

**For 18 September 2007**

**Legislative Council Panel on Economic Services**

**Report on Ngong Ping Skyrail Cabin Dislodgement Incident**

**Purpose**

This paper informs Members of the findings of the investigation into the falling of a cabin from the cable car system on 11 June 2007 and outlines the rectification and other arrangements to be implemented.

**Background**

2. Since its opening to the public on 18 September 2006, Ngong Ping cable car has received more than 1.5 million passengers in its first nine months of operation. This has already exceeded the average of 1 million visitors per year to the area in the past. The Electrical and Mechanical Services Department (EMSD) has been closely monitoring the operation of Ngong Ping Skyrail as **safety is always our top priority**. It has provided advice to MTR Corporation Limited (MTRCL) and Skyrail-ITM (Hong Kong) Limited (Skyrail) on the operation and maintenance of the cable car system as and when required to enhance its smooth operation and service reliability. During the first nine months of operation, EMSD has conducted regular and random inspections to enforce safety requirements in operation and maintenance for the cableway.

3. There were, however, occasional service interruptions that raised concerns on the reliability of the ropeway system. With advice of the EMSD and in the light of experience, improvements have been made. Before the 11 June incident, the cable car system achieved an overall reliability rate of 98.8%.

4. From 5 to 7 June 2007, Skyrail closed the cable car system in order to facilitate a rope shortening exercise. This is a regular maintenance procedure. Upon completion of the exercise, Skyrail reopened the cable car system for public service on 8 June 2007.

5. Separately, Skyrail commenced a series of tests on 7 June 2007 to satisfy the requirement under the Aerial Ropeways (Safety) Ordinance (Cap. 211) (the Ordinance). Under the Ordinance, the first annual examination of the ropeway has to be completed no later than 14 months from the date of approval to operate, and thereafter every 12 months. In the case of the Ngong Ping cable car system, the first annual examination was due to be completed by 26 July 2007. To meet this statutory requirement, a series of tests had been scheduled during the non-operating hours of the ropeway for about one week to ascertain the effectiveness of different system components.

6. On 11 June 2007, in the course of conducting a brake test, as part of the first annual examination, after the ropeway was closed to the public, a cabin fell to the ground at around 8:00 p.m. In view of the seriousness of the incident, EMSD immediately ordered the MTR Corporation Limited (MTRCL), owner of the ropeway, to close the ropeway, and asked MTRCL to submit a report on the incident. In parallel, the Government also appointed an Expert Panel<sup>1</sup>, comprising two renowned independent overseas experts on ropeway incidents and systems and the Assistant Director of Electrical and Mechanical Services, to —

- (a) identify the cause of the incident (paragraphs 7-10 refer);
- (b) review the management, design, operation and maintenance of the cable car system (paragraphs 11-20 refer) ; and
- (c) identify remedial measures and recommend prerequisite requirements for re-opening of the cable car system for use by the public (paragraphs 21-25 refer).

## **The Incident**

7. According to the Expert Panel's findings, the brake tests conducted in the evening of 11 June 2007 were part of the annual examination of the ropeway.

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<sup>1</sup> The Expert Panel was chaired by Prof. Dr. Gábor Oplatka, past President and Honourary Member of the International Organisation for the Study of the Endurance of Wire Ropes (OIPEEC) of the International Organisation for Transportation by Cables (OITAF), with Prof. Dr. Josef Nejez, Chairman of the Austrian Standards Committee on Ropeways, as Deputy.

The test schedule was set out by the independent surveyor<sup>2</sup> appointed by Skyrail, while the manual operation of the brake system for the test was undertaken by the maintenance personnel of Skyrail. Under normal operation, the service brakes function automatically under computer control. The aim of the test is to ascertain the effectiveness of the brakes by simulating partial failure of the deceleration control.

8. In parallel, the Government has conducted a criminal investigation into the incident. The Government's investigation reveals that a person appears to have contravened Section 23A of the Ordinance, which reads "no person shall wilfully or negligently do or omit to do anything in relation to an aerial ropeway if such act or omission is likely to render the ropeway unsafe for persons using, operating, or being in the vicinity of, the ropeway".

9. The Judiciary served three summonses on 17 September 2007 setting out the following information —

- (a) [name], on 11 June 2007, in Hong Kong, did negligently omit to consult or clarify with the manufacturer of the Ngong Ping Ropeway before [he] performed a brake test in relation to the ropeway which was neither stated nor required in the Operation and Maintenance Manual of the manufacturer of the ropeway and such negligent omission was likely to render the ropeway unsafe for persons being in the vicinity of the ropeway;
- (b) [name], on 11 June 2007, in Hong Kong, did negligently do an act, namely, performing a brake test negligently during the annual examination of the "Tung Chung Cable Car", which was likely to render the ropeway unsafe for persons being in the vicinity of the ropeway; and
- (c) [name], on 11 June 2007, in Hong Kong, did negligently do an act, namely, negligently supervising [his] assistant to perform a brake test during the annual examination of the "Tung Chung Cable Car", which was likely to render the ropeway unsafe for persons being in the vicinity of the ropeway.

