



KwaZulu-Natal



Our story, our journey...
1923 to 2012

Produced by: KZN Corporate Affairs Department

for

All KZN Guardians, past and present, whose dedication and passion has seen Eskom KZN grow from strength to strength. With Eskom's growth, the province's economic growth was inevitable. May your legacy keep 'em'powering the province.

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Foreword



Sifiso Pat Mazibuko

It gives me great pleasure to give some introductory thoughts to this book, which seeks to take us through the path we have travelled as Eskom KZN, from Eskom's inception in 1923 to date. It wouldn't have come at a more apt time than this, when we prepare for the organisation's 90th birthday celebrations in eight months' time. Indeed an important occasion in the history of the organisation.

Our province has been led by business stalwarts, who, together with the heroes and heroines who have worked here, have left us a legacy that we are proud of. It is a legacy we wish to build on and pass on to future generations. We salute those heroes and heroines who helped shape Eskom to be what it is today. We also commit to take Eskom to the next level.

Our path has been guided by the national context within which we operate, which explains the structural changes that have taken place over the years. Such context has also created the parameters within which the provincial strategies have been framed.

Our contribution to the province's economy has been remarkable, whether as a direct or indirect supplier. The province's vibrant and growing economy has kept us on our toes as we strived to ensure we deliver adequate electricity supply. With a number of massive projects in the pipeline e.g. the R10bn Durban port expansion, it's critical that we rise to the occasion and enable this. As such the global recession has somewhat assisted by curbing the growth rate, giving us some breathing space and an opportunity to maintain and expand our networks and substations in preparation for future peaks.

Electricity is the lifeblood of the economy. In our province alone, it has changed the lives of thousands and thousands for the better. Our competitiveness has given rise to foreign direct investments (FDI) e.g. through companies like Richards Bay Minerals, Hillside and Bayside Aluminium, Foskor, etc. This, among other things has improved employment opportunities, increased bursaries offered as well as stimulated corporate social investment projects.

An emphasis has been placed on the socioeconomic development of disadvantaged communities. To this end, we have actively partnered with our stakeholders to help improve the living standards of our rural communities. Our electrification programmes have changed the lives of 600 000 households. We are committed to serving our communities and will involve ourselves wherever we add, as well as derive value.

As the national agenda evolves, so will our strategies. We are poised to 'power' the KZN economy.

Sifiso Pat Mazibuko
General Manager: KZN OU



KwaZulu-Natal

1. Introduction

KwaZulu-Natal in perspective...

KwaZulu-Natal (KZN), one of the nine provinces, has historically been a key component of the South African economy. Vasco da Gama sighted the Durban bay on Christmas Day in 1497. In Portuguese, Christmas is called Natal, which resulted in the original name of the region. KwaZulu, which means the Kingdom of the Zulu, was added not too long ago, resulting in the name of the province being KwaZulu-Natal.

The province has grown into a radiant region, occupied by diverse ethnic groups. The province's well being is attributable to a number of factors, including inter alia, an opportune location, vast resources, good infrastructure, sound logistics and a growing economy.

The province has a good supply of natural, mineral and metal resources. KZN has an abundant of industries utilising such resources. These are the aluminium, automotive, transport, warehousing, finance, real estate, clothing and textiles as well as petro-chemicals industries. This has aided the province's economic growth. According to 2010 figures, KZN is the second highest contributor (of the nine provinces) to the Gross Domestic Product (GDP). The contribution to the country's GDP averaged 16.4 percent between 1995 and 2009.

KZN's diversified manufacturing sector is also the second largest in the country second to the Gauteng Province. The manufacturing sector contributes close to 20% of GDP. Nearly a third of South Africa's manufactured exports are produced in KZN. According to the provincial government, manufacturing is the biggest contributor to the province's gross geographic product (GGP). (www.kznonline.gov.za).



A view of Durban harbour



Moses Mabhida Stadium

KwaZulu-Natal is the market leader for domestic tourism in South Africa, and second in terms of international tourism. A current provincial strategy focuses on ensuring that world class events are attracted to KwaZulu-Natal, this reinforces the province's passion for sport, art and culture. The Moses Mabhida Stadium is a defining landmark of Durban's skyline. The stadium is not only a tourist attraction in its own right, but also the centrepiece of the King's Park Sporting Precinct. (www.kznonline.gov.za).

However, in order to have sustainable economic growth, there is need for commitment from all role players by aligning this towards the province's vision for such growth. Eskom has a pivotal role, of supplying electricity to the different sectors, cannot be over emphasised. Electricity is an enabler to the economic growth and social upliftment of the province. In his 2011 State of the Province speech, the KZN Premier, Dr Zweli Mkhize, pleaded with business players and communities to unite and hold hands in partnership and work together to build KwaZulu-Natal and take South Africa forward. Eskom committed to play its part in fulfilling this vision.

2. The Eskom KQV story

The journey begins...

The Government Gazette of 6 March 1923 announced the establishment of The Electricity Supply Commission (Escom), effective from 1 March 1923. It was also known by its Afrikaans name Elektrisiteitsvoorsieningskommissie (EVKOM). The two acronyms were combined in 1986 and name Escom was changed to Eskom in 1987.

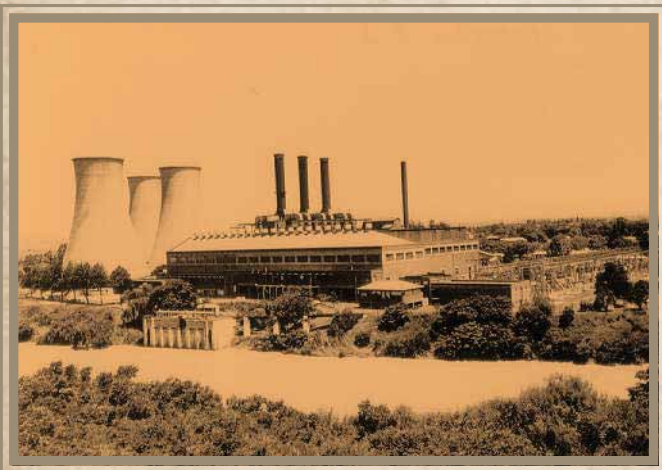
Dr Hendrik Johannes van der Bijl, a leading research scientist appointed by the Smuts government as a “Technical Advisor on Industrial Development to the Department of Mines and Industries”, was appointed first Chairman of Escom. The Commission was made responsible for establishing and maintaining electricity supply undertakings on a regional basis. Electricity was to be supplied efficiently, cheaply and abundantly to government departments, railways and harbours, local authorities and industry. The Commission met for the first time on 20 March 1923 in Cape Town. The Commission’s headquarters opened in Johannesburg on 1 May 1923 on the first storey of Hofman’s Buildings. The headquarters moved to Electricity House in 1924.

It was only in 1925, that the Natal Central Undertaking was established when Escom obtained four power supply licences, which included the Natal Undertaking licence.

Natal Undertaking was responsible for the whole value chain, generation and distribution (distribution incorporated transmission). Four power stations were built over the years and later the Drakensberg Pumped Storage Scheme was added to the mix. Currently, the Ingula Pumped Storage Scheme is under construction.

a) Colenso Power Station

Colenso Power Station was the first thermal power station to be operated by the Electricity Supply Commission (Escom) although it was not originally an Escom undertaking. The power station, substations and transmission system which constituted the Colenso Undertaking, were constructed by the Railway Administration. The station was to supply power for the electrification of the Natal main line between Glencoe Junction and Pietermaritzburg, a route length of 274 km. Electrification of the line had been authorised by Parliament in 1922 and the official opening of the line took place in June 1926. It was the second biggest railway electrification scheme in the world, second only to the Chicago line. (South African Railways and Harbours Magazine, July 1926:972)



Colenso Power Station

On 24 December 1926 an agreement was reached between the Minister of Railways and Harbours and Escom for the takeover of the Colenso Undertaking. The date of the takeover was subsequently fixed for midnight on 15/16 January 1927 and the undertaking became known as the Natal

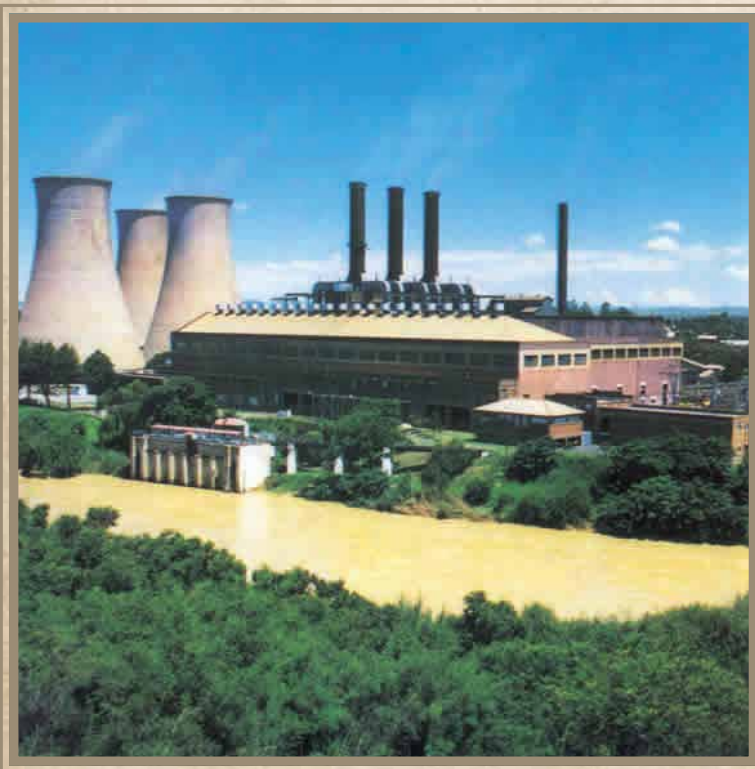
Central Undertaking. The power station staff was taken over by Escom with the Undertaking. When Colenso Power Station was taken over by Escom, the principal equipment installed consisted of five generators and eight chain grate boilers with a total capacity of 60 MW. In 1959 there were nine generators, nineteen boilers and three cooling towers, the total installed capacity was 165 MW. The first six generators and their associated boiler house constituted what became known as Colenso No. 1. The last three generators and the second boiler house were known as Colenso No. 2.



