The biggest supply contract of road lighting luminaires in South Africa was awarded to BEKA (Pty) Ltd. This award is for the ambitious project of the South African National Roads Agency Ltd (SANRAL), to improve the existing and future highways in Gauteng with new lighting.

Gauteng, the economic heartland of South Africa, generates nearly 38% of the total value of South Africa's economic activities. Development in housing, offices, retail and industrial properties has grown significantly over the past 10 years, resulting in above average traffic growth.

Unfortunately, provision of road infrastructure has not kept up with the increased traffic demand, ensuing in a road and freeway network that is over capacity.

The over-saturated condition on the freeway network is affecting the quality of life, the productivity of the economy, the development potential of the region and the direct cost of travel.

In order to improve the current traffic flow situation and to provide a road network that will stimulate the development potential in the province, the South African National Roads Agency Ltd (SANRAL) is upgrading the existing network, as well as providing additional infrastructure.

During the initial construction period, from July 2008 to May 2010, the existing network will be enhanced by the addition of lanes and improvement of intersections.

For all highways the implementation of an Intelligent Transportation System (ITS) for the effective management of the network is implemented. ITS devices such as CCTV will assist in early detection of incidents/crashes and assistance/clearance thereof. Thereby a safer

Continued on page 4
From the MD’s Desk

We are living in interesting times! No, I do not want to comment on our local political events, but I refer to the many challenges and opportunities which are facing lighting companies, like BEKA. If I would have been asked some 5 years ago, about exciting developments in the Lighting Industry, I would have confessed that nothing really interesting and revolutionary has been happening for some decades.

Now, we are faced with a new lamp technology, the Light Emitting Diode, in short, LED, which will be changing the lighting world we are living in.

The simplicity with which LEDs are dimmed and colours changed is due to the availability of ever increasing electronic control technology, enabling the provision of the right lighting, at the right time and for the right application and mood. Nothing of this sort would have been feasible with conventional technologies.

BEKA has recognised the looming change of technologies well in time in order to align its product range and customer support in such a manner that these technologies, as they become more efficient and cost effective, be offered in technically good performing lighting products. This is what the market expects from BEKA’s products.

This has become evident in the fact that BEKA was chosen to supply the most ambitious LED lighting project of the Southern hemisphere, namely, to light the façade of the Arch spanning over the Moses Mabhida World Cup 2010 Stadium. Refer to page 4 for more details.

BEKA has, with its international partners, the Schréder Group and, on this project, OSRAM, committed itself to provide a turn-key solution for this high-profile project. This project will be the starting point for BEKA’s substantial range of LED luminaires, to be available to its customers nationally and internationally.

BEKA is proud to be recognised as the strongest professional lighting brand in Sub-Saharan Africa. Its level of competence and its comprehensive range of quality luminaires, developed in South Africa, make BEKA the preferred partner for professional customers in this important and growing market.

We have adapted to the new technologies like no other manufacturer on this continent, and we are ready to offer you the most technically advanced solutions.

Johann Schleritzko
LED Arch Lighting for the Moses Mabhida Stadium

BEKA has been awarded the LED lighting for the Arch of the Moses Mabhida Stadium in Durban, South Africa, which is the most prestigious LED contract in the Southern Hemisphere.

This Arch, which has a façade height of 6m, and which will reach a height of 110m above the stadium ground, will be the architectural centrepiece of this stadium and will become a tourist highlight, since it will be made accessible to visitors of the City.

This contract will include:
- The supply of 750m of LED units, comprising a total of 14,832 LEDs, Type OSRAM Golden Dragon.
- These LEDs are to be controlled by 412 DMX channels, generating a dynamic lighting pattern along the arch of the stadium.
- BEKA shall be responsible for the design of the LED channels and bracket supports, as well as the design of the LED control units, comprising power supplies and DMX drivers.
- BEKA will supply and install the supporting DMX Control infrastructure, which ensures the dynamic lighting of the Arch façade.
- The quality assurance will be given the highest priority, due the accessibility of the arch being extremely limited once complete.
- All design solutions will be validated by R-Tech, which is the Research & Development Company of the Schréder Group, as well as OSRAM laboratories.
- BEKA shall also be appointed for the installation and commissioning of this lighting solution.
- The final value for the complete contract is anticipated to be R4,5 million.

