

Use and Abuse of Elevators

by William Rebello

Elevators are one of the most important pieces of equipment in buildings. Where would the construction industry be if elevators were not invented? Thanks to Elisha Otis, metro skylines are growing taller by the day. Unfortunately, the people who purchase elevators are not the end users and do not realize that they are handing over a secondhand product to those users.

Historically, elevators were considered a luxury. Once installed, they were kept shut down until the building was completed. In contrast, in mid- and high-rise construction projects today, the project personnel pressure the elevator contractors to complete and hand over the elevators so they can be used to transport construction materials throughout the building. At this stage, the buildings are partially completed. Under such conditions, elevator life gets reduced much faster than an elevator in an already-completed building.



Figure 1



Figure 2

Elevators can often go out of order due to voltage fluctuations at construction sites. The power supply at construction sites is temporary and used by various agencies (e.g., tower crane, fabrication work, etc.) resulting in voltage fluctuations. The high and low voltage frequencies affect the functioning of electronic parts in the controller and can damage equipment or reduce its life.

Buildings under construction require a lot of water for cement, painting and flooring purposes. When this water enters the lift shaft, equipment can rust, despite attempts to protect it. Some say the rusted parts can be painted but do not realize some parts cannot be painted. Failure of these critical parts can cause the elevator to malfunction, resulting in frequent breakdowns. Simultaneously, corrosion of the electrical contacts can occur.

This problem may continue for years even after the water has evaporated.

Continued



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Figure 3



Figure 5

A non-technical person may find it difficult to understand. One might think that once the water dries, the problem is resolved. However, water can enter through machine-room windows during such weather as monsoons, because the windows are not protected during construction of the building. Care is also not often taken when fire equipment is being tested. For example, fire hydrants are sometimes opened, and the water can enter an elevator shaft from the landing. Such a situation can result

in short circuiting of electrical contacts and lift landing doors, and the lift may operate with the doors open.

A 31-year-old Indian construction worker was killed in an elevator while working on a construction site in Kuwait City, Kuwait. Conflicting news reports from the *Arab Times* and *Emirates 24/7* claim the man was either decapitated by a falling elevator when he opened the elevator door, or standing inside the cabin when the doors quickly closed around his neck and the car dropped suddenly. According to the *Arab Times*, construction work is considered the most hazardous occupation in Kuwait, resulting in a high percentage of fatalities and injuries.

Construction sites are also exposed to a lot of dust. This gets into the lift shaft and settles on the electromechanical contacts, also causing the lift to malfunction. When debris is taken into the elevator, it gets into the groove of the sill and electromechanical door contacts. This results in either the lift doors not being able to close or even if the doors close fully, due to dust gathering on the door lock contacts, the circuit does not get completed, and the lift does not start.

In a partially occupied building, workers and tenants begin moving furniture and other equipment into the building. This damages the equipment, which inconveniences the end users. The most effected are those who occupy the building first, because they have to share the lift(s) with the building material and construction workers. This is also one of the reasons why new lifts often go out of order. The builder and elevator company are generally blamed for supplying a secondhand lift, when the fact is that new lifts go out of order due to improper use.

The finishing of the lobby is done only when the building is almost complete, at which point the designers and/or architects have not yet finalized the design. If the lobby finishing is done at this stage, the flooring and/or finishing will get damaged, which is why it is kept for last. When this activity is done at a later stage, water from cement may get into the lift equipment, causing severe damage to equipment that must be replaced, not repaired. The electronic equipment in the machine room and lift shaft will be damaged if water gets into any equipment area.

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Figure 4

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Figure 6



Figure 7

An elevator is comparable to any piece of equipment or personal property. Those involved with construction projects must recognize this and take utmost care so equipment does not get damaged. When people purchase new cars or homes, they are often concerned about potential hazards and damage and, therefore, pay attention to the care of the equipment. Elevator equipment should also be treated with the same level of care and attention.

Though elevator walls are protected with masking or makeshift walls, they are not fully scratch proof, and the ceiling is not protected. Once an elevator wall is damaged or scratched, it cannot be rectified completely unless it is replaced. During the construction of buildings, elevators are often not used properly. Once the building is completed, the end user starts occupying the premises and using the equipment. However, minimal care is given to it. Some buildings have a lift operator who cleans the opening area of the door; however, the remaining area is unattended.

So, how does this problem get resolved? A SAFE temporary elevator can be installed in one on the shafts where all the entrances are barricaded with full-height barricades and locked and can only be opened from the inside. (However, this is not

advisable.) A better option would be installing the temporary elevator (preferably the service lift) with the existing materials but with temporary interior equipment and fixtures that can be replaced with new ones as needed at the final stages of the project. This temporary lift must be maintained and serviced by the elevator contractor installing the new lifts in the building. These lifts can be used for transporting passengers and light materials. Logistics of the temporary arrangement should be worked out during contract agreement and signing.

A rack-and-pinion lift can also be installed outside the building to transport passengers and materials. This lift should not be dismantled until the building is at the final stage of completion. This type of elevator still needs to be maintained like any other type of equipment. Since the installation is outside the building, it is exposed to dusty surroundings, but if maintained properly it will function with minimal problems. Floors where the lift stops should be properly protected and barricaded to prevent accidents. These types of lifts should strictly be operated by trained people. Rack-and-pinion lifts have the necessary safety features and will function properly if regularly maintained by the supplier. 