, the PjT received an informal (and not yet complete) response from the contractor for contract 810A in relation to the Partial Opening proposal which the Corporation had submitted to the contractor in October 2013. The response indicated, albeit on an informal basis, that according to the contractor's calculations, even with the Corporation's proposed Partial Opening, there would be no track access until June 2016.
- 4.97 At the PSC meeting on *28 February 2014* the Corporation informed the PSC that it had been working closely with contractors on measures to catch up with the construction programme.
- 4.98 The M&V Consultant's monthly report for February 2014 indicated their satisfaction that the Corporation was "*taking due cognisance of its obligations in relation to safety, quality, environmental, programme and cost management*", but the report said that the target date was "*looking very challenging*" given accruing delays in contracts 823A and 826. The M&V Consultant also referred to the updated Project programme which it was expecting the Corporation to produce, now in May 2014.

- 4.99 The opening date was further pushed back to mid-2017 in a programme status presentation given by the PjT to the PjD on 7 *March 2014*; the slides in this presentation discussed the overall programme outlook and set January 2017 as the month for completion of railway works and April 2017 for revenue operation.
- 4.100 However, on 18 *March 2014* at the RDO/HyD co-ordination meeting, it was reported (although the minutes do not expressly state by whom) that “*the project is targeted for completion in year 2015*”.
- 4.101 At the ExCom meeting on 27 *March*, the PjD reported that contracts 826, 823A and 810A remained major concerns. A detailed briefing would be given to members of the ExCom on 12 *April 2014*.
- 4.102 Two events at the end of March 2014 appear to have precipitated a fundamental change in the view of the PjT, and the PjD in particular, as to the achievability of the Project opening to passenger services by the end of 2015. The first was the black rain storm on the night of 30 *March*, and its consequences, and the second was a formal presentation by the 810A contractor on 31 *March* regarding progress with and the programme for the WKT construction. These events appear to have brought home forcibly for the PjD and perhaps others on the PjT that a 2015 opening date was simply not possible under a Partial Opening scenario or otherwise.
- 4.103 The events of 30 and 31 *March 2014* are described at paragraphs 4.111 to 4.119 below; however, to put them in context it is helpful first to summarise the status of the Project as at the morning of 30 *March*.

Summary of delay position prior to 30 March 2014

- 4.104 This section of the report summarises the major delays encountered in the Project prior to 30 *March 2014* (the date of the flooding of the tunnel in contract area 823A as described below). The summary is based on information prepared by the PjT and submitted to the IBC. Its technical accuracy has not been independently verified by the IBC⁵.

⁵ The delays described here and elsewhere in this report are described without prejudice to any of the Corporation's legal or contractual rights in respect of the Project.

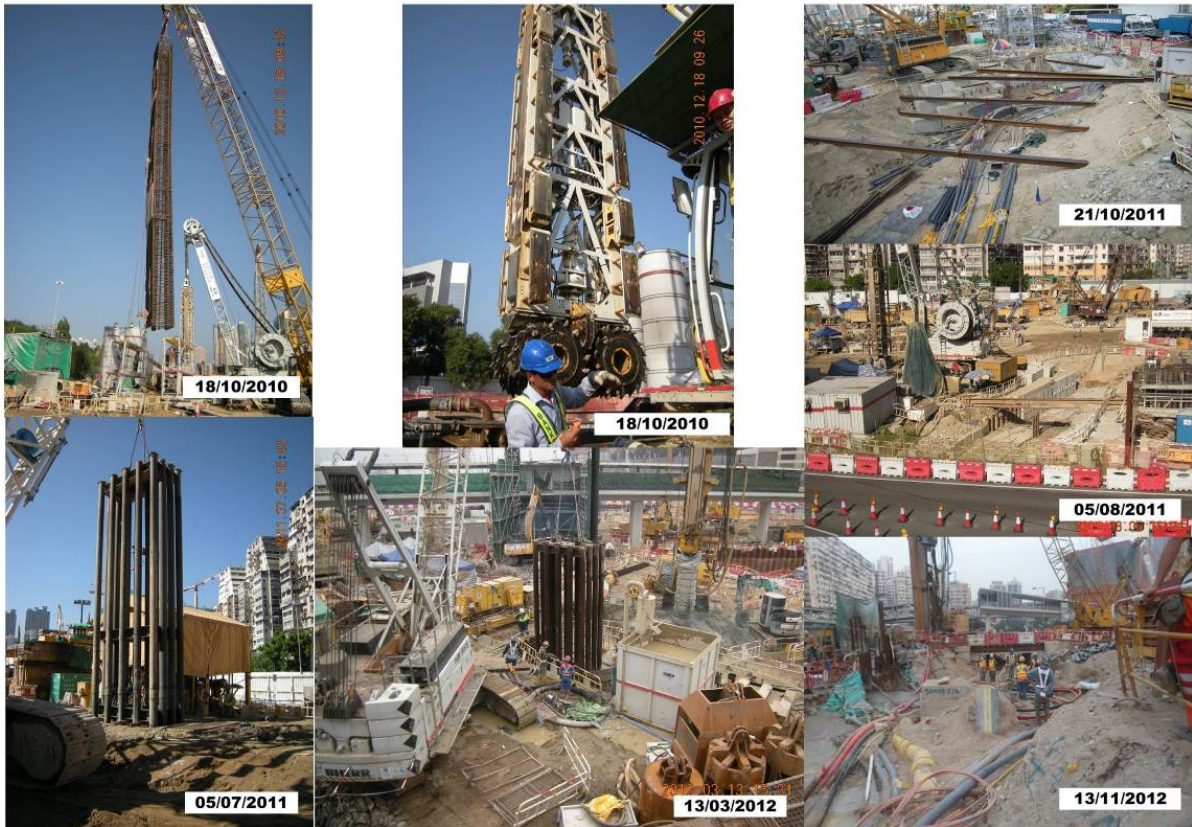
4.105 As at 30 March 2014, there were already significant delays to many of the individual contracts; however, the PjT has identified contracts 810A, 823A and 826 as being the contracts where the delays by that date were already so substantial that they were seen as critical to completion of the Project by the end of 2015.

West Kowloon Terminus

4.106 The four civil construction works contracts for the West Kowloon Terminus, 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 a number of delay events some of which have been critical to the Project programme path:

- (A) the two advanced works 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 facilitate WKCD's latest design. Despite the site investigations that had been performed, unforeseen ground conditions (weak seams, the presence of large cobbles, boulders and artificial obstructions) together with late utility diversions also affected the progress of the works. These caused a knock-on effect to the critical 810A station (north) area, in particular the centre core station structure and the roof, in the order of 11 months;
- (C) in the 811A and 811B approach tunnel area and in particular 811B, significant delays due to late utility diversions, measures to overcome complex utility arrangements and more unforeseen ground conditions (namely higher than anticipated rock levels, weak seams and the presence of large boulders) prolonged the construction of the diaphragm wall in three key areas that were required to be constructed sequentially; to the north of Jordan Road and then within the area bounded by

Diaphragm Wall Rock Removal Equipment around Existing Utilities



Jordan Road after the road had been diverted. These delays had a knock on effect to the 810A station (north) top-down area directly affecting one of the Project's critical paths (leading to track access and testing and commissioning), in the order of 15 months; and

- (D) 810A was further delayed by the issues related to the quality of the steel couplers⁶, unexpected movement of the west diaphragm wall, unforeseen ground conditions, design changes and issues related to the quality of roof steelwork fabrication and the interdependencies between the temporary and permanent structural designs. These latter three issues caused significant delay to the roof construction.

⁶ Couplers are used to couple two steel reinforcement sections before pouring concrete into the structure.

4.107 Throughout the construction of WKT there has been a shortfall of skilled labour and frontline supervision. This together with the inability to achieve planned production rates across the terminus has also contributed to the overall delay.

Tunnel contracts

4.108 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; contract 825 - Ngau Tam Mei to Mai Po Tunnels and contract 826 - Huanggang to Mai Po Tunnels, have been affected by a number of delay events some of which have been critical to the Project programme path:

- (A) all eight tunnel contracts have been affected by unforeseen ground conditions (higher than anticipated rock head levels, high water inflows, presence of cobbles and boulders and the presence of underground steel obstructions, etc). The delay to each contract as a result of unforeseen ground conditions varies up to 12 months;
- (B) the late arrival of both TBMs from the Mainland has 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 critical contracts currently affecting the Project completion;
- (C) even before *30 March 2014*, contract 823A had been delayed by late land possession at Choi Yuen Tsuen, unforeseen ground conditions as mentioned above, breakdown and frequent repairs of both TBMs and an inability to achieve planned production rates; and

- (D) with the exception of contracts 820 and 821, all tunnel contracts have been unable to achieve the overall planned production rates which has been one of the major causes of delay to the Project.

4.109 As with WKT there has also been a significant shortfall of skilled labour and frontline supervision which has contributed to the overall delay.

Tunnel advance works

4.110 The advance works, contract 802 - Nam Cheong Property Foundation Removal and Re-provisioning, have been delayed 21 months by the unforeseen condition of the existing steel H-piles which were severely bent making their removal far more complicated.

Events at contract 823A on 30 March 2014

4.111 On the night of *30 March 2014*, a black rainstorm of exceptional intensity led to serious flooding at the Yuen Long tunnel, causing damage to the TBM at the north down-track tunnel of contract 823A and resulting in tunnel blockage and delay. The source of the flood water was a section of cut-and-cover tunnel about 850m south of the flooded TBM along the tunnel alignment in the adjacent contract 823B. The cut-and-cover tunnel in contract 823B is connected to the contract 823A TBM tunnel.

TBM at contract 823A



Damaged TBM at contract 823A



- 4.112 Even for a black rain storm, the rainfall on the night of *30 March* was exceptionally heavy (one in 200 years). It washed a large amount of debris and fallen vegetation away from the area adjacent to the contract 823B construction site, blocking a surface drainage channel at the top of a temporary cut slope of approximately 4m high, causing the water to spill over to the side of this cut slope. The slope was then eroded causing it to fail partially.
- 4.113 The spoil and debris from the partially failed slope then blocked the temporary drainage inlet of a nearby newly constructed box culvert. As a result, the flood water accumulated at the ground surface, then overflowed and damaged the earth bund (flood) barrier intended to guide the ground surface water away from the section of the cut-and-cover tunnel to prevent it from being flooded. The top part of this section of the cut-and-cover tunnel had been trimmed down to connect to the Shek Kong Plant Building South (SPS) which was under construction at the time.
- 4.114 The overspill water continued to flood into the cut-and-cover tunnel in contract area 823B and then flowed into the connected 823A north down-track tunnel, which has a downward gradient towards the tunnel face, eventually flooding the whole TBM at that location. At their height the floodwaters were as much as 9m deep at the TBM face.
- 4.115 The surface of the failed temporary cut slope in contract area 823B had been protected by a combination of grass seeding and shotcrete. The slope had been in place since 2011 and had performed well in the past under heavy rainfall conditions. The surface drain at the top of the cut slope was a shotcreted channel. A pre "wet season" inspection was carried out and had confirmed that its condition was good.

4.116 To prevent any similar flood happening again, the temporary cut slope was immediately stabilised by placing large concrete blocks at the failed location, and the slope surface was fully shotcreted. Inspections of all other slopes adjacent to the open top section of the cut-and-cover tunnel alignment were also carried out promptly after the incident to ensure that they were all sound and sufficiently robust to prevent possible erosion from heavy rainfall.



Flooded TBM tunnel

4.117 Similar black rain storm conditions have been experienced since the incident on *30 March 2014*. The IBC understands that the flood prevention measures now in place have proven to be effective.