BEKA's comprehensive solution was chosen, based upon the offered design, manufacture, installation and commissioning for the LED lighting for one of the world’s most challenging show pieces.

BEKA lights up Gauteng highways - continued from inside front

In order to support the ITS, a quality lighting installation is required which will also improve roadside security at night.

The need for quality lighting has been reflected in the specification which has been commissioned by the NRA (National Road Agency), and which was based on:
- Quality of luminaire hardware
- Minimum capital cost per km
- Minimum energy cost per km
- Minimum maintenance cost per km

BEKA is pleased to report that its luminaire, the ONYX 33 600W, was chosen for this ambitious project, which requires the delivery of 6500 luminaires over a period of 5 years.

This represents an order value of over R25 million, and is the biggest order for streetlight luminaires ever awarded in Southern Africa.

The luminaires will be installed on 20m masts, which are mounted on the F-shape median barriers in the road environment.
Lighting of Johannesburg Soccer City – Precinct

The Precinct of the Johannesburg Soccer City World Cup Stadium consists of all roads and parking areas surrounding the stadium.

For these prestigious areas, the architects were devising a lighting concept which shall be unique and blend into the design concept of this area.

A geometric shape was chosen to contrast with the “earthy” feel of the stadium.

After a thorough evaluation process, which included the quality of the design finishes and efficiencies of the luminaires offered, BEKA has been chosen for this high profile installation.

The luminaires will be equipped with a 150W Metal Halide lamp, G12 lamp holder which operates in the highly efficient Micro reflector used in many other Schréder Urban luminaires.

The light source for the pedestrian luminaires is the 57W CFL lamp, which has been chosen for its instant cold and hot re-strike properties.

Both lamps are required in the Warm White colour, to support the architectural concept.

BEKA luminaires will feature at the Precinct of Soccer City and also in related areas, such as:

- The Rand Show Road and Nasrec Road
- The main concourse lighting in the stadium
- The canopy lighting of the stadium
- The lighting of the adjacent railway station

We are proud that BEKA’s products and expertise are used in almost all Soccer World Cup 2010 installations.

BEKA supplies stadium lighting in Maseru, Lesotho

BEKA supplied the floodlighting at Setsoto Stadium in Maseru, Lesotho, to upgrade the lighting level to FIFA requirements.

In January 2006, Dyelec Consulting Engineers requested BEKA to provide a comprehensive solution to upgrade the existing lighting levels at the stadium. The existing masts were able to carry additional floodlights, but the existing floodlights were obsolete and unserviceable.

BEKA’s Applications Department proposed a few lighting options as well as a cost-effective solution to illuminate the stadium and ensuring compliance with FIFA requirements. The Application Department also made provision for 4 lighting level stages in their designs.

The client approved the BEKA STADIALUX 2kW floodlight, which embodies the sophisticated reflector system in a hail-proof aluminium housing, manufactured from LM6 aluminium alloy.

As a result of a tender process, BEKA was awarded the supply contract for 240 floodlights, four of these with instant re-strike systems.

BEKA has impressed the client by its quality products and the short timeframe in which we were able to manufacture and deliver the floodlights. The contract period was only one month.
The ONYX 33 proves that it is the most efficient luminaire for highway applications, when the energy consumption per kilometre of freeway is to be minimised. This is an important consideration in times of energy restraint in Southern Africa. The luminaire can be supplied in a Power Switch version, which enables the reduction of light output, coupled with reduced energy consumption and extended lamp life.

BEKA is proud to have been able to offer this advanced group product for these prestigious installations in South Africa.

