A REPORT ON A ONE-DAY SEMINAR ON "VERTICAL TRANSPORTATION"

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This one day seminar on Vertical Transportation, organised by the Building Services Technical Division on the 11 November 2003 which centred on Elevator Traffic Analysis and Modernisation attracted the attendance of 38 engineers and elevator practitioners.

So, what is traffic analysis and what are the benchmarks used for a cost effective design?

Elevator traffic analysis, according to the first speaker, Mr. H.J. Khor, Managing Director of Pernas Otis Elevator Co Sdn Bhd, is a set of procedures for selecting the proper number, type, speed and arrangements of elevators to satisfy the required service criteria. Present day technology advancement has contributed significantly to elevator traffic analysis whereby traffic analysis can now be done easily with computer software programs.

Essentially, there are two basic factors to be considered in elevator traffic analysis i.e. population and traffic pattern.

In estimating the population, the commonly used approaches would be to consult the building owner and architect or to base figures on densities of similar or comparable buildings. Alternatively, one may also estimate by analysing the usable floor area of the building.

The various traffic patterns that need to be considered are:

- Incoming (up) peak
- Outgoing (down) peak
- Two-way traffic
- Counterflow traffic
- Interfloor traffic
- Recommended speeds

TABLE 1: GENERAL BENCHMARK OF CAR SPEEDS FOR OFFICE BUILDINGS

Building Height (floors)	Elevator Car Speed (M/s)
Up To 5	1.00
6 – 10	1.50 – 2.00
11 – 15	2.50
16 – 25	2.50 – 3.50
26 – 35	5.00
36 – 45	5.00 – 6.00
46 – 55	6.00 – 7.00

Table 1 shows a general benchmark for elevator car speeds for use in elevator traffic analysis.

To ensure better and more efficient traffic movement, avoid if possible:

- having an eating facility on an upper floor,
- having public areas (banking hall, ballroom, stock trading floor, etc.) on an upper floor,
- passenger elevators serving basement floors,
- multiple lobby floors, and
- passenger elevators serving car park floors above the main lobby.

A number of recommendations is summarised in Table 2.

Mr. Khor concluded that traffic analysis involves estimation, assumptions and judgement of key elements or contributing factors such as population, traffic pattern and car percentage loading. These factors, however, depend heavily on human behaviour. Thus, he cautioned that traffic analysis results can be used to recommend a cost effective solution, but should not, however, be used to guarantee performance.

The afternoon session on Modernisation: Upgrading Your Lift Performance the Cost Effective Way was delivered by the second and third speakers, En. Raghib Fasih Azmi and Mr. Cheong Kuan Meng who are the Director of New Equipment and the Modernisation Manager, respectively, of Pernas Otis Elevator Co Sdn Bhd. The speakers highlighted that an outdated elevator is potentially unsafe, unreliable and may cause a building to lose its appeal and value. Under such circumstances, the normal and most logical solution that will first come across one's mind would be to embark on a complete replacement

TABLE 2: ELEVATOR TRAFFIC ANALYSIS: SUMMARY OF RECOMMENDATIONS			
KEY FACTORS	**TYPES OF BUILDING**		
	Office Buildings	**Hotels**	**Apartments**
Population	• Floor areas	• Number of rooms	• Number of bedrooms
Traffic Conditions	• Morning up: normally prime determinant • Noon two-way • Evening down	• Morning down • Evening two-way: normally prime determination	• Two-way
Quality of Service	• 30 sec intervals • 20-25 sec waiting times • 150 sec system service time	• 35-45 sec intervals • 25-30 sec waiting time • 180 sec system service time	• 45-90 sec intervals • 30-60 sec waiting time • 240 sec system service time
Quantity of Service	• 10% - 15% up handling capacity	• 6%-9% two-way handling capacity	• 5% two way handling capacity

of the elevator. While a complete replacement may be a perfect solution, it is however, costly, messy and disruptive to the operation of the building. Modernisation is the alternative solution to the problem.

In its simplest form, elevator modernisation refers to the process of injecting new, extended life into one of your most critical and valuable assets (i.e. your elevator) in order to achieve improved reliability, technology enhancement, safety reassurance and asset protection.

The key elements that one can expect to achieve from an elevator modernisation exercise include improved reliability, reduced waiting times, improved leveling accuracy, a new look, improved ride comfort, shorter down times and it is a cost effective solution.

Finally, the speakers informed the audience that since major components in the elevator system such as the guide rails, car platform and frame, counterweight and machine can be retained, the modernisation approach is definitely more cost effective. In short, modernisation enables you to beat the obsolescence of an outdated elevator without being unduly burdened with the cost and disruption to building operation in the case of complete replacement.

At the conclusion of the seminar, mementos were presented to the speakers for their invaluable contribution and support for IEM. ■