Recent wind towers installed in South Africa, indicate approximately 100-m travel to be the new norm. Towers are however likely to reach even higher in coming years to meet the local geographic requirements. This will improve the flailing power production, but reflects heavily on the service technicians who must climb the towers to service the power-generation equipment. Although safety ladders with fall protection are mandatory in the towers, it becomes very difficult for these technicians to climb the ladders with say a 25kg toolbox. The towers should therefore have a user-friendly ‘service lift’ that makes it safer, easier, and faster for the technicians to get up and down these wind-turbine towers to service the power generation equipment. Obviously these passenger-carrying lifts must be approved by DoL as they are ultimately responsible for enforcing occupational safety in South Africa.
By Eugene Ferreira  
MSc.(PMI), Pr Techni Eng, Reg Lift Inspector

It is important to understand that there are two separated regulations applicable for Lifts and Suspended Access platforms when it comes to wind-turbine tower lifts. Whereas we are all conversant with SANS 1545:1, the OHS Act also refers to Suspended Access Equipment in SANS 10295-1.

Suspended access equipment (SAE) is classified into two main categories, namely:

a) permanent systems; and  
b) temporary systems.

Permanent systems are known as building maintenance units (BMUs), whilst temporary systems are known as temporary suspended platforms (TSPs). A BMU comprises a work platform suspended from steel wire ropes from a roof rig or from some other form of permanently installed support system specifically designed for this purpose. The platform is raised and lowered by one or more hoists. The roof rig or support system may be statically fixed onto the building structure or could be designed to move along a predetermined route on the building.

A BMU is permanent-assembly designed to provide a safe working platform that gives access to areas of a permanent structure and to serve only that structure, although parts of the installation may be demountable for storage purposes. In certain cases, permanent systems are supplemented by the use of TSPs. When TSPs are used in conjunction with BMUs, the TSPs should comply with requirements of SANS 51808 and with this part of SANS 10295.

The definitions for Lifting Machines, Suspended Access Platforms & Lifts

DMR 18 “lifting machine” means a power-driven machine which is designed and constructed for the purpose of raising or lowering a load or moving it in suspension, includes hoist, crane, lift truck or jib-crane, but does not include an elevator, escalator, goods hoist or builder’s hoist;

Lift Escalator & Passenger Conveyer Regulations : "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, that operates by means of a conveyance or platform running on a fixed guide or guides and serving landings, but does not include a hoist worked by hand power or a material hoist;

1545-5 Service Lift:  This is 'lifting equipment' that serves defined landing levels, comprises a car whose interior is accessible to goods and persons on account of its dimensions and means of construction, and that runs at least partially between rigid vertical guide rails or guide rails whose inclination to the vertical does not exceed 15° ...

NOTE 1:  To satisfy the condition of accessibility to the car, the car dimensions should exceed:

a) for floor area, 1,0 m²;  
b) for depth 1,0 m; and  
c) for height, 1,2 m.

NOTE 2:  Since a service lift may carry passengers and goods, it should comply with the requirements of SANS 1545-1 or SANS 1545-2. When lifts of the above size requirements do not carry passengers, they should comply with this part of SANS 1545.

It therefore becomes clear that Access platforms falls under Lifting Equipment DMR 18 and LIFTS under LEPC Regulations

The first question that arises when confronted with a new wind-turbine tower ... “What vertical transport is required to be installed (Sere Wind Farm) - An access platform or a Lift?

We firstly have a look at the URS and the specific requirements of what was specified / required? Do you remember the first tenets of engineering equipment that we were taught years ago?

• Is it properly designed?  
• Is it properly manufactured and installed  
• Does this equipment installed serve the purpose for our needs??

(Below information for your ease of reference)

With reference to the Occupational Health and Safety Act Driven Machine Regulation 18 ...

DMR 18: Lifting machines and lifting tackle -

(1) No user shall use or permit the use of a lifting machine unless …

(a) it has been designed and constructed in accordance with a generally accepted technical standard;

(b) it is conspicuously and clearly marked with the maximum mass load which it is designed to carry with safety: Provided that when this mass load varies with the conditions of use a table showing the maximum mass load with respect to every variable condition shall be posted up by the user in a conspicuous place easily visible to the operator; and

(c) it has at all times at least three full turns of rope on the drum of each winch which forms part of such a machine when such a winch has been run to its lowest limit, and which is controlled by automatic cut-out device. This subregulation(19.1.C) does not apply to Capstan type winches.

(2) The user shall, ensure that every power-driven lifting machine is fitted with...