For this purpose, the City requested proposals for the upgrading of East London's beachfront boulevard, the Esplanade. The requirements were as follows:

1. The pole-luminaire combination shall be of extraordinary design, however timeless in its features.

2. The existing mounting positions shall be used, to prevent the re-reticulation of the road.

3. The lighting levels shall be in accordance with the lighting levels, as required for Class A2 Roads, as per SANS Code: SANS 10090: Lighting of Public Thoroughfares.

4. It shall be suitable to attach Christmas Decorations over the festive season. Hence the mechanical design shall be suited for this task.

5. The materials shall be suited for this harsh coastal environment, and all efforts must be made to make these columns and luminaires as maintenance free as possible.

6. The luminaires shall provide white, unobtrusive lighting, which shall prevent light pollution and interference for the residential apartments along the esplanade.

7. The system shall be able to operate as energy efficiently as possible.

Of the various proposals received, the proposal by Designer Lighting, a well established East London electrical contractor, received the highest plaudits and was awarded the contract, using HESTIA luminaires on curved 10 meter mounting height steel poles. The HESTIA, with its advanced IP66 SUPRA reflector system offers supreme resistance to the humid seaside conditions. Its sleek design and high performing 2*150W Metal Halide lamps complete an eye catching combination on curved 10m mounting height steel poles. The street lighting was complemented by single HESTIA-Mini 150W Metal Halide luminaires mounted on the back of the poles over the sea-facing sidewalk.

By replacing the old 2*400W HPS and 1*400W HPS fittings with the new HESTIA, an energy saving of 36.2% has been achieved.

The new look of the East London Esplanade is a dazzling example of how a city's best assets can be showcased using modern, high performing and aesthetically pleasing streetlighting.
In 2007, uMngeni Municipality developed an open piece of ground in Howick between the R103 Main Road and the River View Road into a multifunctional sports facility. The development consisted of a main soccer field, surrounded by an athletics track, with brick grandstand facility, practice soccer field, volleyball courts, tennis courts, car parking, picnic areas, and a large indoor multifunctional sports centre. This development is available to the local community, and controlled from a central electrical room within the grandstand building.

The practice field and volleyball courts each required 6 x 18m masts with 3 x 1kW BEKA PROJECTOLUX Metal Halide floodlights on each mast. The multifunctional indoor centre required 35 x 400W BEKABAY Metal Halide enclosed High Bay light fittings, 19 x BEKA T-BAY 4 x 54W enclosed luminaires with lamps, and 9 x BEKA T-BAY 4 x 54W enclosed luminaires with one lamp on emergency THX self-test battery backup. The lighting stage switching is controlled from a central electrical room within the indoor centre building.

This installation is one of many stadia in Southern Africa using the BEKA STADIALUX 2kW floodlight.
BEKA's new floodlight version, the BEKAMAX-F 600W

BEKA has expanded its popular BEKAMAX floodlight range by adding a 600W HPS version. This lamp is gaining popularity amongst users and lighting engineers, as it offers a high lumen package with good lighting control in efficient reflector systems.

The use of the BEKAMAX floodlight reduces not only light pollution, but also saves energy due to its highly efficient reflector system.

The main characteristic of this floodlight is its vertical beam distribution at 67 degrees, when the luminaire is positioned horizontally. This allows the lighting of large areas, without causing glare to the neighbourhood, something which environmentally-concerned lighting designers are trying to avoid.

Its typical use is in high-mast lighting applications, which would have been traditionally equipped with 6 x 1000W HPS conventional floodlights on 40m high masts.

BEKA recommends a configuration of 9 x BEKAMAX-F 600W floodlights on a 40m mast to achieve optimum spread at minimal glare, thus resulting in a significant energy saving. The total-cut-off angle in this configuration will be at 90 degrees from the downward vertical.

The 600W version, which houses the control gear in a remote stainless steel box, attached to the stirrup, can also be used in various sports lighting applications, such as hockey, tennis, netball, etc.