View showing the original cooling water intake works set back from the river bank. This silted up while the station was still being commissioned and a new intake was constructed.

The original five generators were decommissioned in 1973 and the sixth in 1980, leaving only Colenso 2 in service with a station installed capacity of 80 MW. Colenso, the longest serving station at that time was finally taken out of service and decommissioned in September 1985. The total net electrical energy sent out by Colenso from takeover by Escom at the beginning of 1927 until closure in 1985 was 21 043 GWh. The total quantity of coal burnt was 15,4 million metric tons. (Escom Annual Reports 1973:67, 1980:49; Escom Statistical Yearbook 1985:12&13; Escom Statistical Yearbook 1995:15)

When the power station was finally closed down, most employees were offered jobs elsewhere in Escom. According to Mrs Alexander, many employees chose to retire rather than face moving to a larger city or town, after living most of their lives in Colenso. The existence of the power station at Colenso had an enormous effect on the town. Its construction transformed the village, whose greatest prior technological achievement had been the arrival of the railways in 1886. Colenso has never been the same since the closure of the power station after which economic activity declined tremendously.



View after decommissioning of Colenso 1 boiler house and removal of the chimneys

Since housing was not available in the township of Colenso, the Railway Administration had to construct quarters for their staff. In 1926 there were 36 brick residences, however, this was insufficient. Ten wood and iron houses and two blocks of single quarters, used during the construction period had to be retained for the accommodation of the permanent staff. When the power station was taken over by Escom in 1927, “the single quarters and some of the wood and iron houses were not in a fit condition to be occupied” and proper mess facilities were non-existent. It was decided that additional brick houses for married men and 28-roomed single quarters for the single men, should be constructed as soon as possible. A recreation hall was also urgently needed as staff was still using an old wood and iron building that had been used as a Railway Institute for the construction staff. As the Colenso Township had no water supply scheme, water for domestic and other purposes had to be carted from the Tugela River. An agreement was reached between Escom

and the Local Board in 1927 for water to be supplied in bulk to the Board from Escom’s domestic water scheme. The Board undertook the reticulation of water services in the Township other than only to the Escom houses and quarters. (Escom Annual Reports 1926:7, 1927:10,11).

By 1928 the first phase of houses for married men and single quarters had been completed and occupied. A new recreation hall was built which besides providing boarding facilities for the single men, was designed to provide amenities for the employees and their families as well. This was required as it was not otherwise available in a small town like Colenso. The official opening of the club-house was performed by one of the Escom Commissioners, Mr Karl Gundelfinger, and the old wood and iron buildings provided as a Railway Institute for the construction staff were taken down by the Railway Administration. A golf course and tennis courts could be used by staff and a bowling green was laid and officially opened by Dr HJ van der Bijl.



Escom Club House which incorporated a mess for the single quarters. In 2003, the club still had an active membership.



Tennis courts behind the Club House

(Escom Annual Report 1928:16; Escom Megawatt No.25/1972:19-20, No.32/1974:35)

Colenso Milestones

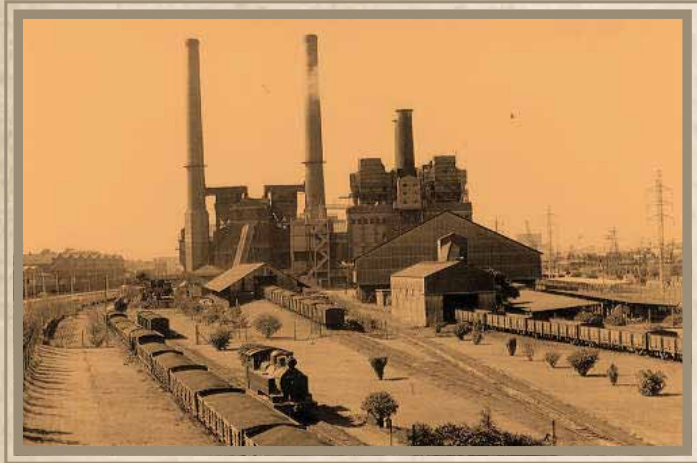
- 1928 The first full year after take over by Escom
- 1945 The year that generator 6 was commissioned
- 1950 The year after generator 7 was commissioned and also the year of highest thermal efficiency
- 1953 The year that generator 8 was commissioned
- 1960 The year after generator 9 was commissioned and also the year of highest generation
- 1971 The year of highest net maximum power (maximum demand)
- 1971 The year of the link-up with the 400 kV transmission network
- 1984 The last full year in service



b) Congella Power Station

Congella Power Station, in Durban, was one of the first power stations to be both built and operated by Escom. On 21 April 1925, Escom and the Durban Municipality agreed that Escom would erect a new station at Congella, approximately 5 km from the city centre. The primary objective in building Congella was to supply the growing needs of the Durban Corporation, and the station was to be extended once the Railway Administration decided to electrify the Durban to Pietermaritzburg line. Congella was commissioned in July 1928. Electrification of the Durban to Pietermaritzburg line was completed eight years after Congella was commissioned, but power was supplied from Colenso. Although the first sets were designed to carry traction loads, traction load was not supplied from Congella until 1948, 20 years after the station had been commissioned. (Escom Annual Reports 1923:10&11, 1948:12; van der Bijl & Damant 1933:62; South African Railways and Harbours Magazine January 1937:9).

Congella had an initial installed capacity of 24 MW in 1928, which, by 1938, had been extended to 98 MW. Shortly before the outbreak of World War II (1939-1945) it was decided to build Congella 2 station on the same site and the first station became known as Congella I. A 40 MW set was ordered, the largest then in Escom. (The Cape Town City Council commissioned the first 40 MW set in South Africa at their Table Bay Power Station in February 1939, and had three 40 MW sets in full commercial operation by November 1939. Table Bay Power Station used the highest steam pressure and temperature of any power station in South Africa at that time. The set ordered for Congella was a similar set and from the same manufacturer, Parsons & Co). The first set and three boilers manufactured for Congella 2 were commandeered by the British Government and installed at Earley Power Station in Great Britain to provide power for war industries. The replacement set was lost at sea in 1943 when the ship delivering it was sunk by enemy action. The first set was eventually commissioned after the war in 1946. A second 40 MW set was commissioned in 1948 and a third in 1951, however the boiler plant ordered with this last set



Congella Power Station

was not completed until 1954. The installed plant capacity at Congella 2 was then 120 MW and at Congella 1 was 86 MW, as two 6 MW sets had been transferred to Kimberley. The total final installed capacity was thus 206 MW. (Escom Annual Reports 1940:18, 1943:10&17, 1944:35, 1946:37, 1949:31, 1951:34, 1954:37; Escom Golden Jubilee 1923-1973:19; Palser 1895-1995:38, 173).

Congella I was one of the world's most advanced power stations in its day. It was the first station in South Africa to burn pulverised coal and the first to be equipped with electrostatic precipitators, yet its nickname, Old Smokey, persisted. Congella had been in service for more than 50 years when it was finally decommissioned at the end of 1978. The total electrical energy sent out from Congella 1 and 2 was 22 154 GWh and the total quantity of coal burnt 15,089 million metric tons. (Escom Annual Report 1984:9 and Tables of Power Station Operating Statistics)

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Congella I Turbine House before 1939

Congella Milestones

- 1929 The first full year of production.
- 1932 The year installed capacity was increased to 48 MW.
- 1939 The first full year with Congella I at its final installed capacity of 98 MW.
- 1946 The first 40 MW set commissioned, and this was the largest set in Escom at that time
- 1949 The first full year, after the second set at Congella 2 had been commissioned.
- 1951 The year in which the final set was commissioned, and also the year of highest thermal efficiency.
- 1954 The year of maximum net production (GWh) and when Umgeni Power Station was started up.
- 1960 The year of maximum net power (MW).
- 1978 The final year of operation.



Congella I Power Station before World War 2

c) Umgeni Power Station

Soaring demand for power, due to industrial growth, challenged Escom in the post-war period. Escom had to restrict electricity consumption to avoid injury to the national economy. In Durban, power was required for the electrification of the rail system and to meet the demand from the municipality, local industry and other consumers. Natal's two power stations Congella and Colenso had been built in the 1920s and were no longer able to cope with the increasing demand in spite of post-war extensions. Every effort was being made to obtain additional generation and transmission equipment, and plans were made to erect extra power stations, including the Umgeni power station.



Umgeni Power Station

The Umgeni power station was located at the current New Germany Office site. Today as one drives through the area, there is no indication that such a structure existed except for Escom Road west of the site and the Umgeni substation. Gone are the cooling towers, the chimneys, the turbines and boilers that provided the power for KwaZulu-Natal's industry and homes. The decision to build the new power station in New Germany was of great significance to the community. Up to 1948 the area had essentially been a farming community, and it did not have its own supply of electricity until that year. The establishment of the power station initiated a period of industrial growth that developed New Germany into what it is today.

