

Maintenance of Lifts & Escalators and the impact of load shedding

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Background

- Escalators – No local manufacturing and historically imported
- Passenger & Passenger Goods Lifts
 - Current market +/- 90 % of lifts are imported with the majority coming from China
 - Assembled in S.A and installed according to SANS Standards
- Hoist - Historically, hoists (Goods Access Only Lifts) been manufactured in South Africa and is still the current case.

Use to be manufactured & installed under the DMR17 (Driven Machinery Regulation). Hoist installed prior to 2015 require to comply to minimum requirements as set out in Government Gazette No. 40594. Hoist installed since 2015 need to comply to the Published Standards

- Users / Landlord contract Service providers to maintain lifts and escalators



Lifecycle of lifts and escalators

- Norm for life cycle is +/- 20 Years based on current units supplied
- Following contributing factors:
 - Spares availability
 - Technology
 - Safety
 - Usage according to original design
 - Wear and tear
 - Environment exposure
 - Maintenance according to manufacturers requirements.
 - Technicians training on current technology



Regulation

- Definitions _

“**lift**” means any permanent or temporary lifting installation used for the conveyance of persons or of persons and goods, or as an access goods only lift (hoist), that operates by means of a conveyance or platform running on a fixed guide or guides and serving landings, (This include escalators & travelators) but does not include a hoist worked by hand power or a material hoist;

7.__(1) The user shall designate a **competent lift service provider** to examine and maintain a lift, escalator or passenger conveyor **at least once a month** or at such longer intervals as may be prescribed by the manufacturer of such lift, escalator or passenger conveyor: Provided that an inspector may prescribe such examining intervals as he or she may deem necessary. (SLA need to be in place)

“**Competent lift service provider**” means a person that employs competent lift mechanics and a competent operator, or a competent lift mechanic who is self-employed and who undertakes to contract with the user of a lift, escalator, passenger conveyor to perform maintenance, examinations and tests in terms of regulation 7;



Competent lift mechanic (Qualified technician)

- “competent lift mechanic” means a person who-
- has completed a learnership or an apprenticeship in the trade of lift mechanic;
- has completed an electrical or mechanical trade qualification and has had at least one year post qualification general practical experience on lifts; or
- has obtained a minimum of a NQF level five electrical or mechanical engineering qualification, and has had at least one year post qualification general practical experience on lifts;

Lift service require

Regulation require:

- Agreement to be in place with a service provider (SLA)
- Monthly service visits (unless otherwise approve via exemption for particular lift and site)
- Locks and safety circuit to be inspected on each service visit.
- Six (6) Monthly rope inspections
- Twelve (12) month interval for safety gear system test
- Twelve (12) month interval for buffer system system test
- Competent lift service provider to report the user / landlord to the DoEL should the lift and/or escalator operating without a **valid** comprehensive report. (Referred to an Annex B...)

Service environment

- Unlike a vehicle that the service that is done in a mechanical shop, lift technicians need to travel to the various buildings in their allocated set route.
- This means that the technician need to travel with the ~~union~~-agreed minimum required tools to ensure they have the means to service, clean, small adjustments and sometimes also repairs.
- Some areas are safe to travel, and some areas are not so safe areas.
- Most service companies, the service technician also need to attend to their own call outs.
- Most repairs (especially multi nationals) are done by sub-contractors

Service operations

- Most service companies now use modular based maintenance procedures to perform their “monthly” maintenance. This means that the technician have prescribed instructions of what he need to check, clean, lubricate & small adjustments for that particular month. This is to ensure that over some cycles all the areas of the lift / escalator is attended to.
- Number of lifts / escalators can vary from +/- 80 to 110+ units per month and vary from company to company and also other variables like high rise, area geographics (distance between lifts), some mines have 2 weekly interval services.
- Most companies use one (1) technician to perform monthly maintenance. Something that need to be kept in mind is some lifts are designed for single man maintenance and the older lifts are designed for two-man maintenance and will require coordination to ensure when two-man operations is required for that month, that a assistant or second technician is arranged
- Lift companies have to operate in accordance with the maintenance standards SANS 53015 (DoEL busy with implementation)
 - Requirements
 - Dedicated call center
 - Processes and policies
 - Service methodologies & spares
 - Record keeping
 - Employ qualified people and sufficient resources
 - Maintenance instruction
 - Risk assessments according to service tasks
 - Safety protocol