(a) a brake or other device capable of holding the maximum mass load should the power supply fail, or which is such that it will automatically prevent the uncontrolled downward movement of the load when the raising or lowering effort is interrupted; and

(b) a limiting device that it will cause the driving effort to be automatically arrested when ...

(i) the hook or load attachment point of the power-driven lifting machine reaches its highest and lowest safe position; and

(ii) the load condition is greater than the rated load condition of such machine.

(3) The user shall cause every chain or rope in the load path of...
This service lift from Avanti Wind Systems (seen right) has a 533-lb contract load capacity, enough for two technicians and their tools. To minimize welds for lift guides, the two wire ropes (on the backside of the blue cage), are tight enough to maintain the lift’s stability. The company says it has produced and installed more than 16,000 of these service lifts in wind-turbine towers worldwide.

Several countries have required that these service lifts in wind-turbine towers meet the same requirements and standards as for the elevators in buildings. Therein lies a problem. “It’s not possible,” says Avanti Wind System’s General Manager Kent Pedersen, “for example, there are a lot of welds in elevators and elevator shafts in buildings. In a wind-turbine tower, however, the lift is cable driven and guided because the tower must have as few welds as possible for the sake of its safety and structural complexity, swaying with extreme winds.”

This is one reason why members of National Association of Elevator Safety Authorities (NAESA) from several countries attended a recent seminar regarding safety of service lifts in wind-turbine towers. The purpose of the seminar was to introduce elevator inspectors to the wind industry and expose the wind industry to existing and new elevator compliance. More than 40 certified elevator inspectors are reported to have participated.

These ‘Service’ lifts, sometimes called work-cages because technicians occasionally work from them inside the wind-turbine tower, also providing safe and fast access to the top of the tower.

Currently, several USA states follow rules that say an elevator inspector must first give official approval before a service lift is used in a wind tower. “Consequently, it’s important for inspectors to know the safety considerations and training that we provide for our lifts and ladders,” says Pedersen, “they should know the difference between an ordinary elevator in a building and the details of a service lift in a wind tower,” he says.

Safety ladders and service lifts are designed to work well together in turbine towers, each providing support for the other. Requirements for service lifts in wind turbines however vary from state to state, requiring a new national standard. (Released 2013/4). Once adopted, the new standard ensured the same requirements nationally in the USA.

The incoming standards were a big part of the discussions and presentations at the seminar, with all states requiring an approval of every service lift before it is put into use. The lift must be tested by a certified inspector and it must be inspected at least once a year like other safety equipment in wind-turbine towers. This is endorsed by lift manufacturers such as Avanti Wind Systems.

Anyone therefore working in wind-turbine towers in South Africa, should meet the safety rules issued by authorities and owners of the wind farm.

Adapted from a published article by Kent Pedersen of Avanti Wind Systems. www.avanti-online.com
WILL THORIUM POWER BE CHEAPER THAN WIND POWER?

January 21, 2015 - Paul Dvorak (Adapted)

Most commentary on energy is really a commentary on the cost of energy. For instance, stories about natural gas rave about its low price, which it has. Bloomberg reports, for instance, that the natural gas price on January 19th was $2.99/ million BTUs. For comparison, the British pay about $8/ million BTUs. Stories about hydrogen-powered electric generators in Japan report the refrigerator-sized units will cost about $16,700 per home. Many articles on gasoline report that the fuel costs less than $2/gallon at many locales. And wind critics loved to bash the now-expired Production Tax Credit because, they say, it was costly. (It was not. It was a tax credit.) They even calculate bogus million-dollar costs to show how much tax payers are supposedly losing.

One way to answer the cost-question is to Google it. A recent search pulled up this edited ‘Best Answer’ from Yahoo: Japan thinks it can make a thorium prototype reactor for $300 million. The UK estimates that the first thorium production plant would cost £1 billion. France has invested €1 million investigating corrosion problems found when a test reactor in the U.S. was shut down in 1969 after only four years of operation. Generally, it’s believed that $300 million would be enough for small thorium power plant … Still megabucks!

Another way to get a handle on thorium-reactor costs would be to examine the cost of current conventional reactors under construction, such as the Vogtle units in Georgia. Whichever way you look at it, we are talking megabucks.

Now add to this equation by ESKOM’s costs in South Africa for our conventional coal-fired power stations. Eventually somebody has owned up over the past week’s news, by blaming poor maintenance for the current precarious cost-position and equally precarious load-shedding!