The first generator and two boilers were ready for running tests in April 1954. Generation was commenced at Umgeni on 2 April 1954. By May, it was supplying the Durban Corporation with 33 kV, by August, a third boiler had been added. The change rooms, mess, recreation rooms and stores were still being constructed.

In 1955, number 4 boiler and a second 30 MW turbo-generator were commissioned. Output increased to 228 million units and in order to facilitate interconnection between Umgeni and Congella, a substation was being built at Coedmore, south-east of Umgeni. A second cooling tower was completed in 1957. Generator 3 and boilers 5 and 6 were commissioned in 1957. Generator 4 and boilers 7 and 8 were commissioned in 1958.

By 1961, output from Umgeni continued to increase. Boilers numbers 9 to 13 had been put into operation. The first of two 60 MW turbo-generators was placed on load at end of February 1961, and the second in November 1961. Extension 'B' to Umgeni (the two 60 MW sets and five boilers) increased the station output to over 1 billion units in 1962. As a result of the Coedmore substation, pooling of Congella, Umgeni and Colenso was much improved.

The remainder of the 1960s saw Umgeni adding several 132 kV feeders for the Durban Corporation, as well as other customers. During this period, the power station might well have ended up being called the Phillip Frame Park Power Station. In 1963, the New Germany Town Council wanted to change the area's name to honour a prominent local businessman. Controversy raged until the Town Council backed down and called the industrial area, east of the power station, Phillip Frame Park.

The 1970s saw Escom's entire Southern Natal Headquarters moving to a new building, adjacent to the power station, which at that time was also being used for pollution control tests.

In 1985, the decision was taken to decommission Umgeni Power Station. For three years, the staff experimented with methods of mothballing the boilers. Eventually, in 1988 the decision was taken not to retain the station. Its machinery was to be either exported or sold as scrap in South Africa. For a time, Durban Corporation considered taking over the station for use during peak periods. However, this option was not pursued.

December 1985 to June 1988 saw the power station scarcely used. During this period, the staff complement of 500 was reduced to a skeleton staff of about 100 who oversaw the decommissioning and dismantling. Those who left Umgeni, were redeployed within Eskom, while others took early retirement. The official closing down ceremony took place on 9 February 1989. At an event attended by dignitaries from Eskom, New Germany and Pinetown, Eskom's General Manager Generation, Mr. Paul Semark, shut off the steam supply, thus ending 35 years of operation. Evidence of Umgeni's presence and purpose would remain for another five years. At the end of 1992, the cooling towers, a symbol of industrial expansion and economic well-being to many, and an eyesore to some, were imploded to make way for an industrial township. On 12 June 1994, the three 108m smokestacks were also demolished.



d) Ingagane Power Station

Ingagane, Eskom's fourth power station in Natal, was the largest and most economical in the province, at that time. Colenso and Congella were already thirty years old and had become less cost-effective, while Umgeni had been providing power since 1954. Eskom expected demand to exceed output by 1965.



Ingagane Power Station

Prerequisites for such a power station which was to have double the output of Umgeni, were abundant cheap coal and water close at hand. Accordingly, the new power station would have to be located in coal-rich northern Natal. The Dundee, Newcastle or Ballangeich areas were all viewed as possible sites.

Negotiations with the Department of Water Affairs led to the proposal that a dam be built on the Ingagane River, and the power station be located near the river, south of Newcastle in Northern Natal. This decision also ensured a supply of coal since Newcastle lies at the northern extremity of the Klip River coalfield.

Construction of Ingagane began in 1959. The next four years saw steady progress being maintained in developing the site. Eskom also built a village (next to the power station) with 320 houses for Ingagane's employees. By 1963, Ingagane power station was ready for commissioning, on schedule.

The first machine and boiler started work on 29 April 1963 under the direction of Ingagane power station's first Superintendent, Mr. H.K. (Koop) Groenink. At first, the operation of Ingagane had to be restricted to within the safety limits of its existing transmission equipment. This was due to the fact that the transmission line between Ingagane and the switching and transforming sub-station at Georgedale, which controlled the incoming 275 kV circuits from the power station was not yet ready. The power station was designed to operate either as a base load station or a peak load station, with a projected installed capacity of 500 MW. This was much larger than the other three power stations in Natal. Colenso's was 165 MW, Congella's 206 MW and Umgeni power station's 340 MW.

Output from Natal's power stations combined, expanded to 3012 million units, an increase of 14,6% over the 1963 figure and maximum demand rose from 465 660 kW to 515 600 kW. Sales grew to 2,922 million units, an increase of 14.9%. The main increases came about due to a greater demand from the Durban Corporation, the Pietermaritzburg Corporation, South African Railways and Feralloys Ltd Works at Cato Ridge.

During the winter of 1971, all of Natal's power stations operated at maximum capacity to meet the load without major assistance from the Transvaal power stations. The year did however begin with a major power failure in Natal. A fault near the Georgedale station caused both transmission lines from Ingagane to trip. The power station had to be isolated from the system and the load switched to Congella, Umgeni and Colenso. A concern at Ingagane was how the power station would restart itself if there was a total blackout and it was completely 'islanded'. There was no generator big enough to



Ingagane Power Station

do this at Ingagane. A successful experiment conducted in the 1980s, involved the newly built Drakensberg Pumped Storage Station restarting Ingagane. In 1972, the interconnection of Natal's four power stations with the large pithead power stations in the Transvaal was enhanced with the completion of the second 400 kV line from Camden and Chivelston. This allowed the older and less efficient Congella and Colenso to reduce output. Accordingly Ingagane became more important for the Natal Undertaking. During this decade, the generation of electricity in South Africa increased by about 8% a year and by 1981 the country was using about 100 000 GWh a year, compared to approximately 22 500 GWh twenty years before. During the same period, per capita consumption of electricity trebled, from 1 125 kWh to 3500 kWh.

A decrease in the demand for electricity during the 1980s and early 1990s and the commissioning of new larger power stations resulted in excess generating capacity. Consequently, the older power stations were no longer required and Eskom decided to store certain of them. Eleven stations altogether were going to be put into storage or mothballed. Eskom decided that Ingagane power station would be mothballed in 1990 and brought back into service in 1996, when it was anticipated that it would be economically viable to do so. The power station was estimated to have a service life of a further 20 years with proper maintenance. The mothballing process began that year. At 5:00am, on 8 January, the first unit was shut down. The remaining units followed between September 1988 and November 1990. On 5 November 1990, at a small ceremony, Mr. Chris Steyn shut unit number 5 down. Ingagane's boilers had steamed more than 760 000 hours by November 1990 and sent out on average 1 314 957 GWh per annum. By this stage most of the approximately 680 staff had left, some, having been redeployed to other power stations, others having taken early retirement.

In 1994, it was no longer deemed necessary or viable to recommission Ingagane. Recommissioning would have been too costly and the decision was taken to dispose of it, but it remained unsold.

Power Stations Social Life

The location of Colenso and Ingagane power stations required that they were essentially self-contained communities. They had in-house recreational facilities and were closely knit communities.

Since Umgeni and Congella were situated in urban settings, their employees were spread out and tended to be involved in sporting and recreational activities in their respective residential areas. Umgeni and Congella employees did at times collaborate on recreational events such as an annual Christmas Tree and a range of sporting activities including soccer, badminton, basketball, cricket and darts.



e) Drakensberg Pump Station

The erection of the Drakensberg Pumped Storage Scheme challenged Eskom in the 1970s. Not only was this hydro-station designed to supply 1 000 MW of electricity during peak periods, but it was to assist in supplementing the contents of the Vaal Dam (south of Johannesburg) with water transferred from the Tugela River in Natal.



Drakensberg Pump Station



Drakensberg Pump Station

During the off-peak periods, Drakensberg was to use its reversible turbines to pump the water back to the upper reservoir, readying the system for peak periods. A special feature of the station is that it is constructed entirely underground, with only a dam wall, lift shaft buildings and transmission lines visible at the surface.

The four reversible pump turbines are situated 52 storeys below ground level. The scheme was commissioned in 1982.



f) Ingula Pumped Storage Scheme

The name change from Braamhoek to Ingula was officially announced in March 2007. Ingula alludes to the creamy contents at the top of a milk calabash. The quest to find an appropriate name for Ingula Power Station was inspired by the mountains and the river waters, which represent the rich cultural symbols and traditions of the indigenous people on both sides of the border.

The pumped storage scheme consists of an upper and a lower dam, each capable of holding approximately 22 million cubic metres of water. The dams 4.6km apart, will be connected by underground waterways passing through an underground powerhouse with four 333 MW generators.



Braamhoek Dam - Ingula Pump Station

To generate electricity during times of peak demand, water will be released from the upper dam and pass through the pump/turbines into the lower dam. During times of low energy demand the pump/turbines will be used to pump the water from the lower dam back to the upper dam.

Construction is underway and the project is estimated to cost about R22 bn. More than 3000 people are working on the site, with most of the general labour force coming from the Ladysmith area. It is expected to come on line in 2014.



Outlet structure

The Distribution Steps

The Natal Central Undertaking, was responsible for the generation, transmission and distribution of electricity in the region, with no distinction between Distribution and Transmission businesses. Lines pulling power from the Power Stations to end users were all under Distribution. As most of the Power Stations were built for railway traction, supply was to these lines as well as towns along the railway lines.



In 1986, the Region was split into Eastern and Western Natal regions and the generation element was hived off to the Generation Group. The Region was therefore left responsible for only the transmission and distribution of electricity. In 1992 the transmission element was moved from the Regions into the newly created Transmission Division and Eastern Region was formed, under the Distribution Division.



Eastern Region was responsible for both the Wires or Engineering and Retail or Customer Services businesses, each headed by a Regional Manager. The Region was divided into four Customer Service Areas (CSA) and Field Service Centres (FSC).