4.118 The IBC understands that the combination of the flooding incident and other delay events on contract 823A mean that overall this contract has been delayed by approximately 18 months.

Delay to 2017 confirmed: 31 March to 16 April 2014

4.119 On 31 March 2014, the 810A contractor gave a presentation to the Corporation in relation to the Partial Opening proposal, showing that access for track laying would not be available in December 2015 and through 2016, and that completion of 810A's scope of work would only take place in 2017. On this basis, the critical path on which Partial Opening had relied to be able to begin passenger services on 2015 was no longer relevant. The PjD indicated that the entire Project completion schedule should be re-assessed ignoring Partial Opening.

4.120 Yet at both the Board meeting on *7 April* and the ExCom meeting on *9 April 2014*, there appears to have been no mention of the XRL or the Project status. The information provided to the PjD at the meeting with the 810A Contractor on *31 March 2014* had not been communicated to the Board or the ExCom.

- 4.121 On *12 April 2014*, the PjT gave a briefing to the ExCom on the latest programme status for the Project and for the first time notified the members of the ExCom that the overall schedule for completion would indeed be delayed to 2017.
- 4.122 In the last comprehensive review, which was conducted on *13 July 2013*, all tunnel excavation was projected to be completed by September 2014 and all sections were projected to achieve Degree-1⁷ completion by March 2015. This included contract 826, where the TBM was arriving from the Mainland.
- 4.123 The April Presentation updated the forecast for the tunnelling contracts. According to the April Presentation, delays were occurring in contract 826 and contract 823A, which was tunnelling from Tai Kong Po to Tse Uk Tsuen. Contract 823A was also by then considered to be more critical.
- 4.124 The PjT explained to the ExCom that as a result of the flooding in 823A in the black rainstorm on *30 March 2014*, the TBM in the north down-tunnel was badly damaged and all tunnelling in that tunnel had stopped. Investigation by the contractor over the previous two weeks since the storm indicated that significant repair work would be required to the mechanical and electronic components of the TBM.
- 4.125 The June 2013 Forecast indicated that the 823A North Up-Track Tunnel excavation would be completed by March 2014. The February 2014 Forecast for the same work (before the flooding incident) indicated that completion would be delayed by 15 months to June 2015. The flooding incident only made this situation worse as it was anticipated that it could take up to nine months to restart the TBM.
- 4.126 Serious delays had also been encountered in WKT. Critical E&M plant rooms had not been handed over to the E&M contractor by the

⁷ Degree-1 completion refers to the handover of station or building areas from civil works to E&M works and tunnels from civil works to trackwork. At Degree-1 completion all civil works (concreting and wet trades like plastering, painting and floor screeding) should effectively be ready for commencement of E&M works or trackwork as relevant. Degree-1 completion will not include work items such as floor tiling, walls and ceilings which are part of the civil scope of works carried out subsequently.

end of 2013 as anticipated and further delays were expected. Similar delays were also affecting the handover of track areas to Permanent Way. Actual progress was well behind what was required to be able to initiate passenger services in December 2015 to meet the Day-1 operating requirement.

4.127 The IBC has been told that it was only at this point that the ExCom (except for the PjD) learned how severe the cumulative effect of the delays to the Project was even before the flooding incident. With the delays that had occurred in the tunnel sections and WKT, it was readily apparent that it would not be possible to initiate service in 2015. Moreover, given the critical areas of contract 810A for WKT completion, and the fact that the 823A tunnel section was now on the critical path, it was no longer feasible to work to a programme to meet the Day-1 operating requirement by December 2015 and finish non-essential works after passenger service had started.

4.128 The programme now proposed by the PjT showed that works could be completed and passenger service initiated by October 2017. The ExCom discussed the basis of that forecast with the PjT. On the one hand, it was certainly preferable to initiate passenger services, if possible, in 2016. That would have been broadly consistent with the response to questions provided by the Under STH at the LegCo meeting in November 2013. On the other hand, the ExCom felt that the Corporation should not commit to a revised schedule that it would not be able to achieve. The thinking was, as explained to the IBC, that explaining delays once would be difficult, but doing it multiple times would be much more problematic.

4.129 During the course of the discussions on *12 April*, the IBC was told that many questions were raised by the members of the ExCom, including:

- (A) whether there were ways to pull the programme forward;
- (B) whether a variation of the Partial Opening plan could be developed to concentrate on critical areas and start passenger services even if all works were not fully completed;
- (C) how confident the PjT was that the damaged TBM in the 823A contract area could be re-started and what would happen if it could not be;

- (D) how the Corporation would assess the assumed rate of production in the tunnel sections and compare that to what had actually been achieved. Similarly, questions were asked about how the Corporation could be confident that contract 823A would achieve the forecast rate of production given the serious delays in that contract even before the flooding incident on *30 March* 2014;
- (E) to what extent the Corporation was at risk for unknown conditions (e.g. marble zone) in the areas where tunnelling remained to be completed and what allowances had been made in the schedule for these risks. The PjT was also asked what steps, if any, could be taken to mitigate the potential risks;
- (F) how confident the Corporation could be of the revised WKT schedule;
- (G) to the extent that the rate of concrete production required for WKT would be higher than what had been achieved on the Project so far, what confidence the PjT had in the contractor's ability to achieve that higher production rate and why;
- (H) to what extent the programme schedule relied on being able to import labour and whether it could be achieved with the labour resources that the contractors already had in place;
- (I) what discussions had taken place with contractors and whether they supported the programme schedule that was being presented to the ExCom that day (recognising that commercial discussions also needed to take place);
- (J) whether the programme was dependent on Government approval of a blasting permit for rock excavation at WKT;
- (K) whether the programme was dependent on Transport Department approval of a road closure for Lin Cheung Road; and
- (L) whether the programme was dependent on approval of a 24-hour Construction Noise Permit.

4.130 At the end of the discussion, the ExCom apparently concluded that it would not be possible to start passenger services in 2016 and that it

was going to be necessary to indicate that the start of passenger services would be delayed to 2017 or later.

- 4.131 In the tunnelling sections, the assumption of a nine month delay to restart the flooded TBM was explained by the PjT to be at the conservative end of the range submitted by the contractor (which had suggested six to nine months). There was some view that this might be shortened if the contractor could cannibalise electronic components from the other TBM in that contract area (in the other tunnel), but this was not assured and was not incorporated into the programme schedule. The PjT also highlighted TBM enhancements that were in progress, which were expected to enhance the production rate of the 823A TBMs. The assumptions for contract 826, meanwhile, allowed for further delay crossing into Hong Kong and for a lower production rate in the marble zone given the unknown conditions in that area.
- 4.132 At WKT, ground conditions were now known and the assumed excavation rate was broadly consistent with what was being achieved at that time. In addition, the concrete production rate was assumed to be 5000m³ per week, which was significantly less than the contract 810A Master Programme. While the rate exceeded the current level of production, the PjT put forth what the ExCom considered to be a sound basis for why that rate should be achievable as the contractor opened up more area in the site and removed equipment that had been impeding concrete production.
- 4.133 The programme as put forth did not assume any imported labour as the political feasibility of that was still unknown. The PjT indicated that the programme was consistent with current labour resources.
- 4.134 The PjT also saw opportunities to advance the schedule, but this depended on Government approvals of a blasting permit for excavation and/or agreement for closure of Lin Cheung Road. While both of these actions were desirable, the PjT confirmed that the schedule was not dependent on Government approvals beyond what had already been agreed. The ExCom agreed that those approvals should be pursued (along with a request for a 24-hour Construction Noise Permit), but that Government approval should not be assumed in the programme schedule.
- 4.135 The ExCom also noted that the programme schedule indicated that passenger service could be initiated in October 2017. From a public communication point of view, the ExCom felt that nevertheless, the

Corporation should say "*end of 2017*", providing a further three month contingency in the programme schedule. The ExCom considered whether it would be better to use 2018 for the start of passenger services, but did not feel that schedule was supportable given that the 2017 start was based on a set of realistic assumptions and generally known conditions. The ExCom also considered whether it was better to leave the completion date open-ended and to say that the Corporation would provide a new completion date at a later time. This was not felt to be the best way to handle the situation as it would leave too much doubt and uncertainty about the Project.

- 4.136 Given the significance of the delay, the members of the ExCom discussed the next steps. The ExCom recognised the public and media interest in the Project and that the delay to the opening date for the Project would likely become a public issue very soon.
- 4.137 The ExCom apparently agreed that it was important to reach out to the Chairman and the STH quickly. The ExCom also discussed the need to reach out to counterparts within the THB and the HyD, particularly the DST and the HyD. No suggestion was made at the *12 April* meeting to call a meeting of the Board.
- 4.138 The CEO called the Chairman and the STH immediately after the XRL Review meeting had concluded. While the CEO was unable to contact either of them straightaway, he did speak with the Chairman and the STH before the end of the day. Both conversations apparently focused on the programme delay and highlighted that passenger services would be delayed to 2017. According to the CEO and the Chairman, there were no discussions about the budget impact as this was not covered in the meeting and Procurement would be conducting a "bottoms up exercise" taking the revised schedule into account. The likely public interest in the delay was also discussed with both the Chairman and the STH, since it was recognised that this might become a public issue very soon.
- 4.139 The Chairman communicated to the CEO his view that the Corporation should go public promptly. The Chairman felt that a full discussion by the PjD would be better than just responding to questions. The CEO relayed the Chairman's thoughts to the PjD and the General Manager - Corporate Relations.
- 4.140 The Chairman subsequently had a telephone conversation with the STH on Sunday, *13 April 2014* and followed up with the CEO later that day. The Chairman stressed to the CEO that he and the STH

agreed that "we" should go public promptly. Both the Chairman and the STH apparently considered time to be of the essence here. There seems to have been no suggestion from any of the three participants in these conversations over that weekend of *12 and 13 April* that a special Board meeting should be called.

- 4.141 Also on *13 April 2014*, the DHy and the RDO/HyD met the PjD and other members of the PjT to discuss progress on the Project, taking into account the DRM for the works in WKT construction and the flooding of the TBM incident under contract 823A. The Corporation told Government that it was still working with the related contractors for a realistic programme to mitigate the current delay and would inform the DHy accordingly. There appears to have been no mention by the PjD of his presentation the day before to the ExCom.
- 4.142 The ExCom met on the Monday morning (*14 April 2014*). The CEO updated the ExCom on his conversations with the Chairman and the STH and also on the Chairman's view that the Corporation should communicate the delay to the public promptly. The PjD updated the ExCom on his meeting with the HyD and the RDO. The ExCom discussed the Chairman's suggestion to go out proactively. At that point, the ExCom decided that it would be better to wait and planned to update the Board at the scheduled meeting on *29 April 2014*.
- 4.143 The Chairman, CEO and PjD met the STH and transport officials on the evening of *14 April*. According to the attendees at that meeting from the Corporation, there was a strong push during the meeting to go public promptly. The Corporation attendees left the meeting with the view that the Corporation would go public the next day.
- 4.144 During the evening of *14 April* and into the early hours of *15 April*, the Corporation's Corporate Relations Department had begun work on preparing a draft press statement, Q&As and a script for the members of the PjT due to attend the anticipated press briefing on *15 April*.
- 4.145 The CEO had several conversations with the STH on the Tuesday morning (*15 April 2014*). The STH indicated that he wanted to go out first to announce that the Project would be delayed. He planned to do that after the Executive Council meeting that morning. The CEO suggested as an alternative that the STH and he should appear together before the media. The STH declined the CEO's suggestion and indicated that he would announce the delay to the press in the

early afternoon but defer details to the Corporation's press briefing, which was due to take place later that day at 5:00 p.m.