BEKA VAPOURLINE, an industrial corrosion-resistant fluorescent luminaire

BEKA has added a new industrial corrosion-resistant fluorescent luminaire to its range, the BEKA VAPOURLINE.

It is designed for fluorescent lighting applications in industrial, mining and corrosive environments where high ingress protection is required. The luminaire consists of an injection-moulded, flame-retardant polycarbonate housing and prismatic diffuser. The diffuser is manufactured from the same material as the housing, thus ensuring the flame-retardant integrity of the luminaire.

The diffuser is secured in place through multiple sprung stainless steel clips which ensure the integrity of the IP66 rating.

Two of these clips keep the diffuser attached to the luminaire when hinged open, for ease of lamp replacement.

The BEKA VAPOURLINE is supplied with a complete mounting kit for suspension or surface mounting with glands, providing versatile installation methods.

The BEKA VAPOURLINE can be supplied in various versions from 1 or 2 lamp, 600mm to 1500mm with either T5 or T8 lamps and 110 Volt to 230 Volt electronic control gear.

This luminaire's robust corrosion-resistant housing and diffuser make it an ideal application in industrial environments, as well as in mining, public buildings, and in any other damp and corrosive environments.
BEKA T-BAY, a quality fluorescent highbay

BEKA has created a new quality fluorescent highbay, the BEKA T-BAY. It is specifically designed for surface-mounted applications in industrial or commercial areas and is available in a four lamp version operating 54W and 80W T5 lamps in a narrow and medium beam distribution.

This ensures flicker-free lighting and provides instant cold and hot starting, which makes them ideal to be operated on stand-by generator or UPS circuits. The luminaire has a most efficient reflector system of over 90% efficiency. It is also available with a clear acrylic lens.

BEKA T-BAY, a quality fluorescent highbay

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Expanded range of BEKA products for high powered 85W and 120W CFL lamps

The quality, quantity and reliability of emergency lighting have become a concern and focus for electrical engineers and lighting planners over the past months. In public spaces, indoors or outdoors, where at times hundreds or even thousands of persons could congregate, a reliable light source, operated in a reliable luminaire, becomes a necessity.

BEKA has, for this purpose, expanded its range of luminaires with a most contemporary light source, namely the 85W and 120W Compact Fluorescent lamp (CFL).

The advantages of this light source are compelling:

They offer instant cold and hot re-strike. This makes this version perfectly suitable to be connected to UPS circuits. No inrush currents have to be considered neither at cold nor hot re-strike conditions.

They are operated by electronic control gear, which ensures flicker-free, constant lamp output at varying voltages as well as temperatures. These lamps are now available in BEKA's products, such as the BEKAMAX 120W CFL, which is a model range incorporating area, floodlight or wall-mounted up- and downlights.

BEKAMAX 120W CFL

These CFL lamps are available in different colour temperatures, of 3000 and 40000K. This makes it most suited to become a complementing light source in an installation, which has to blend with a Metal Halide installation.

These lamps have a powerful lumen package of 9000 lumen (120W CFL) and 6000 lumen (85W CFL), resulting in a luminous efficacy of 70 to 75 lm/W. It provides an average life of 20,000 hours, as per the lamp manufacturer's documentation. The lumen output range is available over a wide temperature range of between +50°C and +70°C. This makes it perfectly suitable for interior and exterior applications.

The BEKABAY 120W CFL is most appropriate in industrial applications where reliable instant striking and flicker free light sources are required.

BEKABAY 120W CFL

BEKADAZZLE 120W CFL with open 465 Reflexor

The BEKADAZZLE 120W CFL is most appropriate in large commercial installations operated on standby generator circuits, to ensure the safety of their clients. These luminaire versions are available immediately from BEKA.
Public Lighting Networks - how to reduce energy consumption!

In view of the energy crisis with which South Africa is currently faced, BEKA (Pty) Ltd organised a one-day seminar titled: “PUBLIC LIGHTING NETWORKS - HOW TO REDUCE ENERGY CONSUMPTION!” which was held on the 3rd of March 2008 in Midrand, Gauteng, South Africa and subsequently Gaborone, Botswana, and Mbabane, Swaziland.