With the start of electrification in the late 1980s, a huge expansion programme was necessary to strengthen the networks as well as increase the number of substations. The customer base increased significantly, in turn, as electrification progressed. To date there are 47 979 km of MV Network, 7 167 km of HV Network, and 413 substations, serving over 700 000 customers.

In order to serve customers faster, the CSAs and FSCs were divided into Customer Service Centres and/or Walk-in Centres (WICs) and Technical Service Centres (TSCs) respectively. TSCs were later changed to Customer Network Centres (CNCs). WICs and CNCs were responsible for their customers' customer service and technical needs. To date there are 17 WICs and 42 CNCs. The more the CNCs, the quicker it is to respond to customer faults, so hence plans to increase the CNCs by a further five are in place.



The increase in customer numbers resulted in an increase in customer queries. This necessitated the formation of Contact Centres that were responsible for the taking and logging of all customer queries. The Westville Contact Centre was established in 1997, with its offices initially at New Germany Office site and later at Westville Office site. On average, the Contact Centre handles 1005555 calls per year, with most of these coming in summer month's when experiences major storms, resulting in power outages. In order to handle the scheduling of faults and despatching of field staff to attend to such faults, the Works Management Centre was established in 1997. Technology has assisted greatly in ensuring a seamless process from fault taking, to scheduling, despatching and close-off of faults.

The Control Centre serves as the nerve centre for the Region. Unlike early days when networks were drawn on a board and horse patrols were the means of detecting faulty lines, today high mast satellites feed the control room with all the information they need, making fault detection easier and faster.

Until the current Strategic Review, all support functions, that is, Finance, Human Resources, Risk Management, Commercial Services, Information Management, Business Strategy and Communications fell under Distribution, together with Engineering and Customer Services, headed by the General Manager. The Strategic Review sees all the support functions as well as Customer Services function fall under different Divisions. KZN Distribution will now be responsible for Wires business only, still headed by the General Manager.



The Transmission Steps

The early Natal transmission network mushroomed along the railways lines and away from the power stations. When the capacity of Colenso Power Station was increased to 165 MW in the 1950s, Transmission lines radiated out from Colenso along the Trans-Natal Main line, going south down to Mason's Mill (near Pietermaritzburg) and northwards towards Glencoe. This network comprised of 88 kV lines that are still in service today, twelve substations supplied off the two lines were required to electrify the railway line between Pietermaritzburg and Glencoe.



Transmission lines were built down the coast as far as Port Shepstone when Congella became the power source of the Natal South Coast. Again the 88 kV lines radiated outwards along the railway line towards Pietermaritzburg with the intention to couple Congella to Colenso Power station. The original intention of the railways was to electrify the line between Cato Ridge and Glencoe but due to costs only the portion from Pietermaritzburg was done. In 1932 the portion of the Trans-Natal between Cato Ridge and Mason's Mill / Pentrich was electrified and the portion between Cato Ridge and the Congella Marshalling yards was electrified in 1937.

Umgeni Power Station was integrated into a 132 kV network that was established in the area. The main transmission voltage was 132 kV and lines radiated outwards towards Georgedale up the Natal North Coast to substations such as Driefontein and Stanger. Georgedale became the node that coupled the new network at 132 kV and the existing infrastructure that operated at 88 kV.



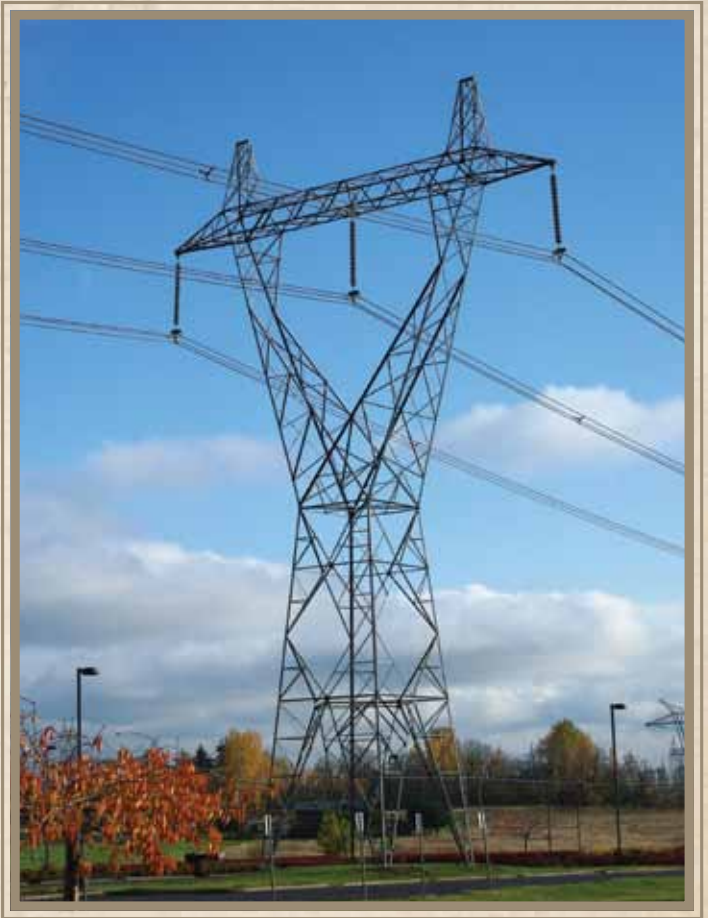
With the development of technology and time, it made small power stations unviable. To make use of the economy of scales, power started to be generated near the coal fields as opposed to near the load. Getting the electrical power to the customer became more reliant on the power line network. In Eskom, the use of 275 kV voltages as a transmission voltage was introduced with the building of Highveld in 1957. One 275 kV twin bundle conductor line had six times the capacity of the conventional 132 kV lines that were in operation at the time.

When Ingagane was commissioned, it was coupled to the existing network with the introduction of 275 kV transmission lines that ran down the western part of the province between Ingagane and

Georgedale. To accommodate the injection of 275 kV, Georgedale was extended with a 275 kV yard in 1964. The two lines between Ingagane and Georgedale were the first power lines in Natal operating at a Transmission voltage (as classified today voltages > 132 kV). The status of Georgedale was further elevated when the Control Centre for the Natal Undertaking was established at Georgedale in 1964.

To strengthen the power supply to the Natal Undertaking, the first 400 kV lines into Natal were constructed to couple the Natal network to Camden Power Station. Although it was the intention when Escom was established to have an integrated network it was only in 1970 that the Natal and Rand Undertakings were integrated with the coupling of Camden Power station to Chivelston using the two 400 kV lines.

The early 70's saw the extension of the 400 kV network from Chivelston to Mersey near Pietermaritzburg as well as the extension from the Pietermaritzburg area to Empangeni using a 275 kV network and the establishment of Impala. By 1973, just over 1 700 km of power line at 275 kV and 400 kV had been commissioned and the following substations with Transmission voltages had been established; Ingagane, Chivelston and Bloedrivier provided the injection into northern Natal, Chivelston was the coupling of the 400 kV and 275 kV networks. Bloukrans was established near Colenso to provide an injection into the Midlands. With the establishment of 400 kV and 275 kV at Mersey in 1970 and with its centralised network location, Mersey became the central and most important node in the Natal network. Also in 1970 two lines also went from Mersey to Empangeni to establish an electrical supply at Empangeni. The supplies to Durban were strengthened by the creation of Klarwater in 1973 and those to the Central Drakensberg when Tugela substation was built with lines from Bloukrans.



The Natal South Coast and the Durban South area were strengthened with the introduction of Illovo in 1979. Newcastle town also became a major industrial node and the supplies to the town and major industries were supplied from the new built Incandu substation.

In 1982 using one of the old 275 kV Ingagane Geogedale lines Danskraal was established to supply Ladysmith and surrounding areas.

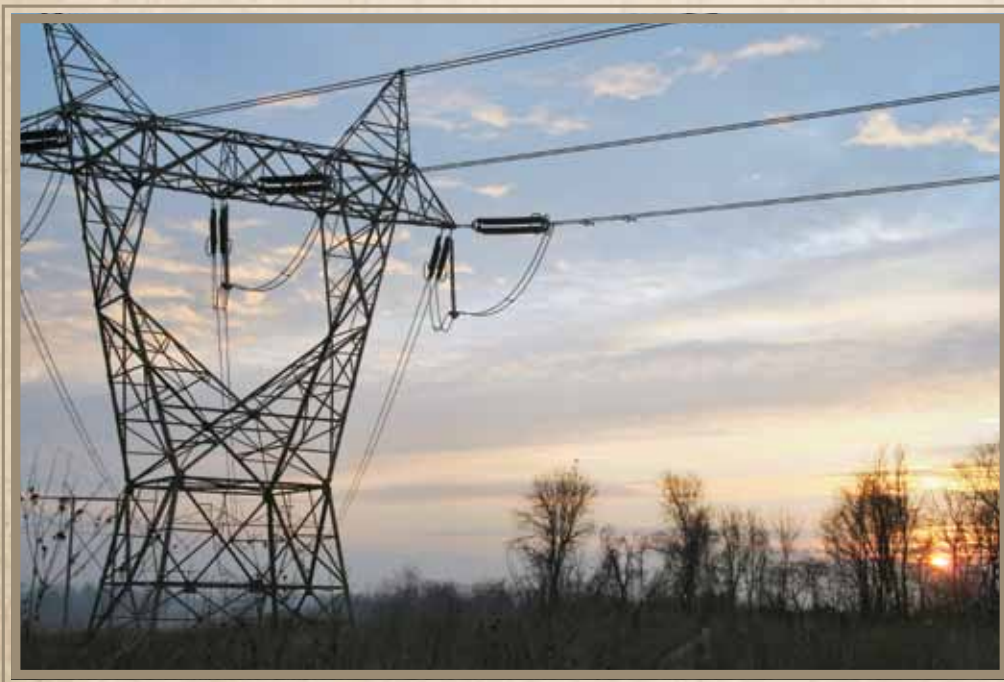
To allow for better integration of the lines that in the future would have to be erected to get the power down from the Generation Pool near Witbank and the loads/customers in Natal, a new node was created near Dundee. Unlike the other substations, this substation did not have any transformation and was created as a nodal point for the 400 kV network. The station was commissioned in 1981 to integrate the original lines between Chivelston and Mersey, a new in-feed from Tutuka Power Station. To ensure a reliable supply to Drakensberg when the station was in pump mode and to provide injection points when evacuating the power when in generation mode, Drakensberg Power Station was coupled to Pegasus and Mersey substations using two newly constructed 400 kV lines.