4.146 The CEO also had several conversations with the Chairman on that Tuesday. The Chairman took account of the CEO's discussions with the STH and understood that the Corporation would arrange a press briefing in the afternoon. None of those involved in these conversations on *14 and 15 April* raised a question of whether there should be a Board meeting or any communication with the Board.

4.147 In his briefing to the media at 2:30 p.m., the STH conveyed his surprise and disappointment regarding the progress of the Project.

4.148 There had apparently been some earlier discussion between members of the ExCom as to who should appear for the Corporation at its press briefing later that afternoon. The CEO discussed the question of attendees with the General Manager - Corporate Relations and whether he should lead the press briefing. However, the view reached was that the delay was an operational matter and therefore should be presented by the member of the executive directorate and team responsible for that operational area, in this case the PjD and the PjT. It was also anticipated that the presentation to the media would principally be technical, a description of the reasons for delay, and that therefore members of the PjT were best placed to present and answer media enquiries. Accordingly it was the PjD and members of the PjT who led the press briefing on the afternoon of *15 April 2014* to announce the delay to the completion of the Project.

4.149 The IBC has been informed that this decision that the PjD should lead the press briefing was consistent with the Corporation's approach to media briefings regarding operational matters where it will usually be the relevant operational department that takes responsibility for the briefing. As a result, the CEO was apparently advised, and accepted, that there was no need for him to lead or attend the press briefing that afternoon.

4.150 A press statement was also released to accompany the media briefing. Entitled 'Revised Programme for Hong Kong Section of Express Rail Link Project', it was just over one page long and attempted to summarise the reasons for the delay. The content of the press statement had been quite closely discussed within the ExCom over *14 and 15 April*. The press statement was drafted initially by the General Manager - Corporate Relations, and it was circulated for review to the senior members of the PjT, PjD, CEO, certain other

members of the ExCom and Chairman for their comment and approval. The Chairman also approved the press statement before it was released on *15 April*.

4.151 The IBC understands that in relation to the Project it is the usual custom of the Corporation to send any press statements to Government for comment before they are released. The IBC also understands that the Corporation usually expects to receive some comments from Government before the statements are released. Two draft versions of the press statement were sent to Government for comment, the first at about 3:30 a.m. on *15 April* and a second version at about 10:30 a.m. on *15 April* (although neither was in the form of the version finally released). The second version was expressed to supersede the version sent earlier in the morning. The first version had also been accompanied by a draft script and Q&As for the members of the PjT due to attend the anticipated press briefing in the afternoon. No comments were received from Government on either version.

4.152 The press statement began by describing in some detail the flooding of the TBM in the contract 823A north tunnels. It then continued, more briefly, to describe delay issues experienced at contract 826 and in WKT. A copy of this press statement is at Appendix 6.

4.153 The LD&S and the Corporate Relations Department planned to send a copy of the press announcement to the Board at the same time as or shortly after its release. However, a communications problem ensued between the Corporate Relations Department and the LD&S and the press release was not sent to the Board until two hours after the press briefing.

4.154 When circulating the press release to the Board, the LD&S indicated that a full briefing on this subject would be given at the forthcoming Board meeting, to be held on *29 April 2014*. However, following their receipt of the press announcement, certain members of the Board contacted the Chairman directly and requested that he call a Special Board Meeting on *16 April 2014*, which he did.

A Special Board Meeting was held on *16 April 2014* to discuss the delay to the Project. On the same day a special PSC meeting was also held at which the DHy requested that the Corporation provide further information to assist Government to analyse in detail the latest progress of the Project.

Part V – Findings and conclusions

Reasons for delay

- 5.1 The reasons for delay to the Project are numerous. Some apply to the Project as a whole, including labour shortage issues which are affecting all construction projects in Hong Kong, other reasons vary by contract area and may relate, for example, to local geology, different site access issues in the early phases of the Project or unforeseen events occurring. More specifically, for contract 810A (WKT), progress had been and is still affected by unfavourable ground conditions, utility diversion complications, site co-ordination and inadequate work fronts. For contract 826 (cross-boundary tunnelling), progress had been affected by the late arrival of the TBMs from the Mainland. For contract 823A (Yuen Long Tunnel section), progress had been affected by the slow excavation rate of the two TBMs. The flooding of one of the TBM has made things worse. The key causes of delay in the different contract areas are described in Part IV. These descriptions are based on information provided to the IBC by the PjD and members of the PjT.
- 5.2 As indicated in the Introduction, the IBC has appointed two independent experts to assist it in a review of the Corporation's project management systems and processes and to consider whether any improvements are required. Appropriate milestones to completion before the end of 2017 will need to be established, monitored and reported on. However, in its review of the causes of delay to date, the IBC has not yet seen or heard any evidence to suggest that there are obvious or systemic flaws in the Corporation's project management processes which have contributed to the delays or that there was any inadequate site investigation or technical preparation by the Corporation.

Conclusion

- 5.3 There have been numerous causes of delay during the course of the Project. The IBC has not identified any systemic flaw in the engineering aspects of the project management process which would suggest that those delays should have been avoided or could reasonably have been handled better. However, in the interests of better project delivery, the IBC will ask its independent experts to look at the causes of delay in the light of the project management processes being employed by the Corporation and consider whether

amendments or improvements are required.

- 5.4 The IBC has not seen any evidence to suggest that in their day-to-day work the PjT has not followed the systems and procedures established in accordance with the requirements of the Entrustment Agreement and vetted by Government and the independent M&V Consultant.

Partial Opening

- 5.5 For the PjT opening passenger services by the end of 2015 under the terms of the Entrustment Agreement meant meeting the goal of being able to provide safe railway services for 99,000 people⁸ in accordance with the design specifications at that time agreed with Government. At the time that the Entrustment Agreement was entered into, the Project programme envisaged a two phased opening. The first phase, expected to be completed under the original Project programme by 2015, consisted of 10 operational tracks: four short-haul tracks and six long-haul tracks. It was envisaged at the time that capacity at WKT would then subsequently be expanded (within the existing infrastructure of the terminus) to accommodate a further five tracks for a total of six short-haul tracks and nine long-haul tracks.
- 5.6 Due to the delays at WKT, the Partial Opening plan was proposed by the PjT on 13 July 2013 to the CEO, DCEO and FD to enable a passenger service that would still be able to meet all of the operational requirements that had been agreed with Government. However, it would also allow certain other non-essential works (i.e. non-essential to Day-1 operations) at WKT to be completed during the following six months or so.
- 5.7 There were two key changes introduced under the Partial Opening proposal. First, the service would be initiated with just six long-haul tracks rather than a total of 10 short-haul and long-haul tracks. The OD had confirmed to Government that the six track operation would still be adequate to meet the Day-1 train service requirements and patronage forecasts. Second, there would still be ongoing construction works after the start of passenger operations, including

⁸ Based on a two-way daily patronage.

parts of the facility and non-essential works such as footbridges. The permanent roof of the terminus would also be completed after the railway had become operational.

- 5.8 The PjT engaged with Government on this and the same presentation that was made on *13 July 2013* to the CEO and other executives was made to the HyD and the RDO on *13 September 2013*. A similar presentation was made to the THB on *8 November 2013*. As mentioned below, the difficulties with WKT and the Partial Opening proposal raised at this meeting on *8 November 2013* were overshadowed by the severe delays with cross-boundary tunnelling under contract 826. There seems to be no dispute that the PjT and the PjD had told Government about the delays at WKT being such that in their view WKT could only be opened by the end of 2015 on a Partial Opening basis. However, as stated by Government subsequently (in its letter from the STH of *15 May 2014* to LegCo) in its view Government had not agreed to such an arrangement as it needed more information and in November the crux lay in the assessment of progress of cross-tunnelling works under contract 826.
- 5.9 This Partial Opening proposal was born as a result of the delays at WKT. It was not a unilateral solution that could be imposed on Government under the terms of the Entrustment Agreement. If implemented, Partial Opening would have constituted a material change to the Project programme which would have required the agreement of Government.
- 5.10 Ultimately, Partial Opening was not implemented as part of the Project programme and by *31 March 2014*, following the presentation by the WKT contractors to the PjD, it was clear that the status of the critical path of the terminus was such that even on a Partial Opening basis works would not be sufficiently advanced to allow operations by the end of 2015.
- 5.11 The IBC finds that the Partial Opening proposal would have been a significant variation to what stakeholders were expecting (including the Board) according to the Project programme. On this basis, the need for Partial Opening should have been brought to the Board's attention at the earliest opportunity.
- 5.12 When raised in the IBC's interviews with members of the ExCom, those members of the ExCom agreed that with the benefit of hindsight the proposed change in the WKT programme to a Partial Opening in 2015 should have been raised with the Board.

Conclusion

- 5.13 It is the IBC's view that the distinction between operational matters, which are within the authority of the ExCom, and strategic matters of public importance, which should be escalated to the Board, was not given sufficient attention by the ExCom after it had been made aware of the Partial Opening proposal. The IBC finds that the failure to report the Partial Opening proposal by the ExCom to the Board reflects poor judgement in particular on the part of the PjD (when taking into account his role and responsibilities as overall projects director of the Corporation) and the CEO (when taking into account his role and responsibilities as chief executive officer of the Corporation).

Entrustment Agreement

- 5.14 Government appointed the Corporation to manage the design and construction of the XRL under the terms of the Entrustment Agreement. Government has the responsibility under that agreement to pay the cost of designing and building the Project as Government (not the Corporation) will be the owner of the railway, WKT and other infrastructure. There is an understanding that Government and the Corporation will in due course negotiate and agree the terms on which the Corporation will operate the XRL on a concession payment basis. There was a previous entrustment agreement entered into in November 2008 between Government and the Corporation for the design and site investigation of the Project. This is mentioned for completeness but, in the IBC's view, nothing critical turns on that earlier agreement.
- 5.15 The Entrustment Agreement is clear that the Corporation has the roles and responsibilities as a project manager working on behalf of Government in carrying out the Entrustment Activities. The Corporation has developed a compliance framework within its organisation to ensure its proper implementation of and continuing adherence to the terms of the Entrustment Agreement.
- 5.16 What is different about this Project from other private sector developments is that Government has a department, the HyD, constantly monitoring the Project. The DHy chairs the PSC at its regular monthly meetings. In addition, the RDO performs a monitoring role on-site and in the PCG. Government has also engaged the M&V Consultant as checker for the Project.

- 5.17 Government is not only the contractual counter-party but is also the majority shareholder of the Corporation, has representatives and nominees on the Board and is also the Corporation's regulator in relation to its Hong Kong railway activities. This makes the relationship between the Corporation and Government very different from that of just a project manager and client. However, while the Corporation and Government may work closely in collaboration on the Project, they are not partners in the Project; there is no sharing of profits and losses for the Project.
- 5.18 The responsibilities for the actual construction of the Project rest with the contractors appointed to build various parts of the Project in accordance with the specifications and terms in their respective construction contracts. Such contractors include, for example, engineering and architectural consultants to design the Project. The contractors for the various works all have detailed and defined obligations in their contracts for ultimate delivery of specified parts of the Project. The PjT is responsible for co-ordinating the completion of these various contracts.
- 5.19 The Entrustment Agreement provides that the Corporation must use its best endeavours to complete the works by the Estimated Handover Date. The Entrustment Agreement provides a mechanism for adjustment to the timing of Project delivery. Government and the Corporation accepted at the time the agreement was written that with a programme of works as large as the Project, flexibility on timing had to be built into the agreement and the Corporation would use its best endeavours to meet the anticipated timetable.
- 5.20 All contracts for the Project are subject to variations in time and cost due to unforeseen circumstances and changes that may be required. In a vastly complex engineering project such as the XRL, unforeseen events will happen. In those cases, the project manager will work with the contractor to mitigate the delays. In engineering contracts such as those entered for the Project, engineering solutions developed by taking into account and in reliance upon the relevant contractor's expertise are essential. Government closely monitors all agreements reached with contractors relating to variations in time or specification. The Corporation as project manager for Government uses its requisite professional competence to manage the Project on behalf of Government.