Surfing Wikipedia, it becomes abundantly clear that for the foreseeable future, wind-turbine power generation is the cleanest and most cost-effective. Wind-farms arising all over the world bear mute testimony to this maxim. Here’s hoping that South Africa follows suite instead of waiting on a miracle from ESKOM!

You decide for yourself!

See the latest news - Click below ...

http://www.windpowerengineering.com
a lifting machine to have a factor of safety as prescribed by the standard to which such machine was manufactured. Provided that the absence of such prescribed factor of safety, chains, steel-wire ropes and fibre ropes shall have a factor of safety of at least four, five and ten respectively, with respect to the rated carrying capacity of the lifting machine.

(4) The user shall cause every hook or any other load-attaching device which is the load-path of a lifting machine to prevent accidental disconnection of the load under working conditions cannot take place.

(5) a) The user shall cause the whole installation and all working parts of every lifting machine as well as ancillary lifting equipment used with the machine, excluding lifting tackle, to be thoroughly examined and subjected to a performance test, as prescribed by the standard to which the lifting machine was manufactured, by a registered Lifting Machinery Inspector appointed by a registered Lifting Machinery Entity who has knowledge of the erection and maintenance of the type of lifting machine involved or similar machinery and who shall determine the serviceability of the structures, ropes, machinery and safety devices, before they are put into use following every time they are dismantled and re-erected, and thereafter at intervals not exceeding 12 months:

Provided that in the absence of such prescribed performance test, the whole installation of the lifting machine shall be tested with 110 percent of the rated mass load, applied over the complete lifting range of such machine and in such a manner that every part of the installation is stressed accordingly.

(b) Notwithstanding the provisions of sub regulation 5 (a), mobile cranes are excluded from the performance test after each re-deployment.

(c) No user shall use or permit the use of temporary suspended access platform installation unless it complies with a safety standard with respect to its construction, installation, operation and inspection incorporated for this purpose into these regulations under section 44 of the Act.

(6) Notwithstanding the provisions of sub regulation (5), the user shall cause all ropes, chains, hooks or other attaching devices, sheaves, brakes and safety devices forming an integral part of a lifting machine to be thoroughly examined by a person who has a knowledge and experience of the erection and maintenance of the type of lifting machine involved or similar machinery at intervals not exceeding six months.

(7) Every user of a lifting machine shall at all times keep on his premises a register for a period of ten years in which he shall record or cause to be recorded full particulars of any performance test and examination prescribed by sub regulations (5) and (6) and any modification or repair to the lifting machine, and shall ensure that the register is available on request for inspection by an inspector.

(8) No user of machinery shall require or permit any person to be moved or supported by means of a lifting machine, unless such machine is fitted with a man-cage designed and fabricated according to an approved SANS standard and a risk assessment has been done.

(9) No user shall use or permit any person to use any power driven lifting machine unless it is provided with ...

(a) a load indicator which will indicate to the operator of the power driven lifting machine, with a lifting capacity of greater than 5000kg of the mass of the load being lifted.

Provided that such a device shall not require manual adjustment, from application of the load to the power driven lifting machine until the release of that load, using any motion or combination of motions permitted by the crane manufacturer to ensure safe lifting; power driven lifting machines manufactured or refurbished prior to the publication of these regulations shall be deemed to comply with these regulations and ...

(b) a load limiting device which will automatically arrest the driving effort whenever the load being lifted is greater than the rated mass load of the power driven lifting machine, at that particular radius, using any motion or combination of motions permitted by the crane manufacturer to ensure safe lifting; Provided that such a device shall not arrest the driving effort when the power driven lifting machine is being operated into a safer condition.

(10) No user shall use or allow the use of any lifting tackle or lifting device unless the following conditions are complied with, namely that ...

(a) every item of lifting tackle is well constructed of sound material, is strong enough and is free from latent defects and is in general constructed in accordance with a generally accepted technical standard;

(b) every lifting assembly consisting of different items of lifting tackle is conspicuously and clearly marked with identification particulars and the maximum mass load which it is designed to lift with safety;

(c) lifting tackle have a factor of safety with respect to the maximum mass load they are designed to lift with safety according to the incorporated SANS standards;

(d) steel-wire ropes are discarded and not used again for lifting purposes if the rope shows signs of excessive wear, too many broken wires, corrosion or other defects that have made its use in any way dangerous, as per incorporated SANS standard;

(e) such lifting tackle is examined at intervals not exceeding three months by a person, appointed for this purpose, who by virtue of his training and experience of lifting tackle, shall record and sign results of such examination;

(f) such lifting tackle is stored or protected so as to prevent damage or deterioration when not in use.
ASCENDING vs DESCENDING STAIRCASES

Most of us were impervious to sports injuries from our teens to the thirties. It was only after the fifties that our bodies started to protest against 'physical abuse', as my physiotherapist calls it. The availability of knee and hip replacements have come to the fore with the recent technological medical development in prostheses. According to medical research, running up stairs two or three at a time is bad enough, but the worst damage that you can inflict on yourself is running down stairs because of the negative impact on your knee joints.