The Empangeni load grew due to the industrialisation of the area and the new Alusaf aluminium smelter. The establishment of Richards Bay Minerals, a smelter load and the low fault levels in the area, it necessitated the strengthening of the local Empangeni network. The strengthening came in the form of 400 kV lines, the source being Camden Power Station and coupled to the Western corridor. To facilitate this expansion as well as to create injection supply points for the railway line from Ermelo to Richards Bays, three new substations were built. The first was Normandie commissioned in 1982, located near Piet Retief, the second substation that was to become a critical node for the traction line was Umfolozi, near Ulundi which was commissioned in 1983. These two stations were originally supplied with one 400 kV line from Camden. A new 400 kV line to link Pegasus and Umfolozi was built to provide the second source to the Northern corridor. Two 400 kV lines were then built from Umfolozi to the new Gas Insulated Substation (GIS), Invubu, that was put into service in 1984. The two lines did a dog leg around Melmoth instead of taking a direct route. The railway

line that this network supplied was to become the main arterial route for the export of coal from the coal fields. The expansion of the Northern corridor to Empangeni, the integration of Drakensberg and the additional incomer from Tutuka took the Natal Transmission network to 3 170 km of power lines at Transmission voltages.

In the late 80's the supply to Durban needed to be strengthened as well as the Natal North Coast. In 1988, Avon was built and commissioned near Stanger. The integration of this new substation was done by breaking in the Mersey-Impala lines and required very short pieces of line to do this.

As the Natal network grew, a new major node needed to be created in the Western corridor. The new site chosen was outside Escourt and the new substation Venus was commissioned in 1991. The new station coupled the existing 275 kV lines with the 400 kV line from Drakensberg. As more 400 kV lines were required to supply the Natal load they were terminated into Venus. Majuba the new power station established near Volksrust on the border with Natal provided two new 400 kV lines into Venus and thus made Venus the central nodal point of the Natal network taking over from Mersey. By 1993 the Natal network was consuming about 3 600 MW and had been expanded to over 3 700 km in 400 and 275 kV power lines.



Initially the engineering used in the development of the Natal network was sourced externally (foreign), however with time Eskom developed these skills, in overhead power line design and now boast a number of initiatives. The Kwazulu-Natal network has been a breeding ground for a number of these developments and in cases where it's not the initial area where the innovation is introduced, it normally is the one that it's followed up in. After proving successful as a new form of structure for a 765 kV line, the guyed "V"

structure was developed for 400 kV, and the Majuba-Venus lines were one of the first lines to make use of the guyed "V" structure at 400 kV. As will be highlighted later there were other developments where the Kwazulu-Natal network featured prominently.

In 1991 there was a major business restructuring and the control of the transmission network was assigned to the newly formed Transmission Group. Transmission officially came into existence on 1 January 1992, but it had already come to life a few months earlier, in that there were already some permanent employees and recruitment taking place inside the group with its own HR & Departmental Managers. The structure for Transmission was broken down into three areas and each Area into Sections. The Natal Main Transmission System (MTS) was operated by the Natal Section, one of two for the Area. The area was a combination of the Free State and Natal into a unit known as NOFS (Natal Orange Free State) from the old names for the Provinces.

Local Transmission staff were involved extensively and predominant in the initiatives to improve the performance of the MTS network. Some of the more recognised initiatives are; Cane fire and veld fire management and mitigation research, cane free servitudes, bird interaction and pollution mitigation. Over the years the number of faults on the MTS has been reduced from 500 faults at its highest in 1992 to an average of 130 per annum now in the 2010's. As the

network grows the exposure is increased and when considering the performance in terms of faults per 100 km of line, the network performance has been improved from 12.5 faults per 100km to an average of 2.4 faults per 100 km in 2011.

The Richards Bay and Empangeni area were booming and the aluminium smelter wanted to expand and more than triple its output. To accommodate the additional load of 800 MW, a new substation was built near Empangeni and in 1995, Athene was commissioned that integrated existing 400 kV lines and required an additional in-feed from Pegasus. The load increase also required the completion of the planned injection into Pegasus from Majuba. The new lines from Majuba to Pegasus and from Pegasus to Athene made use of the new cross-rope structures, which use 50 % less steel and quicker to erect.

It wasn't only in the Empangeni area that the load was increasing, the load around the greater Durban and Pietermaritzburg areas as well as the Natal South Coast and Transkei were increasing and the network had a major expansion done. By 1996, a further two substations were commissioned, Hector in Hammersdale brought the 400 kV supply closer to the Durban load and Ariadne in Thornville, allowed for the strengthening of the South Coast and the Pietermaritzburg area. These two stations were linked through a ring feed between Venus and Mersey.

The supply to the Natal South Coast was constrained and required additional strengthening. The strengthening was also needed to the Eastern Cape north of Butterworth. A new substation was built near Harding to provide the strengthening to Port Shepstone on the coast and Kokstad inland. Eros was commissioned 1998, using one line from Ariadne. There were a number of servitude constraints along the route and the 132 kV Distribution network need upgrading, the new line made use of a Multi circuit structure. This structure was specifically developed for this line where the structure carries one 400 kV and one 132 kV circuit.

In 2004 the aluminium smelter in Richards Bay again made further expansions to its production line that required the increase in power consumption. To accommodate this growth a new 400 kV line was built from Pegasus to Athene. By 2006 the load across the Kwazulu-Natal had grown to the region of 6 600 MW, and this put it at the transfer limit of network at that time. MTS network needed a major strengthening program and this brought about the start of the introduction of 765 kV to the region. The 765 kV super grid will comprise of two legs starting at the generation pool near Majuba and terminating one in Empangeni and the other in the area between Durban and Pietermaritzburg. These two 765 kV stations will be coupled together with 400 kV lines and integrated into the existing 400 kV network. The proposed network strengthening is only planned for completion in 2015 but some of the proposed network has been constructed with the commissioning of a portion of line between Majuba and Umfolozi in 2010.



3. Eskom KZN boundaries

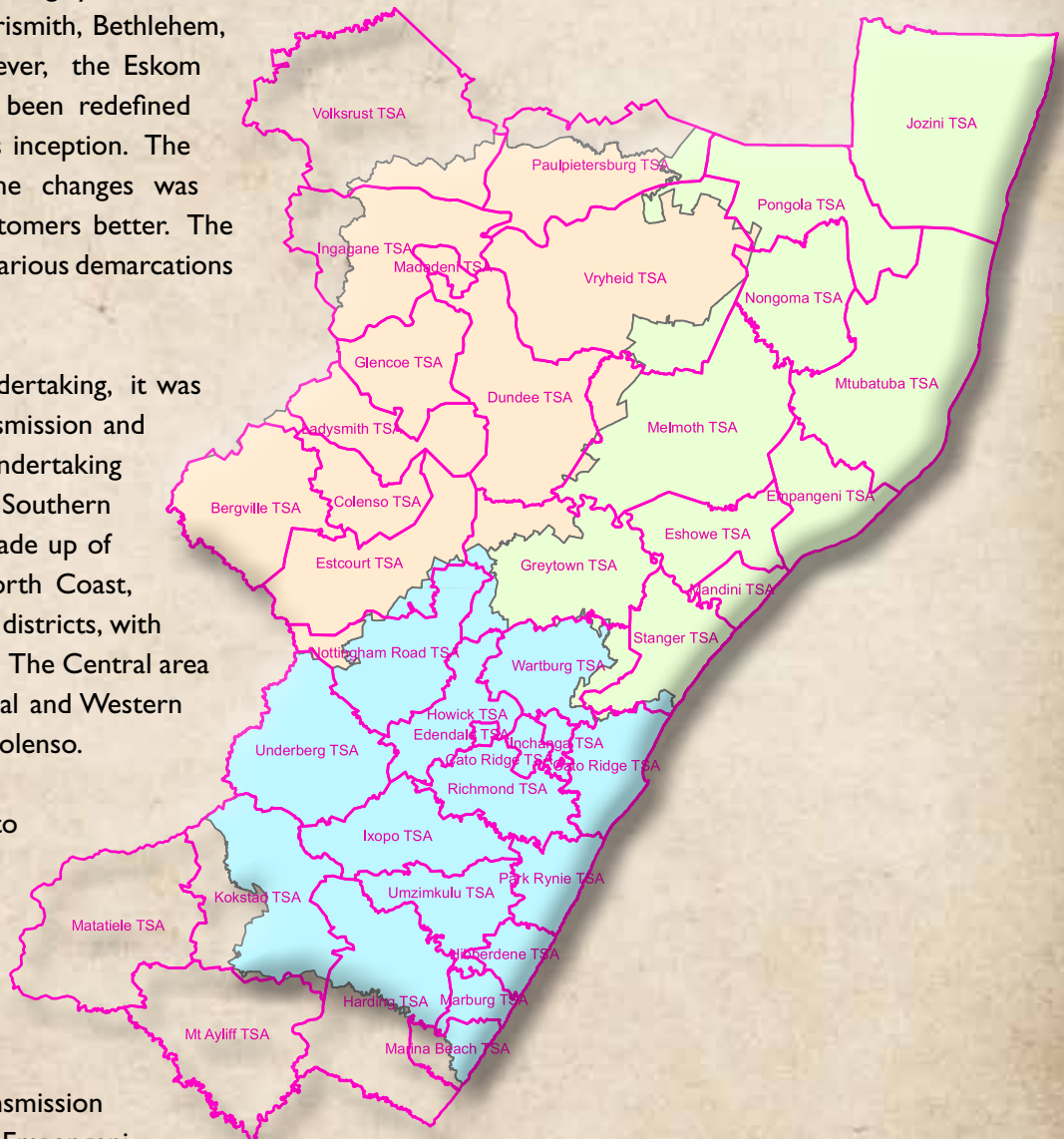
The KZN provincial boundary has largely remained unchanged over and included Harrismith, Bethlehem, Memel and Vrede areas. However, the Eskom boundaries and structures have been redefined a number of times since Eskom's inception. The common thread through all the changes was Eskom's desire to serve our customers better. The maps, on Annexure I, depict the various demarcations over the years.