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<sup>2</sup> Under the Aerial Ropeways (Safety) Ordinance (Cap. 211), the owner of an aerial ropeway shall ensure that an annual examination is carried out by a surveyor who is registered with EMSD. In the case of Ngong Ping Skyrail, "owner" refers to MTRCL or the operator, Skyrail, under the Ordinance. In the current case, the surveyor was appointed by Skyrail.

10. The case has entered the *sub judice* phase. This is now a matter for the court. Therefore, the Government is not in a position to discuss the case or release any information relating to the cause of the incident. A sanitised copy of the Expert Panel's report is at Annex. Certain parts of this report are removed upon the Department of Justice's advice in order not to prejudice the legal proceedings under the Ordinance.

### **Review of Operation, Management and Maintenance of the System**

11. ***Regulatory regime.*** EMSD exercises regulatory control under the Ordinance to ensure the safe operation of the ropeway. It performs its regulatory functions through approval of design and installation of ropeways to ensure that they comply with safety requirements. Besides, it also specifies the types and frequency of tests and checks, as well as the maintenance schedule to ensure cable car safety. The international experts have confirmed with us that the current regulatory regime is in line with prevailing international practice. EMSD will continue with this framework to ensure the safety of the cable car system.

12. ***Design of the cable car system.*** Having reviewed the Ngong Ping cable car system, the Expert Panel has confirmed with us that the design of the ropeway is in line with the prevailing international standards and practices.

13. ***Previous incidents.*** Since the formal opening of the cable car system, there had been 21 incidents<sup>3</sup> which led to service disruptions. After reviewing the management, operation and maintenance of the cable car system, the Expert Panel considers that of these incidents, three were caused by component imperfection, such as water-proofing enclosure of an equipment item failing to protect the electronic parts from ingress of water; and eleven related to operation issues, including inadequate works co-ordination, poor workmanship, inadequate operation awareness, and unsatisfactory maintenance and stock management. The remaining seven were due to adverse weather conditions and initial system setting. The Expert Panel advises us that these various instances had affected the reliability of the system but did not compromise its safety.

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<sup>3</sup> These incidents exclude the incident on 11 June 2007. They had resulted in suspension of service for 15 minutes to 6 hours 20 minutes.

14. ***On-going improvements.*** During the nine months since the Ngong Ping Ropeway commenced operation on 18 September 2006, EMSD conducted over 130 regular and random inspections, and issued 47 advisory notices on improvement measures identified through these inspections. To ensure prompt and effective implementation by MTRCL and Skyrail, EMSD held monthly meetings with MTRCL and Skyrail to closely monitor the progress. As at 11 June 2007, 42 of these 47 improvement measures have been effectively implemented.

15. In view of the less than satisfactory performance of the Ngong Ping Skyrail, EMSD completed a performance review of the Ngong Ping Skyrail and forwarded its recommendations to MTRCL in January 2007. It urged MTRCL to conduct a timely and independent review of the cable car system with regard to the following —

- (a) design standard, quality and reliability of major equipment/parts and the cable car system as a whole;
- (b) the current operation and maintenance management including fault prevention, recording, diagnosis and recovery procedure;
- (c) performance benchmarking with overseas cable car systems of similar design; and
- (d) improvement measures for minimising service interruption and thus enhancing system reliability.

16. Subsequently, MTRCL commissioned a consultancy review. Findings of the review were submitted to EMSD for vetting on 31 May 2007. EMSD responded with additional suggestions for implementation.

17. The actions to improve the performance of the cable car system mentioned in paragraphs 14-16 above are summarised in the table below —

<b>Date</b>	<b>EMSD's Action</b>	<b>Follow-up Action taken by MTRCL and Skyrail</b>
September 2006 to 11 June 2007	<ul style="list-style-type: none"> <li>conducted 130 regular and random inspections</li> <li>issued 47 advisory notices on improvement</li> </ul>	<ul style="list-style-type: none"> <li>42 out of 47 suggested improvements were completed by Skyrail</li> <li>the remaining five items are in progress</li> </ul>
January 2007	<ul style="list-style-type: none"> <li>completed a performance review of the Ngong Ping Skyrail and asked MTRCL to conduct an independent review of the ropeway</li> </ul>	<ul style="list-style-type: none"> <li>MTRC therefore commissioned TÜV SÜD to conduct an independent review</li> </ul>
31 May 2007	-	<ul style="list-style-type: none"> <li>MTRC submitted the consultancy report completed by TÜV SÜD to EMSD</li> </ul>
8 June 2007	<ul style="list-style-type: none"> <li>responded with additional improvement items</li> </ul>	-
11 June 2007	<ul style="list-style-type: none"> <li>issued a closure order and commenced investigations into the cabin falling incident</li> </ul>	-

18. The Expert Panel has reviewed and endorsed the on-going improvement measures recommended by EMSD before the incident on 11 June 2007.