Conclusion

- 5.21 The IBC has been impressed by the hard work and dedication it has seen demonstrated by the members of the PjT in their endeavours to manage the difficulties and complexities of this Project.
- 5.22 The Corporation has agreed under the terms of the Entrustment Agreement to use its best endeavours to complete the Project (as it was then described in the Entrustment Agreement) by the original estimated completion date of August 2015. It is not unusual for engineering and construction projects of the size and complexity of the Project to experience unforeseen delays and difficulties.
- 5.23 The Corporation has processes and procedures in place to ensure that it is carrying out its obligations under the Entrustment Agreement.

Corporation's project management

- 5.24 The XRL is a very large and complex project involving the construction of a new railway system and passenger terminal in the middle of a densely populated urban area. It involves the engagement and co-ordination of multiple contractors of various specialities during the different phases of the life of the Project. During the fact finding process (involving site visits and interviews of various members of the PjT), it appears to the IBC that the PjT has inherited a number of high quality project managers and other experts with a wealth of experience from within the Corporation and elsewhere in managing the construction of railway infrastructure.
- 5.25 The IBC has been impressed by the levels of knowledge, apparent skill and commitment demonstrated by the PjT. The complexity and scale of the Project are difficult to overstate. The IBC is pleased to see a very high emphasis placed by the PjT on site safety.
- 5.26 As mentioned elsewhere in this report, the PjT's activities and reporting of the Project progress have been under constant review not only by the HyD/RDO but also the internal audit functions of the Corporation as well as the M&V Consultant employed by Government. The M&V Consultant has its base on-site and works side-by-side with many members of the PjT on a daily basis.
- 5.27 The IBC believes that the PjT has managed the engineering aspects of the delays in the Project arising from a number and wide variety of circumstances and events in a professional manner. However,

looking at the scale and complexity of the five railway projects the Corporation is conducting in Hong Kong at the same time, the IBC also notes that with the benefit of hindsight the Corporation and Government may have paused to consider the relative timetables of all five projects (in particular when taking into account more macro-economic factors, such as the acute labour shortage in the Hong Kong construction industry).

Conclusion

- 5.28 The IBC believes the PjT has shown high levels of commitment, diligence and project management skills. The Corporation's compliance with its project management systems and processes in respect of the Project has been reviewed by both its internal audit function and, the IBC understands, the M&V Consultant appointed by Government. No adverse findings have been brought to the IBC's attention as to non-compliance.
- 5.29 Notwithstanding this conclusion, as described above, the IBC has appointed two independent experts to review the Corporation's project management systems and processes in respect of the Project. These experts will then be asked to propose any enhancements they may see as appropriate.

Reporting to Government

- 5.30 The IBC believes that through the life of the Project, members of the PjT and Government representatives have worked together in a co-operative and collaborative manner. As already described in Part III above, there is a very detailed level of reporting on the Project to Government (in its various departments). While the framework for much of that reporting is set out in the Entrustment Agreement, there is frequent working level contact on site between the PjT and representatives of the HyD and the M&V Consultant.
- 5.31 Under the Project management procedures established with Government, all proposed delay mitigation measures and DRMs need the approval of the PCG before they can proceed. All modifications and changes with cost implications including DRMs are forwarded to the HyD before they are approved. (Reference is made to the May 2014 paper issued by the HyD to the RSC to provide a detailed review of the extent of Government's role in monitoring the Project, and approving contract variations and DRMs, see Appendix 7.)

- 5.32 It appears to the IBC that the progress of the Project from inception to the announcement of delayed completion in April 2014 was reported on in detail to the PSC and the HyD. Information provided included the progress status of all individual contracts and bar charts showing overall progress of the Project (including against the programme timetable). The IBC finds that delays against the Project programme have been reported in a timely and accurate manner to Government through the PSC and the PCG in accordance with the terms of the Entrustment Agreement. The IBC does not find any attempt by the PjT or the Corporation to cover-up or hide the delays being experienced in the various Project contracts.
- 5.33 There are detailed records of the papers presented to the PSC and minutes of such meetings. The programme status charts showed consistent cumulative delays to many contracts and increasing divergence between actual and programmed progress to the relevant date. The DHy, as Chairman of the PSC, had on a number of occasions expressed concern over the delays and a more detailed roadmap to opening in 2015 was requested at the PSC meeting on *29 November 2013*. At that meeting and, following briefings to the RDO/HyD and the DHy in August and September 2013, it is clear that all involved were aware of the irrecoverable delays at WKT and the Corporation's Partial Opening proposal for opening services at WKT by the end of 2015.
- 5.34 The IBC considers that the meetings with Government on *8 November 2013* and then on *21 November 2013* are indicative of the high level of knowledge of Government regarding the problems and delays being experienced in the Project and the lack of progress. However, Government was often assured by the Corporation that delays in the Project could be recovered to achieve opening in 2015.
- 5.35 Straight after the *8 November 2013* meeting, a report should have been made to the ExCom that the PjT had communicated to Government that the Project would likely open after 2015 due to the delays on the cross-boundary tunnel. However, it does not appear that anything was said about this to the CEO with the result that the telephone calls and meeting of *21 November 2013* appear unplanned and unco-ordinated. It appears that the bi-directional tunnel solution was only for the first time communicated to the CEO and then Government on the *21 November 2013*, not giving time for its proper consideration. This is despite the fact that the CEO had spoken to the PjD about the status of the Project and the ability to commence

services in 2015 before returning the call to the STH. The PjD and the OPD joined the CEO on the call and also attended the meeting with Government that evening (at which the General Manager, XRL also attended).

- 5.36 During the meetings on *21 November* with Government, the PjD, while still asserting his confidence that opening could be achieved by the end of 2015, stated that the Corporation would be able to give a better view of progress in six months. By then, tunnelling in Hong Kong on contract 826, the cross-boundary tunnels, should have begun. Government notes and the Corporation's representatives' recollections of these meetings show, though, that the PjD did not communicate with Government (or the CEO, Board or ExCom) regarding the mounting concerns of the PjT as to the cumulative effect of delays across key parts of the Project and the concern that DRMs would not prove sufficiently effective to achieve an opening of the railway line by the end of 2015.
- 5.37 The IBC believes that while Government clearly had access to a great deal of information regarding delays it should have been given a fuller assessment of the achievability of the overall Project timetable.
- 5.38 When questioned by the IBC on *9 May 2014* concerning this issue, the PjD indicated that he was still in discussions with the principal contractors regarding recovery measures, he was waiting for the contractor at WKT to respond with a revised Partial Opening based timetable as had been and was being requested by the PjT and he believed that there was still time to the end of 2015 for DRMs to be implemented and be effective.
- 5.39 The IBC views the PjD as someone whose leadership style does not allow delays or slippage without a fight. He was appointed by the Corporation in 2010 based on his track record and reputation within the construction industry. However, in asserting that delays could be recovered, he did not highlight the possibility of delay to the completion of the Project by the end of 2015 at key meetings with Government during November 2013.

Conclusion

- 5.40 The Corporation was at all times transparent and accurate in its reporting of the progress of the Project both against the Project programme and budget. The Corporation had also, no later than

September 2013, communicated to Government its concern that it would not be able to complete WKT by the original Estimated Handover Date in August 2015, but would be able to operate a passenger service by the end of 2015 out of WKT on a Partial Opening basis. The Corporation had also discussed with Government in November 2013 its concerns regarding the delay in contract 826.

- 5.41 Through the application of its project management processes, the PjT identified to the PjD in November 2013 that the accelerating divergence between planned and actual construction/tunnelling progress meant that even on a Partial Opening basis an operational opening by the end of 2015 was very unlikely. The more analytical and objective assessments communicated by those members of the PjT regarding the effect of the cumulative delays on the critical path of the Project should have been reported by the PjD to Government.

Reporting on the Project to the CEO, ExCom, Audit Committee, Board and Chairman

- 5.42 Within the Corporation there are a number of matters delegated by the Board to be dealt with by the ExCom without needing to be referred back to the Board for approval. These are operational matters relating to the various railway and other business functions of the Corporation. The ExCom is chaired by the CEO and the Chairman presides over the Board. There is therefore a distinction between management at the ExCom level and governance at the Board level. For a project of the scale of the XRL, the Board must be engaged. However, as noted above, the IBC finds that important matters relating to the Project were not brought to the attention of the Chairman, Board or Audit Committee. The result was that the Board could not monitor effectively the progress of the Project and provide guidance and, where necessary, challenge the views and actions of the CEO, PjD and the other members of the Executive Directorate in relation to the Project.
- 5.43 Various presentations were made to Government regarding the feasibility of commencing passenger services by the end of 2015 on a Partial Opening basis. The key discussion with the PST and the HyD on *21 November 2013* was (in the opinion of the IBC) framed by the understanding on all sides that the original WKT specification would not be achievable by end 2015. The IBC appreciates that the Partial Opening proposal was raised with Government. However, the IBC believes that such a proposed change should have been brought to the attention of the Board, Chairman and Audit Committee on a

timely basis. This would have instigated an awareness of and a debate by the Board on the obstacles facing the Project. It would have allowed the Board to offer a view on announcing or discussing those obstacles with stakeholders including LegCo and the public.

- 5.44 The ExCom minutes show that the Project was reviewed on a number of occasions by the ExCom with the PjD and other members of the PjT. While delays and challenges in the Project were discussed, the questions from the ExCom were only answered by the PjD who, while referring to various difficulties, replied in the same manner as he had to the Board, namely that the Project would be delivered by the end of 2015 and on budget. Notwithstanding the level of delays noted in briefings to the ExCom on a regular basis, it appears that until April 2014 the ExCom accepted the PjD's assertions that the delays being highlighted in the Project would either be dealt with through successful DRMs or would otherwise be worked around under the programme.
- 5.45 The CEO has indicated to the IBC that, in addition to attending a number of ExCom meetings at which certain members of the PjT were present with the PjD, he also met with the PjD individually and reviewed with him the status of the Project on a frequent basis. In those meetings the CEO had accepted and relied in good faith upon the assurances given to him by the PjD that notwithstanding the delays the Project would still complete by the end of 2015 on a Partial Opening basis.
- 5.46 The CEO has told the IBC that he was not alerted in any way to the expressed concerns of the PjD or other members of the PjT regarding the cumulative effect of the various contract delays. The CEO has also noted to the IBC that during such period the Internal Audit and the Corporation's other Project control functions did not raise such concerns either.
- 5.47 The Audit Committee considers project progress twice a year to ensure that there is an appropriate system of internal controls to protect the financial interests of the Corporation. From an internal audit perspective, the Audit Committee considers whether the PjT is properly documenting and evidencing its compliance with the Corporation's project management protocols and manuals.
- 5.48 At his presentations to the Audit Committee in February 2013 and March 2014, the PjD had referred to "*critical*" delays in respect of the Project. However, this was in the context of a broader discussion

on delays on other projects and, as suggested in the respective minutes for those meetings, remedial measures were being taken to catch up those delays. Therefore the Audit Committee came away from those presentations with the message that while there were delays, overall, the Project would complete within the original timeframe and budget.