Starting as the Natal Central Undertaking, it was responsible for generation, Transmission and Distribution in the region. The Undertaking was managed by the Central and Southern areas. The Southern area was made up of the Zululand, Pinetown and North Coast, South Coast and Pietermaritzburg districts, with the head office at New Germany. The Central area comprised the Northern, Central and Western districts with the head office in Colenso.

The region was then split into Eastern and Western Natal regions in 1986, each with a number of districts. The Generation element was hived off to the Generation Group, and the Region was only accountable for the transmission and distribution of electricity. Empangeni, Eshowe, Pinetown and Margate districts fell under Eastern Natal. Western Natal was made up of the Newcastle, Ladysmith and Pietermaritzburg districts. The districts were self-contained and each had a fully-fledged support structure. Both Eastern and Western were headed by Regional Managers at the time. It was also during this period that the Transmission element was moved from the Regions into the newly created Transmission Division in 1991/2.

When Eastern Region came into being, it was split into Inland and Coastal, serving the Distribution Division. Newcastle and Pietermaritzburg made up the Inland area whilst Empangeni and Margate made up the Coastal area. The whole region then amalgamated into one but retained Newcastle, Pietermaritzburg, Empangeni and Margate as areas.

Current changes see the formation of three Zones viz. Empangeni, Newcastle and Pietermaritzburg. The Customer Services Division will align to these Zones but discussions are still underway on how best to structure in order to serve the customers more effectively.



4. Current KZN operations

With the decommissioning of Colenso, Ingagage, Umgeni and Congella power stations, KZN currently has one operational power station, Drakensberg Pumped Storage Scheme, with Ingula expected to come on line in 2014.

The map below depicts the high voltage lines that serve the Province. Four customer load networks (CLN), located in Pinetown, Empangeni, Newcastle and Ladysmith are responsible for the different networks. The customer base has increased exponentially over the years, with about 50 000 customers in early 90s and over 700 000 customers at present. Included in the customer base are 12 Key Customers (KSACS) which include Richards Bay Minerals, Hillside and Bayside Aluminium, giants in the mining sector. Redistributors, including one Metro (eThekweni) account for 80 per cent of KZN Distribution revenue. Four Customer Service Areas and Field Service Areas (FSA) located in Margate, Pietermaritzburg, Newcastle and Empangeni oversee the customer needs in the respective areas.

At a glance, the statistics of KZN are outlined below:

Generation

- Power Stations 1
- MW installed 1 000 MW

Transmission

- Load demand 6 703 MW
- Number of MTS 23
- No and km of EHV lines 64 lines and 4 755 km
- Number of CLNs 4
- Annual Sales KSACS 18.9 TWh (R5.9 bn)

Statistics

- Number of customers served 724 523
- Number of substations 431
- Number and km of HV lines 244 lines and 6 628 km
- Number and km of MV feeders 1031 lines and 4 5204 km
- Annual Sales (Jan 2012) 22.183 TWh (R11.79 bn)

Details: KZN OU and KSACS Sales and Revenue Distribution

- Geographic area 1 13283 km²

Economic activity (%)

- Redistributors (80.6) Commercial (5.1)
- Residential (3.6) Prepayment (3.3)
- Industrial (3.0) Agriculture (2.9)
- Mining (1.0) Traction (0.5)

Customer Network Centre (CNC)	40
Walk In Centre (WIC)	16
Technical Service Group (TSG)	5
Regional Distribution Centre (RDC)	6

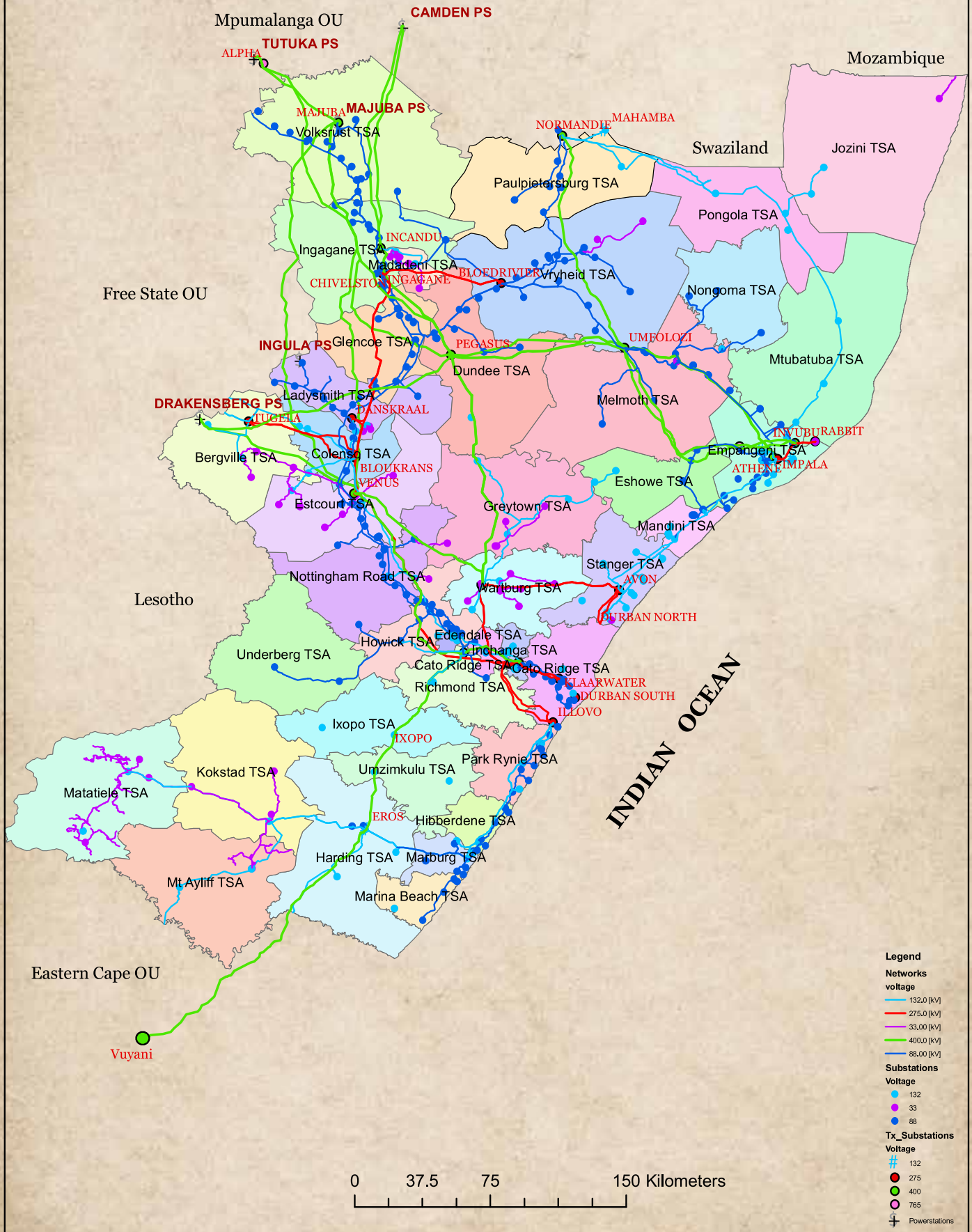
Customer Perception

Customer satisfaction is an important indicator of how the province is faring in its service delivery. As such, monthly customer satisfaction surveys are conducted to gauge service levels and to ascertain the areas that need improvement. The service levels have fluctuated between very good, good and average over the years, as the customer base increased. However, through concerted customer education campaigns, weaknesses are being addressed and the levels are picking up again. There is now a higher understanding, among both office based and field based employees, on the need to put customers at the centre of the work they do.

October 1997 saw the opening of the Eskom Contact Centre in Westville, Durban. This was the pilot site of the seven Contact Centres that are operational throughout the country. In its infancy, the Westville site had received on average approximately 40 000 incoming calls per month. The Contact Centre opened with a staff complement of 40. Through the years, we had witnessed a gradual increase in the volume of incoming calls and we currently receive, on average, approximately 70000 incoming calls per month. The current staff complement is about 110. We pride ourselves in providing excellent customer service and this is evident in our Customer Care ratings. By prioritising training and coaching we ensure sustainable service delivery. We have also increased the number of quality assessments conducted per staff member to ensure that our high quality standards are sustained. In line with continuous improvement in 2003, all 7 Contact Centres in Eskom started to operate virtually, Our Contact Centre operates on a business model that places the customer at the centre of our business.