It was only after a very recent knee replacement, that I became aware of seven immediate family and friends that have had hip and knee replacements over the past twelve months, with a further four due for knee replacements now in the New Year. Granted that 50% of these persons were over fifty, where the physiological definition of osteoarthritis came into the definition. Trust me, you do not want to challenge your body’s pain threshold to ten-tenths! It was certainly the most excruciating pain that one can ever endure … and not just for a few days … for WEEKS!

Cost also enters the equation, since the medical aid societies do not cover your ‘contracted-out’ specialist surgeon’s fees. So budget for an additional personal R30 to R40 000 contribution.

Last but not least, do not discard the possibilities of post-operative complications which prolong your recovery, adding to your pain threshold pressurize’s your medical bills. A full recovery reputedly takes anything between six to eighteen months!

Prevention is therefore better than cure!

WIND-TURBINE TOWERS

Researching the latest wind-turbine towers installed in the Netherlands, the above photo is but one of a plethora of representations. Regrettably there was no data with the photo other than its geographical position. We were endeavouring to establish propeller diameter, overall tower height and diameter, and of course … power generation statistics.

Looking at the above photo, one can only surmise the narrow confines of the ‘passenger lift’ installed inside the shaft, although by comparison, the photos in this issue of Educom appear to have adequate space for installation. Technically, the fact that stands out most for us, is the ‘fixing’ of the lifts by steel wire ropes as opposed to solid guide fixings. These turbine towers according to Google, sway as much as 600mm over 100m in extreme wind conditions, which obviously has to be designed into the manufacture of these towers.

I specifically remember the Hillbrow Micro-wave Tower with the motor room at 197m, where Hans-Peter Burri installed the three 6,0m/s passenger lifts in 1966 - I certainly climbed it often enough during construction. Without even the input of wind interference, just the linear coefficient of expansion on the concrete walls between sunrise and sunset was approximately 450mm, resulting in us having to line guides between 23:00 and 05:00 to ensure a reasonably neutral position.

Eugene’s article in this issue underlines the urgency for a recognized standard to be adapted by South Africa ASAP, even if this should be the existing standard utilized by Europe and the USA.
Most of us have very recently received phone calls from our banks, insurers, medical aids and even SARS. In each case we on identifying ourselves, were advised that the phone call was being recorded. More and more business enterprises are turning to this newly available technology where they require to record contractual details and even for possible subversive activities such as fraud. This has been especially necessitated by the lethargy in the GPO’s snail-post of the past 18 months, not to mention the cost of overland postage. The recent GPO strike is a case in point, where we have in January received post dispatched back as far as July 2014 … not to mention car license renewals which are now overdue, etc.

For us individually, it is equally as simple to record incoming calls on our latest state-of-the-art cellphones, but it is unlawful! To record another person’s phone calls, you require their prior permission. In terms of Section 2 of the Rica Law, no one may intrude on another’s privacy and communications without their permission. This law states that you may not even read their e-mails or messages. For this reason, many business e-mails has a post-script that the message is for the addressee only, and not for general consumption,

The seriousness of these transgressions only becomes transparent when you view the criminal penalties, for it falls within the criminal ambit - If you are convicted of any of these infringements, you could be jailed for up to 10 years or fined up to mR20.

**NEW LIASA POSTAL CONTACT DETAILS**

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New LIASA membership cards were issued to all present at the September 2014 Conference, who had paid their subs. The balance will be posted as soon as the GPO service resume to normal, inclusive of the relevant CPD advice forms. Remember that proof has to be retained in case you are called on to present them to ECSA. Membership of LIASA ensures an ECSA subscription rebate more than equal to the LIASA subscription, being a motivator to engender or retain LIASA membership.

**EDUCOM COMMUNICATIONS**

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Please forward us your newsworthy articles and photos for dissemination to all our colleagues around the RSA.

Articles contributed to Educom are evaluated by ECSA as CPD, assisting you to achieve your minimum 5 points per year, averaged out over 5-year rolling periods. Remember that …

<< Ignorance of FACT is no excuse for any stated non-compliance >>

<< Liberty means responsibility - That is why most men dread it >>

George Bernard Shaw