- 5.49 As regards reporting to the Board, while the Board papers when dealing with the Project made reference to delays in certain contracts and various difficulties and other delays being encountered, the questioning by the Board of the PjD (for example at its meetings on *22 August* and *10 December 2013*) met with the consistent assertion by the PjD to the Board (as well as to the ExCom and the Audit Committee) that the Project would be delivered on time and within budget. There was no suggestion that the cumulative effect of various contract delays was making the anticipated timetable almost irretrievable. There was no reference to the Board or the Chairman regarding the need for Partial Opening or that the tunnelling progress on contract 826 had reached such a delay that Government at first felt obliged to announce a delay in the Project prior to the meeting and discussion on *21 November 2013*.

Conclusion

- 5.50 The PjD's assertions that the cumulative delays could be recovered were misconceived and should have been acknowledged by the PjD as such much earlier than was the case. The IBC has seen that timetable controls and future forecasting processes were being applied by the PjT. There are also clear indications that the members of the PjT alerted the PjD to timetable concerns and that the PjD himself had concerns about the timetable in October and November 2013. However, the PjD should have brought these concerns to the CEO's, ExCom's, Board's and Audit Committee's attention. The PjD admitted in interview with the IBC that there were certain occasions in November 2013 and thereafter when he should have alerted (and had the opportunity to alert) the Board and regrets that he did not do so.
- 5.51 It is also unfortunate that there was a "chain of command" style of approach within the PjT as to who did the talking so that caution and concerns were not openly raised by others at the same time and to challenge the PjD's assertions that an opening for the XRL in 2015 was achievable and the PjD's failure to notify the CEO, ExCom, Audit Committee and Board of such concerns of the PjT.

5.52 The CEO and ExCom collectively relied on the information and views provided by the PjD. The IBC accepts that it is important for the cohesiveness of any organisation for senior management to back the judgement of colleagues and not to be required to shadow other senior executives' activities. Nevertheless, given the CEO's knowledge of the sustained delays in the Project programme and particularly given the importance of the Project to Government, and the level of public interest in it, the IBC believes that the CEO should have exercised more critical judgement in respect of monitoring the progress of the Project as a whole. There are times when some professional scepticism is required to ensure that the goodwill and reputation of the organisation is not being staked on the assurances of one person.

Communication strategy and crisis management

5.53 The potential for serious delays at WKT was first made known to the PjT in April 2013. While the genesis of the crisis on the XRL was the delay itself, poor communication management led to the delay becoming a crisis. Crisis management requires intelligent anticipation of events and a project specific communication plan that is kept under frequent review.

5.54 At the ExCom meeting on *19 September 2013*, chaired by the DCEO, the delays in the Project were discussed and members of the PjT referred to their key assumption that mitigation measures had to be successful to allow opening on schedule. At that meeting, the DCEO asked the Corporate Relations Department to start preparatory work regarding the "*line to take*" taking into the account the status of the Project. The IBC has seen no evidence that this was logged on the register of matters arising and followed up at the next ExCom meeting or by the DCEO.

5.55 The members of the ExCom (except the PjD) were not aware of the delays in the Project timetable to 2017 until it was presented to them by the PjD at the meeting on *Saturday 12 April 2014*. The ExCom at that meeting, and without any prior preparation or any communication plan, had immediately to review the Corporation's position in terms of communication of the delay to Government and the Hong Kong public, provide a feasible likely completion date for the Project and mitigate the resulting lack of credibility that the Corporation would suffer due to the inability to deliver the Project in line with the assurances given to Government. The CEO immediately informed the Chairman and the STH of the delay in the Project and

began to discuss with each of them a communication strategy in relation to the delay. If the possibility of delay had been properly anticipated, even though the ExCom had been taken unawares, there would have been a more joined-up approach to notifying the Board, all the key Government representatives and the public.

- 5.56 On Monday *14 April* the STH and the CEO agreed that an announcement would be made the following day. The CEO proposed a joint press briefing, but the STH said that Government (the HyD) wanted to hold a separate press briefing from the Corporation. It was determined by members of the ExCom that this should be treated as an operational matter and therefore the Corporation's press briefing would be led by the PjD and not the CEO.
- 5.57 Although the CEO had promptly notified the Chairman and the STH (in his official capacity) of the delay on *12 April 2014* after the presentation by the PjD, the IBC does not believe that any other member of the Board had been notified by any member of the ExCom of these events over the period from *12 April* to the issue of the press release on *15 April 2014*, nor was a Board meeting called.
- 5.58 The press statement of *15 April 2014* went through a variety of drafts initiated and co-ordinated by the General Manager - Corporate Relations. The press statement was reviewed by certain members of the ExCom, senior members of the PjT and the Chairman. The final version was approved for issue by certain members of the ExCom. A draft was also sent before issue to Government, although the IBC understands that no comments were received from Government before the press statement was released.
- 5.59 The press statement was sent to the Board members about two hours after its issue on *15 April*. As mentioned above, although the CEO had contacted the Chairman immediately upon learning of the delay on *12 April*, at no time prior to the issue of the press release was there raised by the Chairman or CEO the possibility of calling an emergency Board meeting to discuss the Project delay. If a Board meeting had been called, the Board would have been able to discuss the communication strategy and the content of the press statement. The Chairman did note at a meeting of the Corporate Social Responsibility Committee on *15 April 2014* that perhaps a Board meeting should be called sooner than the scheduled meeting on *29 April 2014* and a meeting was called on *16 April 2014*.

- 5.60 Given the importance of the XRL to the people of Hong Kong, the IBC believes that a discussion at Board level regarding the steps proposed to be taken and the content of the press statement would have led to a more comprehensive communication strategy for the delay.
- 5.61 The IBC considers that the crisis management shown by the ExCom led by the CEO during this period fell short of the levels of foresight which the Corporation should expect of itself given its place in the community in Hong Kong and as an international railways owner/operator.

Conclusion

5.62 The IBC finds that:

- (A) the failure of the PjD to communicate the likelihood of delays had deprived the Corporation of the opportunity to manage the situation in which it found itself on *12 April* and the following few days in the best possible way;
- (B) although the Chairman was promptly notified by the CEO of the delay and was advised on the communication strategy, an emergency Board meeting should have been called prior to the press briefing or the release of a press statement on *15 April 2014* to review a detailed communication strategy for announcing the delay and steps to be taken to achieve the earliest possible opening of the XRL for passenger services;
- (C) the Corporation should have given a press conference on *15 April 2014* as opposed to a press briefing;
- (D) notwithstanding the CEO had been advised not to attend the Corporation's press briefing on *15 April 2014*, in recognition of the importance given to the Project by Government and the public, particularly in the light of the statement made by the STH at the Government media stand-up earlier that day, the CEO should have led the press briefing as opposed to the PjD;
- (E) by its tone and content the press statement materially overstated the effect on the Project programme of the flooding of the TBM (contract 823A);

- (F) the Corporation's media management does not appear to have been effective in the days following the press statement and press briefing; and
- (G) while the genesis of the crisis on the XRL was the delay itself, poor communication management led to the delay becoming a crisis; and
- (H) all of the above led to a serious loss of credibility for the Corporation and put the Corporation on the back foot when it came to explaining the difficulties and challenges of the Project, how many of such challenges and difficulties had been successfully overcome and how those still remaining had to be dealt with.

Part VI - Recommendations

- 6.1 As a result of its findings and conclusions, the IBC recommends that there should be certain enhancements to the Corporation's systems and processes as follows.

Enhanced project reporting

- 6.2 The Board should review with the ExCom the format and content of future project reporting to the Board and the Audit Committee to ensure that both are presented with clear and comprehensive information regarding the projects underway as well as being advised of the critical challenges facing each project. There should also be a review of the financial progress of each project. The reporting on individual projects as above should then be summarised for the Board and the Audit Committee by the PjD, signed off by Project Programming and Procurement teams and endorsed by the CEO and the FD.
- 6.3 The ExCom should review its system of allocating clear accountability for actions required and for subsequent follow-up that those actions have been taken.
- 6.4 The Board and the ExCom should encourage a culture of healthy debate and constructive challenge by all team members within the Corporation.

Capital Works Committee

- 6.5 The Board should establish a Capital Works Committee to oversee in the future any project involving design and/or construction with a capital value of a certain material size as assessed by the Board.
- 6.6 The CWC would:
- (A) be chaired by an INED;
 - (B) comprise such members as the Board determines;
 - (C) report to the Board on a quarterly basis on the progress of the relevant projects and their respective budgets;
 - (D) check that there are adequate resources for and supervision of those projects; and

- (E) keep under review the Corporation's communication strategy and crisis management plan in respect of each of those projects.

The CWC's role is not to manage the relevant projects but to provide oversight and a review to the Board in relation to the projects' progress.

Enhanced communications strategies

- 6.7 Recognising that corporate communications are a strategic matter for the Corporation, the IBC urges the Board to undertake a comprehensive review of the Corporation's communications strategy with the aim to improve transparency, timeliness and pro-active engagement with stakeholders, particularly the public.
- 6.8 The IBC recommends a review of the corporate relations planning in respect of progress of projects, including a review of the flow of information among the PjT, ExCom and Corporate Relations Department as well as how the PjT identifies and anticipates issues for communication.

Appendix 1

IBC members, meeting dates, interview and site visit dates and appointed experts

Members of the IBC

Prof. Frederick Ma Si Hang (Chairman)
Dr. Dorothy Chan Yuen Tak Fai
Mr. Edward S T Ho
Mr. Alasdair Morrison
Mr. Abraham Shek Lai-him
Mr. T Brian Stevenson

Dates of the IBC meetings

9 May 2014
19 May 2014
26 May 2014
9 June 2014
16 June 2014
23 June 2014
25 June 2014
26 June 2014
30 June 2014
2 July 2014
9 July 2014
11 July 2014