Kwazulu Natal OU

Powerstations and HV Lines & Substations



5. Fulfilling the Eskom mandate

Eskom is the economic lifeblood of the economy. Since inception, Eskom's vision has focused on enabling sustainable economic growth and improving people's lives. The Eskom purpose, "To provide sustainable electricity solutions to grow the economy and improve the quality of life of people in South Africa and in the region" underpins all that Eskom KZN does. Alignment towards these strategies has been shaped through living common shared values – Eskom values, which are Zero harm, Integrity Innovation, Sinobuntu (Caring), Customer Satisfaction, Excellence. To this end, the following initiatives have been implemented in the province.



Edgar Wohlberg, the then General Manager, is seen with Keith Westermeyer celebrating the Peacetown energisation

a) Electrification

Electricity has drastically transformed the lives of KZN citizens. Prior to 1986, Eskom's direct customers were mainly redistributors and farmers. Today, about 730 000 residential customers are included in the customer base in KZN.

The first electrification area in KZN (and possibly in the whole of South Africa), was in Peacetown outside Ladysmith, around 1987. The project was completed in about 1989. There was much focus on the project, with several functions being held to show the community that Eskom had their best interests at heart. Lessons learned were shared with other Areas and other Regions. All work was done in-house using conventional technology.

The strategy around electrification involved focusing on densely populated areas so as to cover as many households as possible in a single project. At that time, the thought of electrifying 300 households a year was considered impossible. However, in the early 90s, the figure rose to 6 000 households a year and the numbers grew to 50 000 households per year between 1996 and 2000.

In spite of all the electrification programmes currently running, KZN has one of the highest number of unelectrified households (about 700 000) in the country. Joint efforts between Eskom and the Department of Energy (DoE) are needed to attain the government's goal of universal access to electricity. There is nothing as gratifying as changing people's lives for the better as is evidenced in the pictures below.



Umlalazi switch on by MEC Dube



Nyokeni Substation Launch

b) CAPEX Projects

A number of refurbishment and strengthening projects are in progress to ensure better electricity delivery to the people of KZN. Eskom contributes to job creation in the Province through the use of local labour in the execution of our projects.

Below is a summary of some of the high cost projects.

Gingindlovu Substation and Line

This project entailed the construction of a new 132/88 kV substation housing two 80 MVA transformers. The North Coast sub-Tx system between Avon, Mandini and Empangeni reached its capacity, and there was a need for a new injection in the Gingindlovu area to cater for the expected load growth. The project had been commissioned in September 2011. The total cost of the suite was R127m.

Pomeroy Suite

This was a rural electrification project funded by the Department of Energy (DoE). The project started in February 2010 and was due for completion in April 2011. The project had been commissioned in September 2011. The value of the complete substation and line suite was R57m.

Mzintlava Suite

The project was to build approximately 500m 132kV turn in lines with two towers and 300m of Substation access road. The project was funded by the Department of Energy to the value of R41m. The project had been commissioned in March 2012.

Kenterton Suite

The project involves the construction of 43 km of 132kV Kingbird line from Umzali substation and a new 132/22kV 20MVA substation at Kenterton. This is a rural electrification project funded by the Department of Energy (DoE). The project started in September 2011 with planned completion in September 2012, however due to prolonged negotiations for the servitude, the projected completion date is now December 2012. The value of the total suite is R94m.

Corinth Suite

The project involves the construction of 43km of 132kV Kingbird line from Umzali substation and a new 132/22kV 20MVA substation at Corinth. The project started in September 2011 and is due for completion in December 2012 is funded by the Department of Energy to the value of R102m.

Ncwane suite

The suite consists of an 88/88kv switching station and a 27km of 88kv line built in Kingbird conductor. The switching station will provide firm supply for the greater Ulundi Nongoma Hlabisa area and improve the 88kv voltage regulation at Nongoma substation. The project started in June 2011 and is due for completion in December 2012. The value of the suite is R53m.

Madadeni Suite

The project entails the installation of 2 x 132/33kv 40MVA transformers, 2 x 132/11kv 20MVA transformers and the construction of a 13km of 132kv line from Incandu to Madadeni substation on lattice steel towers. The value of the suite is R90m.

Mathondwane Suite

The project entails the establishment of a 1 x 88/22kv 20MVA substation and 11km of 88kv line and associated MV turn-in lines. The project started in April 2011 and is due for completion in September 2012. The value of the suite is R40m.

c) Corporate Social Investment (CSI)

Eskom Development Foundation carries out Corporate Social Investment programmes on behalf of Eskom, focusing on initiatives for education, skills development, poverty alleviation and job creation.

In KZN, the Foundation granted overall funding to the value of over R2m during the last financial year, impacting 25 024 beneficiaries:

- R255 000 to various philanthropic causes (schools and welfare organisations) - impacting 22 049 beneficiaries;
- R585 881 to strategic donations (schools and various other organisations) - impacting 2 660 beneficiaries;
- R1 078 399 in social development to schools and welfare organisations - impacting 305 beneficiaries; and
- R81 456 in small enterprise support - impacting 10 beneficiaries.

A few of the projects that have been funded, are illustrated below:

Elangeni FET College (kwa-Dabeka and Inanda Campus) was funded by the Eskom Development Foundation (purchase of electrical workshop equipment)



Mkabayi Children's Home, situated at Nqutu. The Eskom Foundation funded their mini library, playground equipment, desks and chairs

The Eskom Foundation funded Lilani Hot Springs, a Greytown lodge owned by the community, with furniture and linen



6. *The guardians who make it happen*

The province has a staff complement of about 3 500, of which about 160 are in managerial positions. The demographics have transformed greatly over the years, with women, black people and the youth joining the organisation in huge numbers. Employment equity sits at about 54%, with some divisions, like Finance, sitting at 60% over the past 6 years. Women in managerial positions have increased drastically from less than 10 in the early 90s to over 45 presently. It is in the diversity that the province draws its strength.



Willy Bull

420 employees have served for 30 years and over, to a total of over 14 000 years! Of special note is Willy Bull who has been with Eskom for about **42½ years without taking a single day of sick leave**. Such levels of dedication and commitment are a source of inspiration to the young and old alike. The skills gained over the years have anchored the province to perform exceptionally well over the years. The ability of experienced staff to transfer such skills will help sustain the high performance levels. In order to facilitate such skills transfer, extensive mentorship programmes are in place.

Institutions like Mersey Training Centre, which trains approximately 840 students annually offer valuable means

of internal skills transfer. Mersey trainees come from internal technical departments as well as from Eskom contractors. Currently the training is geared towards the Distribution business, but will soon cater for all divisions. Other provinces, like the Free State and Eastern Cape have benefited from the courses on offer. The trainers, instructors and assessors are from both within Eskom and external.



Mersey Training Centre



Creating a healthy workforce that strikes a balance in all areas of their lives is critical for maintaining high staff morale levels. As a result employee wellness is a huge focus area. A lot of emphasis is given to prevention programmes as well as reactive support where needed. Various activities are in place to improve employees' health, reduce stress, increase fitness levels and improve work-life balance. Sports and social events also bring the teams together and help foster better working relationships.



In order to encourage creativity and improve performance levels, a number of awards that stimulate healthy competition among employees are in place. These include, driving competitions, best CNC, best Customer Service Area, best leader etc. Such awards have resulted in outstanding teamwork as well as remarkable housekeeping standards as teams vie to win.



7. Guardians of yesterday and today



Alex Ndlela
(Snr Manager Maintenance
and Operations)




Keith Westermeyer
(Middle Manager SHEQS)



Azwi Mamanyuha
(Senior Manager
Asset Creation)




Ian McFadden
(Manager
Technical
Support)



Mike Pallet
(Middle
Manager
Network
Planning)



Jayalakshmi Govender
(Snr Manager Finance)



Charles Clark
(Middle Manager
Risk Management)




Baba N Nkomo
(Asst Technical Official
Field Services)



Pool Mahadeo
(Snr Manager Customer Services)



Ganda Mlaba
(Asst Technical Official
Field Services)



Peter Craig
(General
Manager in the
office of the GE)




Kenny Venkatesen
(Retiree)



Rob Ferguson
(Manager Network Management)



Mphiliseni Mthimkhulu
(East Grid Senior Manager)



Nick Nicosia
(Retiree)



Vijay Shamsunder
(Middle Manager Network Management)



Lyn Dorling
(Retiree)

8. Guardians weather the storms for customers' sake

KZN is prone to extreme weather conditions, ranging from snow storms, to lightning, to gale force winds and heavy rains, that negatively impact Eskom's electricity delivery. In such cases, power interruptions are inevitable, leading to customers experiencing extended periods without power. Eskom teams have always rallied together to restore power within the shortest possible periods.

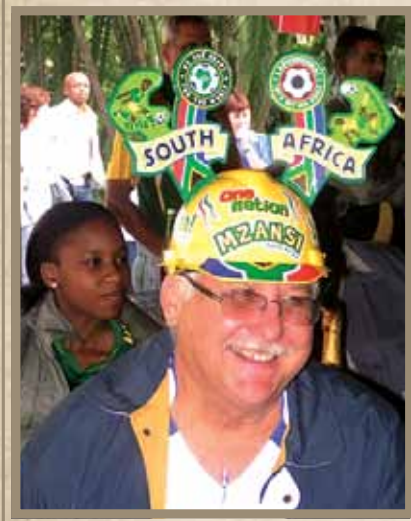
Through the Guardians' dedication and empathy for customers, restoration of supply has happened in record times in most instances. Working around the clock is the order of the day in such situations. The pictures below say it all.