The conference in Midrand was attended by 160 persons from all over the country, with representatives from all major Councils and Electrical Consulting Engineering offices.

The proceedings were opened by the Manager of the National Energy Efficiency Agency, Barry Bredenkamp, who presented an overview of current government programmes to fast-track the implementation of energy efficient streetlight luminaires.

BEKA's presentations covered all relevant technologies, which assist the country to find a sustainable and economical solution in reducing energy consumption of streetlights. They also covered technology aspects such as solar-powered luminaires, Voltage Reduction devices, Telemanagement and the problems related to HID light sources on generator-powered circuits.

Luminaire technologies were discussed, such as conventional ballasts versus electronic ballasts, Power Switch and Timed Power Switch, as well as Reflector technologies, which were supported by case studies.

New System to be introduced for Luminaire Efficiency

By Murray Cronjé - Applications Manager - BEKA

INTRODUCTION

With Eskom's generation capacity in short supply and with electricity tariffs likely to increase even more, it is imperative that new building projects must squeeze all the lighting energy out of every kilowatt consumed. Today's lamp and ballast innovations help to achieve this, but lighting specifications should ensure that the luminaires which use these lamps and ballasts also maximize the buildings energy investment in the long run.

Thus, the SABS's lighting sub-committee S64C have decided to initiate a proposal to amend SANS 475 to include the measurement and calculation of the luminaire efficacy rating (LER) and to create a working group (WG) who will come forward on how to implement LER values and what the minimum LER values should be for different types of luminaires.

By adding LER to their specifications, lighting professionals can ensure energy efficiency in their designs and educate their clients about lighting project energy consumption.

THE PURPOSE OF LER

To establish a luminaire efficacy rating (LER) based on rated Lumens per Watt, in place of an efficiency rating based solely on either coefficients of utilization or luminaire efficiency, or total light output ratio (TLOR). The word “rated” is used so as not to require the use of absolute photometry and to be able to use published rated lumen values. LER is calculated using both ballast factor, when applicable, and total input Watts to establish the rated efficacy of the luminaire. (LER is given in rated Lumens per Watt.)

THE FORMULA FOR DETERMINING LER

Luminaire efficacy rating (LER) shall be calculated for a given luminaire by the following formula:

\[
LER = \frac{\text{TLOR} \times \text{LO}}{\text{WATTS INPUT}}, \text{ for Incandescent Luminaires}
\]

\[
LER = \frac{\text{TLOR} \times \text{LO} \times \text{BF}}{\text{WATTS INPUT}}, \text{ for Discharge Luminaires}
\]

Where:

LER = Luminaire efficacy rating, expressed in rated Lumens per Watt.

This value shall be expressed as a whole number, rounding up (> 0.5) or down (< 0.5) as required.

TLOR = Luminaire's total efficiency, expressed as a two-place decimal, rounding up (≥ 0.005) or down (< 0.005) as required.

LO = Total initial lamp lumens which is the total number of lamps in the test luminaire multiplied by the published rated initial lamp lumens.

BF = Ballast factor of test ballast or the average ballast factor of test ballasts used in the photometric test.

WATTS INPUT = Total Wattage of the luminaire as measured during the photometric test.

A LUMINAIRE’S “MPG”

LER is similar to the kilometers per liter rating for motorcars and includes all components of the luminaire system.
It is a single figure that expresses luminaire efficacy, the luminaires light output divided by the input power.

Actually, comparing the LER of two luminaires is not as simple as comparing the fuel consumption on motor cars, because fluorescent luminaires for example, come in several major categories. Thus, when the WG make their proposal for minimum LER values, these should distinguish between the chief categories of luminaires: fluorescent, commercial downlights and HID industrial luminaires, and the major categories within each.

