

## **Technical Report on Lift Incident on 11 January 2009**

### **at Heng Shan House, Heng On Estate, Ma On Shan**

#### **Introduction**

In the evening of 11 January 2009, at around 21:00 hours, Lift No.7 at Heng Shan House, Heng On Estate, Ma On Shan stopped on the 24th floor and 5 passengers were trapped. Fire Services Department and the Registered Lift Contractor, Otis Elevator Company (H.K.) Limited (Otis) were called for the rescue. The passengers were released on 24th floor by the firemen with the assistance of Otis's staff. No person was injured in this incident. EMSD was informed of the incident and carried out investigation on the same date.

#### **Background**

2. The lift was installed in 1986 by Otis. It is driven by an electric motor with rated speed at 2.5 metre per second (m/s) and rated load at 1,250kg. It serves the 35 storey building with stops at every 3 floor interval (namely G/F, 3/F, 6/F, 9/F ..... 33/F). From 1986 to March 2001, the lift maintenance was under the management of the Housing Authority. From 1 April 2001, the management of the lift was transferred to the Incorporated Owners of the Heng On Estate. As a result, the lift came under the control of the Lifts & Escalators (Safety) Ordinance (the Ordinance), Chapter 327 of the Laws of Hong Kong.

3. The maintenance of the lift has been provided by Otis since 1986. The last periodic examination of the lift was conducted by a Registered Lift Engineer (RLE) of Otis on 16 December 2008, and the lift was certified to be in a safe working condition.

#### **Investigation and Findings**

4. Inspection by EMSD confirmed that one of the four suspension ropes had broken. One end of the broken rope was found entangled at the car door top on 24/F

(see Figure 1 in Appendix A). Another end of the broken rope was found hanging inside the lift shaft (see Figure 2 in Appendix A). No other damage of the lift component was observed. (see Figures 3 and 4 in Appendix A).

5. The breakage of the rope was detected by the safety device of the lift which immediately stopped the operation of the lift.

6. As part of the investigation, an independent expert was engaged to conduct laboratory examinations and tests on the broken rope to ascertain whether the tensile strength of the rope was in compliance with the manufacturer's technical specification. The test results showed that the rope met the manufacturer's technical specification of 66.6kN in tensile strength. The failure was due to lack of effective lubrication at the inner part of the ropes, resulting in damage to the wire rope strands through rubbing action between the strands. This damage led to deterioration of the strength of the rope which eventually resulted in tensile overstressing failure of the rope.

### **Remedial Action**

7. All the suspension ropes of Lift No. 7 were replaced by Otis and the lift was put back in operation after the examination and certification by a RLE of Otis on 9 February 2009.

### **Follow-up Action**

8. EMSD is seeking the Department of Justice's legal advice to find out whether there are any persons or parties liable for the incident under the Lifts & Escalators (Safety) Ordinance. If there is sufficient evidence showing that there are persons/parties liable, EMSD will take necessary legal action.

Electrical & Mechanical Services Department

10 February 2009

Appendix A - Photos



Photo 1 – Broken rope hanging on the lift car door at 24/F.



Photo 2 – Broken rope hanging inside the lift shaft.



Photo 3 – No damage found on the main drive.



Photo 4 – No damage found from the counterweight.