Impact of load shedding on the lift industry



- ESKOM..... a reality that definitely have an impact on the lift industry. There are various types of power interruptions – Load shedding, load rotation, power failures due to electrical infrastructure failing that can not handle the power interruptions because the network was not designed for continuous on / off power. Floating Neutrals and phase swapping, all contributing direct or indirectly because of the current ESKOM state.
- Due to areas that are affected, this directly impact on the time the lift service technician to perform his monthly maintenance.
- People getting stuck in elevators
 - Trauma
 - Fatal incidents and injuries where people tried to rescue themselves not being able to wait for a technician.
 - Traffic grid-locked because of traffic lights out of order and technicians not being able to get to the “occupied” call outs in time. Some time up to two hours in CBD’s to get to people
 - Vandalism due to frustration being stuck in the elevator and more so for the duration of being stuck
- People having to hold on to the escalators handrails when suddenly the escalator comes to a stop
 - Loosing their balance and falling down
 - Dark areas (no natural light) that are out even for a couple of minutes mean people tripping

Managing maintenance “time”

- Lift companies have to consider planning around loadshedding planned downtime.
 - Planning maintenance with neighboring routes where the power is not affected for the said time slots. Challenging but need to come up with managing solutions to ensure maintenance is done and not neglected.
- To engage the regulator to consider three monthly maintenance visits that allow more time for maintenance and reduce traveling time.



Equipment SAFETY failure due to power issues



- Lift emergency brake release (depending lift type), light, alarm and intercom batteries not designed for the amount and duration of power failures experienced. This means situations where:
 - People stuck in the lift in the dark
 - Technician not being able to rescue people because the battery for the emergency brake release failed
 - Intercom and alarms don't work which means people not being able to call for assistance
 - Building not paraplegic friendly unless equipped with a generator

Maintenance impact due to load shedding



- Technicians require the lift / escalator to have power (electricity) and be in a running status in order to perform the required maintenance. Less time means that not all the equipment can be maintained and keep in mind the amount of units the technician have to attend to maintenance withing a specific month.
- Reality of maintenance not being performed as it should due to Eskom direct or indirect failure:
 - Lift / escalator equipment failure
 - Life cycle of the equipment affected
 - Safety circuits can not be checked as it should
 - Attending to call outs due to load shedding means even less time to maintain
 - Safety of elevators and escalators in general will be compromised and incidents are already happening directly linked to load shedding related problems

Equipment failure due to loadshedding, may it be direct or indirect.



- Batteries of various devices on the lifts
 - Emergency devices
 - V- Ram memory back up on software equipment
- Surges (grid switching and generator switch overs) that cause damage to equipment
 - Variable Voltage, Variable Frequency drives “V3F Drive” (Cost R80K to R190K depending on type and size of the VSD).
 - Lift controller hardware, especially power supplies
- In general this boils down to SAFETY risk and great cost to the user and the service provider

Managing lifts and escalators during load shedding

- Monitoring load shedding schedules and preventing the lift from operating 10 min before to 10 min after (power back on) load shedding occurred.
- ARD's (Automatic Rescue Drives) – Not a legal requirement but will assist with should the lift get stuck due to loadshedding (or power interruption in general) to then engage at level the lift to the nearest floor in order to allow the occupants to evacuate and then switch off.
- Frequent check that emergency devices like alarms, intercom's, ARD's (if installed) is working by simulating power interruptions to ensure batteries are in order.
- Generators
- On-line UPS + Generator
- Ripple relay technology.
- Power surge protection

CLOSING

- Thank you