19. ***Need for further improvement.*** The Expert Panel considers that there is further room for improvement in the management, operation, and maintenance of the cable car system. These include the following improvement measures —

- (a) training for operators and maintenance staff;
- (b) maintenance and operation procedures and work instructions;
- (c) spare parts and materials inventory control;
- (d) planned preventive maintenance;
- (e) quality management;
- (f) human resources management; and
- (g) procurement practices.

20. These improvements will enhance the maintenance and operation of the cable car system. They will help restore public confidence in the Ngong Ping cable car system. In fact, as mentioned in paragraphs 14 and 15 above, many of the improvements have been undertaken by MTRCL and Skyrail in response to problems identified from instances of service disruption. The Expert Panel considers that a more structured and systematic management approach would help ensure a reliable and efficient ropeway operation.

### **Pre-requisites for Re-opening**

#### ***(a) Technical Remedies and Improvements***

21. Upon completion of on-site investigations by EMSD, MTRCL and Skyrail have conducted a thorough inspection of the entire cable car system to identify components, parts and equipment which require repair and replacement. During the service suspension, all damaged and worn components have been repaired or replaced as necessary. To ensure satisfactory performance and rebuild the community's confidence in the system, for the re-opening of the system to the public, the Expert Panel considers that —

- (i) all the repaired or replaced component parts should be certified by the ropeway manufacturer. This is currently in progress;
- (ii) the system should be tested and commissioned as if it were a new build; and

- (iii) a full annual examination of the system in accordance with the Ordinance should be conducted.

22. The Expert Panel also considers it necessary for the ropeway owner to implement a quality management system, such as ISO 9000, to enhance management system and work procedures. This will help ensure a more comprehensive compilation of maintenance procedures and work instructions, proper implementation of a stocking/inventory system for spare parts and provision of continued training to all operation and maintenance staff.

***(b) A New Management Regime***

23. In light of the Expert Panel's recommendations and having reviewed the experience gained in operating the cable car system, MTRCL has informed the Government that it will change the current cable car management. A subsidiary company will be formed by MTRCL to take up the management and operation of the system. The new company will be led by an international management team comprising MTR engineers and experienced cable car professionals. It will strengthen the management approach by implementing ISO 9000 and transferring recognized best practices in safety and quality to further raise professional standards. MTRCL will introduce the new management team to the public when it is in place.

***(c) Retraining of Operation and Maintenance Staff***

24. MTRCL advises us that the new management will keep virtually all existing operation and maintenance staff. They will receive refresher training to enhance their safety awareness and technical competence. Re-assessment of the ropeway staff and qualified technical personnel will be conducted by MTRCL to ensure the quality of the workforce. They will be further evaluated by EMSD.

***(d) Rigorous Trial Run Programme***

25. After the above process has been implemented and MTRCL has demonstrated to EMSD that the cable car system is safe and robust, EMSD will require the system to go through a comprehensive dummy load test for at least 7 days, achieving a reliability level of 98% or above. Only upon satisfactory completion of the dummy load test will MTRCL conduct trial runs.



26. The transfer of management control, re-testing of the ropeway, staff re-assessment, a comprehensive dummy load test and trial runs will take some time. MTRCL will announce a re-opening date for commercial operation after all aspects of the recovery programme have been satisfactorily completed and it has obtained the requisite statutory approval from EMSD.

### **Ngong Ping Village, Trade and Community Engagement**

27. The Government understands the difficulties that the tenants at the Ngong Ping Village have faced during the cable car suspension period, and has urged MTRCL to continue to liaise closely with Ngong Ping Village tenants by arranging further rental concessions and promotions. MTRCL will also work jointly with Hong Kong Tourism Board and the travel trade in re-establishing Ngong Ping 360 as a popular tourist attraction.

28. Members are invited to note the series of measures the Government and MTRCL, as owner of the system, will take to ensure smooth re-opening of the cable car system and rebuild its popularity as a must-visit tourist attraction in Hong Kong. We will keep Members, concerned parties and the general public informed of progress made in implementing these measures.

Commerce and Economic Development Bureau  
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