Interviews conducted by the IBC

9 May 2014
19 May 2014
23 May 2014
29 May 2014

Site visit by the IBC

22 May 2014

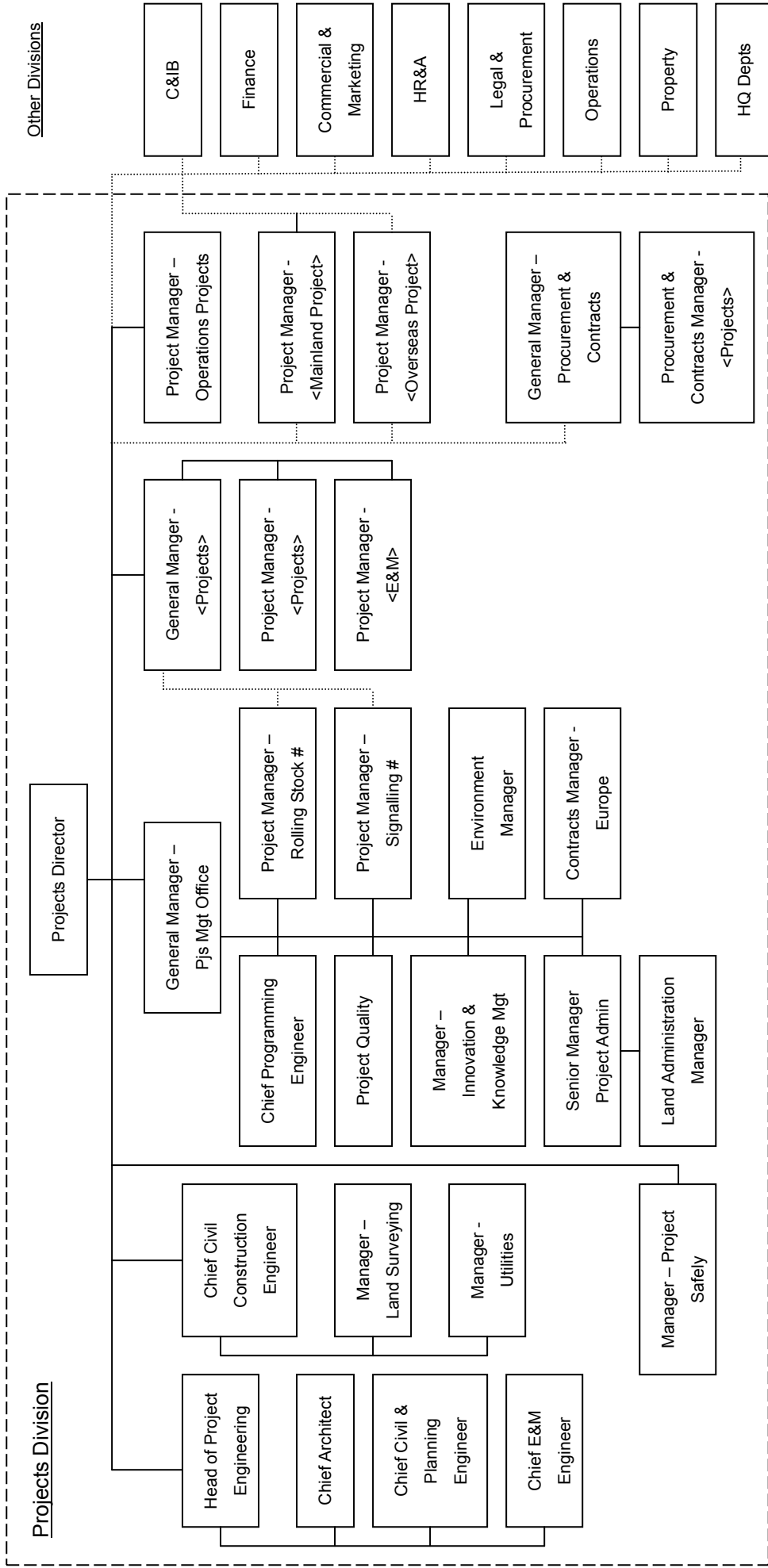
Experts appointed by the IBC⁹

Prof. Bent Flyvbjerg
Prof. Tsung-Chung Kao

⁹ CVs for Professor Flyvbjerg and Professor Kao are provided at Appendix 8.

Appendix 2

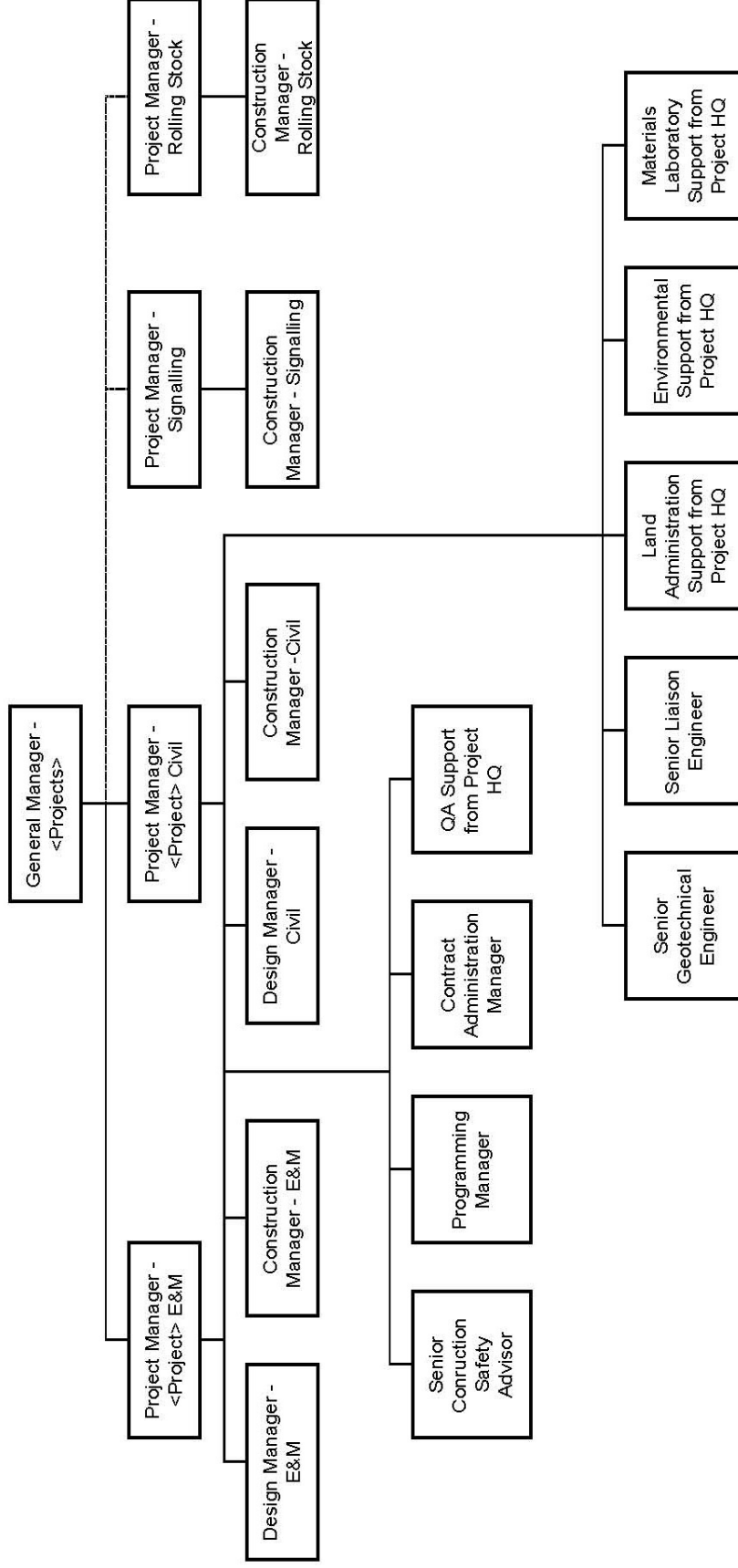
Projects Division organisation chart for railway projects



Appendix 3

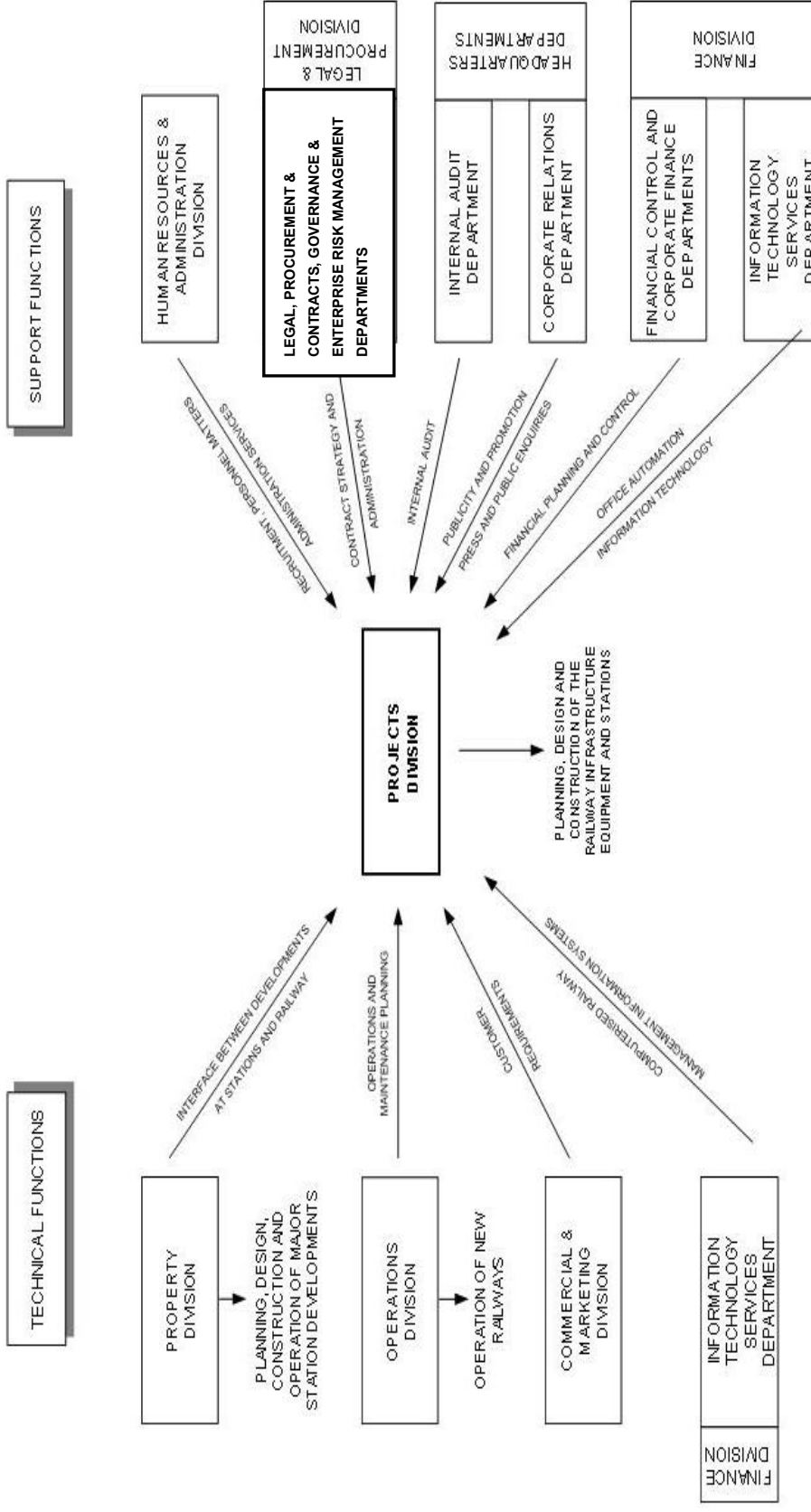
Typical organisation structure for a project management team