For example, in the USA they use the following categories:

**Fluorescents:**
- 600x1200mm lensed recessed, 2-4 lamps, S/Hm > 1.1, and a specific UGR
- 600x600mm lensed recessed, 2-3 CFL lamps, S/Hm > 1.1, and a specific UGR
- 600x1200mm louvered recessed, 2-4 lamps, S/Hm > 1.1, specific UGR, shielding angles <22, 22-29, 29-30
- 600x600mm louvered recessed, 2-4 CFL lamps, S/Hm > 1.1, specific UGR, shielding angles <22, 22-29, 29-30
- Surface mounted plastic wraparound, 2-4 lamp, width <230mm, 230-305mm, >305mm
- Commercial open fluorescents, 1-2 lamp 1200mm, 1-2 lamp 1500mm
- Industrial fluorescents, 2 lamp 1200mm, 2 lamp 1500mm

**Downlight luminaires:**
- Open reflector systems, all lamps, shielding angle <40, >40
- Baffled optical systems which are at least 75% light absorbing, all lamps, shielding angle <40, >40
- Lensed optical systems, all lamps, shielding angle <40, >40
- Louvered optical systems, all lamps, shielding angle <40, >40

**HID industrial luminaires:**
- Open luminaires, ULOR 0%, <10%, <20%, >20%, 150-400W, 400-1000W, >1000W
- Enclosed luminaires, ULOR 0%, <10%, <20%, >20%, 150-400W, 400-1000W, >1000W

Minimum LER values are then published for all these different categories, for example, an open 400W high bay luminaire with 0% upward light will have a minimum LER of 50, whereas the equivalent closed one will have a minimum LER of 45. As the upward light efficiencies increase, so the minimum LER values also increase.

**CONCLUSION**

Luminaire Efficacy Rating (LER) shall be specified as a minimum value, a value which cannot be lowered by changing the type of applicable lamp after original installation. The input Wattage used in the LER calculation should be the rated input Wattage for the ballast that is used in the manufacturers’ standard product offering. Obviously, the concept of LER can be misused because a bare lamp will produce the highest LER value. Thus, the WG who have been appointed to investigate the implementation of LER and minimum values will have to ensure that their proposals make provision for mechanisms which will prevent the misuse of LER values.

Although the proposal, which is currently being circulated, to amend SANS 475 is to measure and calculate the LER values for all luminaires, it is foreseen that in the short term the use of LER values for street lighting and floodlighting luminaires will not be implemented.

With this powerful software tool, which was demonstrated by BEKA’s Applications Manager, the most efficient luminaire and pole configuration can be calculated. The presentations can be downloaded at http://www.beka.co.za/node/297

**WHAT IS DALI?**

- **quick facts**

DALI is not a product, nor manufacturer specific technology. DALI (Digital Addressable Lighting Interface) is a protocol, or language, as set out in the technical standard IEC 62386.

DALI is a dedicated protocol used purely for lighting control, and therefore is not designed to control other systems, nor replace a building management system (BMS).

DALI is effective for scene and group-based lighting control as well as incorporating two-way communication for feedback regarding faulty lamps and control gear. This is useful where remote supervising, service and energy reports are required.

**DALI Basics**
- Simple two-low voltage control cable (control signal voltage is between 2.4 and 9.5 Volts)
- Each DALI dimmable Electronic Control Gear is assigned a unique address
- Maximum of 64 addresses per control circuit
- Individual or group control through addressing or broadcast messaging (e.g. ALL OFF)

Available programmable parameters also include setting the Maximum Level, Minimum Level, Dimming Fade Time and Dimming Fade Rate. This allows the ability to customise each component of an installation, or the entire installation, to create the required mood or effect required.

DALI is ideal for boardrooms and functional areas where scene selection and group-based dimming are required. Function rooms with variable layout configurations also benefit from the addressing ability of DALI, which negates the need to rewire luminaires with each change of lighting requirement.
Innovative, creative, efficient lighting solutions

Our products are not only designed for the environmental conditions of the continent but are manufactured to the highest international quality criteria.