Adopted from the Projects Division manual MAN/004



Appendix 4

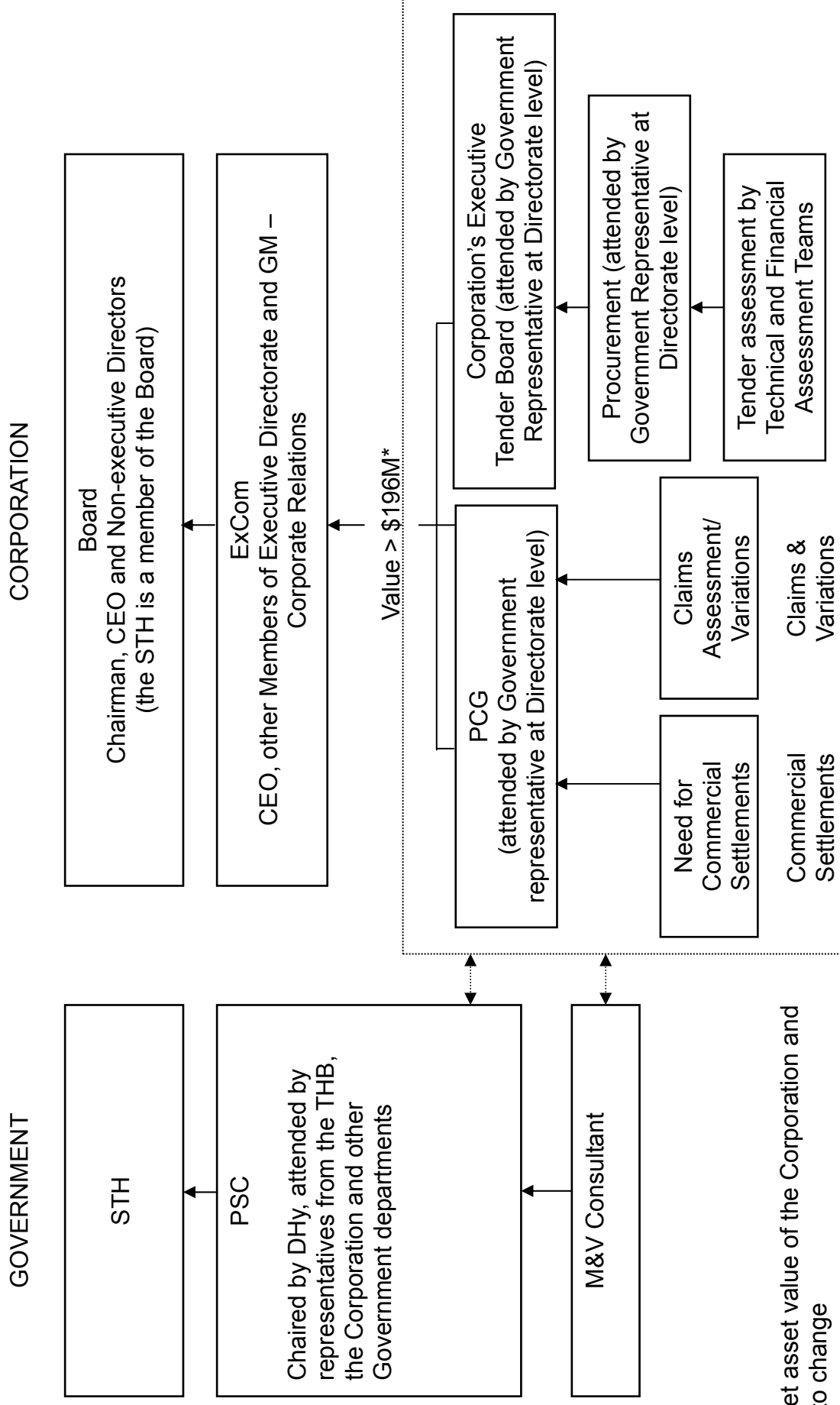
Interaction between the Projects Division and other departments within the Corporation



Appendix 5

The interface between controls: (i) within the Corporation; and (ii) those involving parties external to the Corporation

Adapted from Annex F of LC Paper No. CB(1) 1573/09-10(04)



*0.2% of net asset value of the Corporation and is subject to change

Appendix 6

Press statement released by the Corporation on 15 April 2014

Revised Programme for Hong Kong Section of Express Rail Link Project

A tunnel boring machine (TBM) severely damaged by floodwater is affecting progress on the Hong Kong Section of the Express Rail Link (XRL) project. This unforeseen challenge has added to the difficulties of the project and will push the completion date to 2016 with the line ready for operation in 2017.

“The Express Rail Link project is a very large undertaking and immensely complex. Since construction began, we have been presented with numerous challenges which have put pressure on our schedule,” said Mr T C Chew, Projects Director of MTR Corporation. “We have been very focused on catching up through fine-tuning designs and adjusting the construction works but this latest situation with the TBM makes it clear that completion of the project by 2015 is not achievable.”

During the black rainstorm on 30 March 2014, a section of tunnel in Yuen Long connecting Tsat Sing Kong and Tai Kong Po was flooded when heavy rain washed soil and debris into the work site, blocking the surface drains. As a result, flood water found their way into the partially bored tunnel where the TBM was located.

After clearing the site, the MTR project team, the contractor and TBM manufacturer conducted detailed inspection of the TBM to assess the extent of the damage. Their findings have concluded that substantial repair work is required, particularly complete replacement of the sophisticated electronic components, before the TBM can become functional again. Further studies are being carried out to determine whether the TBM should be repaired or if an alternative method should be used to finish excavating the remaining tunnel section. The current assessment is a prolonged delay of up to nine months in the construction programme.

There are two other critical locations where the challenges are of particular concern. One is the extremely difficult ground condition at the West Kowloon Terminus site. The underground rock strata sitting at a higher than expected level is requiring more time to excavate. But progress has also been hindered by boulders and uncharted utilities that had to be negotiated during the excavation process.

The second critical challenge involves the complex geology at the cross-boundary section of the tunnels under the protected wetland area. As marble caverns are known to be located in the zone, tunnel boring work have to proceed with extreme care and any unforeseen circumstances will have to be dealt with as they surface.

"As you can appreciate, the unforeseen challenges of this project are great. Difficult ground conditions, unforeseen obstructions and the black rainstorm have all impacted our programme. While we make every effort to complete the XRL project as early as possible, we will strictly uphold our 'safety first' principle in the management of our worksites and the safety of our workers," added Mr Chew.

"Taking all this into account, we needed to set out a new timeline for the completion of the project, with major construction works to be finished within 2016. With the time required for testing and commissioning to ensure safe operations, the opening of the line for passenger service will be in 2017. We recognise the Government has entrusted the management of this project to us and we are sorry to have to bring forth this revised schedule. Nevertheless, this will now allow us to complete this project and deliver an important addition to Hong Kong's transportation network."

- End -

Appendix 7

Paper issued by the HyD dated May 2014 to the RSC for a detailed review of the extent of Government's role in monitoring the Project, and approving contract variations and DRMs

For information
May 2014

Legislative Council Panel on Transport
Subcommittee on Matters Relating to Railways

The Hong Kong Section of
Guangzhou-Shenzhen-Hong Kong Express Rail Link
Monitoring works by Highways Department
on Delay Mitigations and Recovery Measures

Purpose

This paper aims to describe the follow-up works carried out by Highways Department (HyD) regarding the delay recovery measures implemented under the Hong Kong Section of the Guangzhou - Shenzhen - Hong Kong Express Rail Link (XRL) project.

The “Monitoring and Verification” Approach

2. The XRL project is the first government-owned railway project implemented under the concession approach. In 2008, HyD commissioned a consultant, Lloyd’s Register Rail (Asia) Limited (“Lloyd’s”), to review and develop the appropriate institutional arrangements for entrusting the MTR Corporation Limited (MTRCL) to implement the XRL project. Lloyd’s recommended that the Government adopt the “monitoring and verification” role in the design and construction of the XRL, performing the “check the checker” role instead of “project manager” to monitor the MTRCL’s implementation of the XRL works. This approach worked on the basis of MTRCL’s project management procedures. The Government would engage its own “monitoring and verification consultant” (“M&V consultant) with railway experience to conduct monitoring and verification works to verify whether MTRCL had implemented the relevant processes as internally specified. Specifically, this would use a risk based sampling approach to verify delivery of the requirements of the project scope under the Entrustment Agreement (EA). Lloyd’s also advised that the Government’s resources could be utilized more effectively to avoid repetition and micro management of the project. Lloyd’s recommendations formed the framework of the monitoring system adopted by

HyD and its M&V Consultant, Jacobs China Limited, for the delivery of the XRL project by MTRCL.

3. MTRCL is entrusted to implement the XRL project, responsible for the design and overall management of the project including contracting with contractors for the construction works. During the project implementation, MTRCL has an overall plan of the project and knows all detailed design and construction details. In the case of delays, MTRCL, being the most appropriate party, has the responsibility to negotiate with the contractors for the implementation of delay mitigation measure or delay recovery measures (DRM) to catch up the programme. With the “check the checker” role, HyD and the M&V Consultant will provide MTRCL with their professional advice on the proposed DRMs.

4. Specifically, under the MTRCL project management procedures, all proposed delay mitigation measures and DRMs would need the approval of their Project Control Group (PCG) before the proposals can proceed. MTRCL would forward all modifications and changes to the XRL with cost implications including DRMs to HyD before they are approved. HyD and the M&V Consultant would provide professional advice on the proposals and follow up with the MTRCL. If HyD has any queries or questions on the effectiveness of the proposals, HyD would request MTRCL to provide additional information to justify the proposals, or even raise objection to the proposals. Under the EA, MTRCL is required to furnish HyD with the necessary information on the implementation of the project.

Monitoring works by Highways Department and the Monitoring and Verification (M&V) Consultant on DRMs

5. HyD and the M&V Consultant have been using various monitoring means to systematically monitor MTRCL in the implementation of the XRL project. This includes regular site visits to major XRL works contracts and site meetings with the site supervisory staff of MTRCL (i.e. once a month spanning 3 to 5 days), during which HyD would inspect the progress of various contracts, and comment on any potential construction risks and areas of concerns for MTRCL’s attention and appropriate actions. HyD and the M&V Consultant also attend the monthly Contract Review Meeting (CRM) with the site supervisory staff of MTRCL. HyD and the M&V Consultant would enquire MTRCL the latest situation on the works in the meetings, and discuss issues which may have potential impacts on the progress and programme of the XRL

project including important issues such as delay mitigation and recovery measures. In addition, HyD (led by an officer at Assistant Director level) attend the monthly Project Coordination Meeting with the General Managers of MTRCL to monitor the progress of various contracts, liaise and coordinate issues concerned with the delivery of the XRL project, e.g. liaison works with various government departments. The Director of Highways chairs the monthly Project Supervision Committee (PSC) meetings with the Projects Director of MTRCL and his team to review the project progress. Whenever there is a delay, HyD will request MTRCL for detailed explanation on the causes of delay and associated mitigation measures to catch up with the project programme.

6. Through the above multi-level monitoring mechanism, HyD can better understand the progress of various works contracts and progress delay in different sections of works, as well as notice any inadequacies on site, e.g. inadequate labour resources and work fronts, logistic and site coordination problems, etc. Whenever these problems are observed, HyD would urge MTRCL to follow up and implement effective mitigation measures to avoid further delay of works. If there are issues requiring liaison and coordination with various government departments, HyD would endeavour to facilitate MTRCL to resolve the issues in a timely manner so as to avoid affecting the progress of works.

7. The M&V Consultant also monitors the implementation of MTRCL's proposed mitigation measures and DRMs, and reports to HyD on the progress of relevant contracts whether the revised target programme can be met.

8. The following sections provide some examples of the delay mitigation and recovery measures implemented, and the monitoring actions by HyD and the M&V Consultant.

Contract 823A : Tse Uk Tsuen to Tai Kong Po Tunnels - Procurement of an additional Tunnel Boring Machine (TBM)

9. In April 2011, during the construction of the launching shaft of tunnel boring machine (TBM) under Contract 823A, the Contractor encountered rock head levels higher than those anticipated in the Geotechnical Baseline Report. This slowed down the progress of construction works and also directly affected the commencement of the subsequent tunnel excavation works. In order to recover the progress delay, MTRCL discussed with the Contractor and formulated a series of mitigation measures and DRMs which included the

procurement of an additional TBM to allow the two tunnel sections to be excavated simultaneously. MTRCL subsequently submitted the related DRM proposals to the PCG on 3 November 2011 and 1 March 2012 for approval. HyD and the M&V Consultant did not disagree with the effectiveness of the DRM proposals, and provided comments for follow up by MTRCL. Subsequent to the signing of a Supplementary Agreement between MTRCL and the Contractor in early 2013, the additional TBM was launched in March 2013.

10. HyD and the M&V Consultant monitor progress of the two TBMs through monthly and site visits, and discussed with MTRCL the performance of the TBMs and the issues encountered. In addition, HyD requested MTRCL to provide daily progress report of the tunnel excavation works for better monitoring on the operation and performance of the TBMs. This could allow HyD to timely review with MTRCL about the effectiveness of the DRMs and reflect concerns on the tunneling works. In view of the unsatisfactory performance of the two TBMs during rock excavation, HyD, in collaboration with relevant government departments, held working meetings with MTRCL on 23 July, 5 September and 16 December 2013 to discuss measures to improve the TBM operation and progress. MTRCL briefed HyD at various levels on the tunneling works and review the TBM excavation progress accordingly. The TBM excavation progress was improved after implementation of the improvement measures.

Removal and Re-provisioning of Nam Cheong Property Foundation

11. In mid-2010, in the course of pile-removal work under Contract 802, the Contractor found that the piles were deformed, and were not straight as indicated in the record drawings. Thus, normal extraction methods could not be deployed. As those deformed piles were in conflict with the XRL alignment, they had to be removed before the arrival of the TBM. Upon learning the above, MTRCL discussed with the Contractor about the measures to recover the delay. After exploring different options with Contractor, MTRCL suggested adopting a new “Rotator and Wedge” extraction method from Japan to remove these piles. Representatives of HyD, MTRCL and the Contractor visited Japan to inspect the effectiveness of the new method. It was concluded that the new method was effective. On 23 December 2010, MTRCL submitted a paper on DRM to the PCG. HyD and the M&V Consultant did not disagree with the effectiveness of DRM proposal.

12. In mid-2011, MTRCL reported that there was about a 44-week delay and a ten-week delay in the removal and re-provisioning of Nam Cheong Property Foundation against the original programme, and the revised working programme respectively. HyD and M&V Consultant kept monitoring closely the effectiveness and operation of the new method, visited the pile-removal site every month and hold CRMs with MTRCL regularly to track the removal progress. By adopting the new method, the Contractor successfully recovered the delay such that the piles were removed before the arrival of the TBM, and avoided affecting the interfacing tunnel boring works.

Temporary Traffic Management Scheme (TTMS) at Jordan Road (JOR)

13. Under Contract 811B “West Kowloon Terminus Approach Tunnel (South)”, the original plan was to divert Jordan Road (JOR) northward on top of the completed diaphragm wall at north of JOR, allowing the diaphragm wall within the existing alignment of Jordan Road to be constructed. However, the construction of diaphragm wall at north of JOR had delays due to adverse ground conditions including encountering of core stones. If no DRM was implemented, the JOR northward diversion would be delayed for about eight months from December 2011 to July 2012.

14. In view of the situation, the MTRCL presented the DRM proposal to the PCG on 29 September and 6 October 2011, proposing to first move JOR to the south allowing the Contractor to take up the major portion of the original space of JOR to construct the underground diaphragm wall and, at the same time, continue to complete construction of the diaphragm wall at north of JOR. HyD provided comments on the proposed DRM with particular concerns on its effectiveness and requested the MTRCL to submit further assessment on its impact to the nearby construction sites.

15. Since the PSC meeting held in September 2011, HyD raised concerns about the implementation of the TTMS concerned and requested the MTRCL to regularly report the progress. After the TTMS implemented in February 2012, the HyD and the M&V Consultant inspected the site regularly, monitoring the progress after the TTMS implementation. As a result, the construction of the diaphragm wall panels at northern part of West Kowloon Terminus had recovered of about six months progress.

Conclusion

16. As the “check the checker” role, HyD and the M&V Consultant monitor MTRCL’s works on the implementation of the project, and provide professional advice to MTRCL on the delay mitigation measures and DRMs proposal.

17. Apart from the above examples, the Independent Review Report prepared by the HyD also mentions other DRMs implemented under individual major contracts. Under the established monitoring system, the effectiveness of the DRMs implemented under key contracts has been monitored by HyD and the M&V Consultant.

Highways Department
May 2014

Appendix 8

Curriculum Vitae of each of: (1) Prof. Bent Flyvbjerg; and (2) Prof. Tsung-Chung Kao

Bent Flyvbjerg is the first BT Professor and Founding Chair of Major Programme Management at Oxford University and the first Director of Oxford University's BT Centre for Major Programme Management.

Professor Flyvbjerg is a leading international expert within the field of programme management and planning. He is the most cited scholar in his field and his ideas on optimism bias have been incorporated into project management around the world. Flyvbjerg continues to influence the development of project management both through his research, through advising government and business, and through teaching some of the leading programme managers of today and tomorrow.

Professor Flyvbjerg has 25 years of experience as consultant and adviser to government and business, including the UK and US governments, several Fortune 500 companies, major banks, the EU Commission, the United Nations, national audit offices, and regulatory bodies. •He has advised the UK, Dutch and Danish governments in formulating national policies for infrastructure, transportation, environment, and science.

His consulting experiences include

- Expert review of the contingency management procedures of the High Speed 2 project for the Department for Transport
- Advice on how to conduct the due diligence process of cost and ridership forecasts for California High Speed Rail, currently the largest infrastructure project in the developed world
- Advice on establishing Reference Class Forecasting at the Hong Kong Highways department
- Schedule risk assessment of a EUR 4.7 billion fixed link project in Northern Europe
- Review of megaproject risk management and assessment procedures of a Northern European utility company, including post mortem analysis of a EUR 2 billion megadam
- In-depth cost risk assessment of a EUR 6 billion high-speed rail line in Western Europe
- Creation of the UK Department for Transport's guidance document for procedures for dealing with optimism bias in transport planning.

His books and articles have been translated into 19 languages and his research has been covered by *Science*, *The Economist*, *The Wall Street Journal*, *The Financial Times*, *The New York Times*, *The BBC*, and many others. He has received numerous honours and awards, including two Fulbright Scholarships to the US, where he did research at the University of California at Los Angeles and Berkeley, and at Harvard University. Bent was knighted in the Order of the Dannebrog in 2002.

Bent received his Ph.D. from Aarhus University, Denmark, and in addition holds two higher doctorates from Aalborg University; in engineering (Dr. Techn.) and science (Dr. Scient.) respectively. He is a Professorial Fellow and non-executive director at St Anne's College, Oxford.

Tsung-Chung (TC) Kao, PhD, PE

University of Illinois at Urbana-Champaign

Director and Research Professor -High Speed Rail Systems

YEARS EXPERIENCE:

37

AREAS OF EXPERTISE:

- High Speed Rail Engineering
- Project Management
- Construction Management
- Geotechnical Engineering

EDUCATION:

Doctorate, Geotechnical Engineering, University of California, Berkeley, Berkeley, CA

Master of Science, Geotechnical Engineering, University of California, Berkeley, Berkeley, CA

Master of Science, Structural Engineering, Rutgers University, New Brunswick, NJ

Bachelor of Science, Civil Engineering, National Taiwan University, Taipei, Taiwan

SUMMARY

Dr. Kao has a long history of involvement in the Taiwan High Speed Rail Project. In 1990, he was involved in the feasibility study of the Project. In 1994, He served as the Advisor to the Provisional Office of the Taiwan High Speed Rail Project.

After the Taiwan High Speed Rail Project was privatized in 1997, he started an 11 year career in participating in the design, construction and operation of the Taiwan High Speed Rail.

Since April 2008, Dr. Kao taught at National Taiwan University, National Central University, Hong Kong Polytechnic University, and University of Illinois at Urbana-Champaign. The classes he taught included: "High Speed Rail Engineering", "High Speed Rail Planning", "High Speed Rail Construction Management", "High Speed Rail Operation & Maintenance" and "Integration Project Management", with particular illustrations of his experience in the Taiwan High Speed Rail project.

DR. Kao also serves as the adviser to World Bank on its High Speed Rail Projects in China.

EXPERIENCE

University of Illinois at Urbana Champaign

2010 - Present, *Director and Research professor - High Speed Rail Systems*

In spring of 2010, Dr. Kao traveled to the United States and taught "High Speed Rail Engineering", "High Speed Rail Planning", "High Speed Rail Construction Management" & "High Speed Rail Operation & Maintenance" at University of Illinois. These were the first such classes have been taught in the North America.

In 2011, he also served as a key member of the "High Speed Rail Feasibility Study between Chicago and Champaign"; this is a project with partnership of State of Illinois and University of Illinois.

World Bank

Since 2010, Dr. Kao serves as the Integration Testing &

Commissioning Adviser to the Bank on its investment high speed rail projects in China.

National Taiwan University

2008 - Present, *Professor, Railway Technology Research Center, Civil Engineering Department*

Dr. Kao teaches these classes at National Taiwan University: “High Speed Rail Engineering”, “Integration Project Management” and “Contract Management in Practice”, with particular illustrations of his experience in the Taiwan High Speed Rail project. Dr. Kao also served as the Director for the inter-discipline “Railway Technology Research Center” of the University in 2008- 2013.

Taiwan High Speed Rail Cooperation

1997-2008, *Vice President*

Dr. Kao has a long history of involvement in the Taiwan High Speed Rail Project. In 1990, he was involved in the feasibility study of the Project. In 1994, He served as the Advisor to the Provisional Office of the Taiwan High Speed Rail Project.

After the Taiwan High Speed Rail Project was privatized in 1997, he started an 11 year career in participating in the design, construction and operation of the Project. In 1997, he served as the VP/project management in-chargeing the management of the programme, cost, interface and configuration of this 15 billion USD infrastructure project. As the construction activities peaked, his responsibility expanded into managing design and construction contracts of Civil, Station, Depot and Trackworks of the entire railroad. There were totally 1200 professionals from 26 nations directly report to Dr. Kao during the construction stage. He managed 55 international design and construction contracts. There was no single arbitration in his management of these contracts and all his contracts incurred no delay.

During the testing and commissioning stage of the Taiwan High Speed Rail in 2007, Dr. Kao served as the operation preparation task leader to support the commissioning of the railroad.

Eastern Group

1993-1997, *CEO*

Dr. Kao served as the Chief Executive Officer of the Eastern Construction Group. He was directly responsible for the land reclamation and harbor facility construction of the Sixth Naphtha Project. The area of reclamation is 8 km x 3 km with a deep sea harbor of 24 meter depth of water. He conducted the building of the dredgers for the reclamation, and managed of the reclamation and port facility construction. The project was completed with 2 years ahead of the schedule. Eastern Construction was the largest private construction company in Taiwan that time.

Moh & Associates, Inc.

1983-1987, *Vice President, Geotechnical Engineering Department*

In 1983, Dr. Kao served as the Project Manager for the design of the Taipei Railway Underground Project which consisted of 2.3 kilometers of underground tunnels and an underground station.

He also had served as the Project Manager for the Southern International Airport and Kaohsiung International Post Overall Development Project. The projects' objectives were (1) to select the most suitable site for the Southern International Airport and to complete a basic design for the selected area, and (2) to develop a strategic plan for the future development of the Kaohsiung Port.

San Jose State University, California USA

1981-1983, Adjunct Professor

In between 1981-1983, Dr. Kao served as the adjunct professor for the Civil Engineering Department at California State University – San Jose. He taught earthquake engineering and “Computer Application to Geotechnical Engineering”.

PUBLICATIONS

T.C. Kao, Yung- Cheng (Rex) Lai & Mei-cheng Shih “Privatization vs. Public Works for High Speed Rail Project” Transportation Research Record, Journal of Transportation Research Board, ISSN 0361-1981, Volume 2159/2010, Page 18-26, Sept.06, 2010

T.C. Kao, “From Planning to Commissioning - Lesson Learned of Taiwan High Speed Rail Stations” UIC High Speed 6th World Congress on High Speed Rail, Amsterdam, March 2008

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T.C.Kao & C.K.Lin , “Taiwan High Speed Rail & Its Impact to Regional Development” the 4th Asian Civil Engineering Coordinating Council (ACECC) International Conference. June 2007

T.C.Kao, “Land Reclamation in Southeast Asia” 13th Southeast Asia Geotechnical Conference, Taipei, Taiwan. Nov. 1998

T.C.Kao, “A New Method Coastal Land Reclamation” 14th World Dredging Congress, Amsterdam, the Netherlands. Nov. 1995

PROFESSIONAL AFFILIATIONS

Registered Civil Engineer: California, USA

Registered Civil Engineer: Taiwan