The KZN leadership is proud of the calibre of employees in the province and applauds them for their devotion. There is continuous research into the best technologies to employ to curb customer interruptions due to snow storms, severe winds and salt water on insulators. Customer satisfaction is at the heart of the province's operations.

9. Some of Eskom KQV's highlights

2010 FIFA World Cup



The success of 2010 World Cup was attributable to the excellent team work displayed by all role players. It was this spirit of oneness and hardworking that raised the Eskom flag high and in turn the South African flag high.

The preparations took almost four years. In 2006, the Association of Municipal Electricity Undertakings (AMEU), Department of Minerals and Energy (DME) and Eskom established a joint forum to share information and help co-ordinate requirements to ensure that the 2010 FIFA Soccer World Cup was hosted successfully without major problems with electrical infrastructure.

This led to the establishment of the Regional Electricity Task Teams (RTTs) in 2008. RTTs were made up of Host City Metros, Municipalities, Local Organisation Committee (LOC), Eskom and other interested parties. Their mandate was to provide an oversight and decision making role on ensuring a reliable and

continuous electricity supply, mitigation of risks and electricity supply chain preparedness to ensure a successful 2009 FIFA Confederations Cup and 2010 FIFA Soccer World Cup events. Kurt Dedekind (Distribution) and Sifiso Mazibuko (Transmission) were the provincial representatives on the local team.

The RTT's insight and hard-work led to all regions achieving readiness status by May 2010. Simulation exercises were conducted to test the readiness, and all of them excelled. The MDs Distribution and Transmission signed off the regions' readiness in May 2010.

The Regional Situational Awareness Centre (RSAC), was established to keep a close watch on all games, key installations and stadia, to make sure Eskom responded to any incidents efficiently and effectively. The RSAC was multi divisional and multi-disciplinary, which ensured focused coordinated efforts from the province.



Climate Change Conference of Parties (COP17)

Durban hosted the international climate change conference, better known as COP17 from 28 November to 9 December 2011, which attracted 15 000 delegates and a total of 20 000 to 25 000 visitors to the city over that period.

COP17 was an inter-governmental event, meaning that representatives from 194 governments were in Durban.

Eskom in general, and Eskom KZN in particular, set up teams to ensure security of supply during the event. The Security of Supply Platform was headed by Peter Craig, with Devan Nardhamuni heading the OU Security of Supply work-stream which included Transmission and Generation, Security Services, Communications, Control and IDM at a provincial level.

Again, an RSAC was established to ensure the province's ready response to any supply threats and challenges.

The conference was hailed as a success, and for Eskom KZN, it highlighted the benefits of teamwork.



Management committing their pledge to climate change

Safety Achievements

Most of the field based employees operate in high risk areas in terms of safety. The terrain and work environment they operate in, expose them to safety incidents. Vigilance and great team spirit is needed to protect oneself and one's colleagues from unsafe, dangerous situations. It is against this backdrop, that the province celebrates the Customer Network Centres (CNCs), previously Technical Service Centres, and Customer Load Networks that achieve multi-year periods without disabling injuries.

Drakensberg Power Station achieved 12 NOSCARS in a row, this was for the years 1999 until 2010. The exceptional teams in this regard, are highlighted below:

CLN Safety Performance to date

Current Date	02 Jul 2012				
	Ladysmith	Pinetown	Empangeni	Newcastle	Grid Office
Last LTI	04 Oct 2010	17 Mar 2012	18 Sep 1998	02 Aug 2009	01 Jan 1992
Days worked	637	107	5036	1065	7488
Next Milestone	1000	500	5500	1500	7500
Milestone Date	30 Jun 2013	30 Jul 2013	09 Oct 2013	10 Sep 2013	14 Jul 2012



10. *Some interesting facts from the Eskom of yesteryear*

Salaries

Lyn Dorling (retired) – *I started working for Eskom in 1946 at a salary of £4 and 6 shillings and 4 pence per month. This was less than what I had to pay for board, so my parents subsidised my income”*

Edgar Wohlberg (retired) – *“I started in 1951 at a salary of £41 per month.”*

Nkomentaba Nkomo – *“I started in 1967 at a salary of R6.24 per week. which rose to R40 per month in 1970. I educated all my children through the earnings I got from Eskom.”*

Sheila Brown – *“Although Eskom women were allowed to occupy positions of seniority (supervisory, not management), they were paid less than their male counterparts. Parity of pay between the genders was only achieved in the early nineties.”*

Priscilla Rudnick – *“My starting monthly salary was only R175 per month and my monthly train ticket from Springs to Johannesburg every day, cost me R5 a month.”*

Nick Nicosia – *“I started in Eskom in 1938 at Rosherville Power Station in Transvaal as a Fitter and Turner, earning, R4 a month. At the time of going on pension from Eskom I was one of the highest paid Fitter and Turner earning approximately R1000 a month. As a pensioner Eskom continues to pay 60% of my medical aid which is much appreciated. The downside is that the pension contribution is too low and unsustainable.”*

Equipment/ Working Tools

Lyn Dorling (retired) – *“We carried out line patrols and meter readings on horseback.”*

Ganda Mlaba – *“There was no equipment except wheelbarrows and shovels. We did all the digging and carried steel pipes manually.”*

Sheila Brown – *“In the Customer Accounts Section, there were no computers, and even calculators were not allowed. All adjustments or recalculation of bills were done manually, on scrap paper pads (produced by Printing), and then verified by supervisors. Meter readings (taken monthly by our own Eskom Meter Readers) were processed onto punch cards, and customer bills were printed on carbonised paper, with copies bound into ‘books’ for record-keeping in huge cabinets. Archived records were kept on micro-fiche, and micro-fiche viewers were in short supply. All the customer and premise details (like meters, readings) were recorded, manually, on large cards which were filed in Installation number order by reticulation codes, and one got into big trouble if a card was misfiled or went missing.”*

Mbuzeni Mtshali – *“My first job was to make a coal fire for electricity production. It was hot and there were no tools, so one needed lots of physical strength to manage.”*

Priscilla Rudnick – *“Printing machines were replaced by photo-copier machines. Telex machines ceased to exist eventually, being replaced by e-mail. The old electric typewriters that we were using when I joined, were replaced by brand new IBM typewriters (it was a normal electric typewriter with a mini-memory built in), and these were also replaced again by computers, which became more and more grand and were updated gradually to what we are using today.”*

[Rob Ferguson and Lyn Dorling pointed out that spouses were unpaid employees of Eskom, as they answered business calls at home, around the clock.]

Mike Pallett – *“When I called out from my desk to my secretary: ‘Jenny, can you bring me the file about Smith, or was it Jones? You know the one we had a problem with in Estcourt. Or was it Mooi River?’ - and she appeared a minute later with the correct file ... THAT’S A USER FRIENDLY filing system!”*

Kenny Venkatasen - started working for Eskom on 1 June 1988 as District Financial Accountant in Eshowe where he had to live in Hotel Edwards for almost a year living off a suit case and a year later move into a single roomed Hut house on the outskirts of Eshowe which had no toilet and kitchen facilities. During early 1990’s Eskom introduced quality circles to improve the technical standards and improve safety and customer services. Eshowe District office produced internationally recognised equipment such as the climbing irons under the leadership of Rob Fergusson who was the Maintenance Superintendent at that time.

Nick Nicosia - *“The working conditions back then were very unsafe and dirty. We had no safety gear and had to work under noisy, dusty conditions.”*

Achievements

Sheila Brown – *“At the end of September 1979, a celebration was held in Customer Accounts to mark the milestone of reaching R13 million for the month, achieved by Sales Revenue.”*

Kurt Dedekind – *“The region was nominated for the Chairman’s Award for achieving 6 000 household connections in the early 90s.”*

Priscilla Rudnick – *“Shortly after I started my working career in April 1972 at Escom, we were all issued with laminated gold pens to celebrate the Electricity Supply Commission’s 50th Birthday ... I cherished this pen all my life and never used it for fear that I might lose it.”*

Kenny Venkatasen - With the reorganisation of Eskom, integration of Eastern and Western Eskom Region merged resulted in a single Provincial unit. Due to the changes required Kenny was moved to Sales Department assisting pricing and quotes for new electricity applicants. During this period he was also involved with Tongaat Hulett Group to support it with the development of the biggest irrigation scheme in the Southern Hemisphere in the area of Empangeni called the Heatonville Irrigation scheme. The electricity pricing challenge in this project was to introduce a standardised tariff as an input cost for sugar production. Engineers had major challenges to plan networks which were required to handle 1MVA pumping load to the three large balancing dams. The initial oak line failed resulting in the construction of twin oak lines. The pricing of electricity to approximately 16 local farmers was eventually accepted after many deliberations. At that stage Peter Prince, Technical Director of Tongaat Hulett and Theo Boshoff, the technical manager worked closely with me. In 1996 Kenny was accompanied by Thulani Gcabashe to receive “Allan Morgan’s “award for this contribution to the economy.

Fun

Rob Ferguson – *“The operative phrase was ‘work hard and play hard.’”*

Peter Craig – *“Eskom clubs were big, and were run by elected members and management nominees.”*

Keith Wood – *“We worked hard and played hard.”*

Nick Nicosia – *“We worked hard under strict management discipline in order to get the tasks done but were able to enjoy a spirit of family-hood and togetherness among our colleagues.”*

What Kept the Business Together

There was consensus among all those interviewed that honesty, trust and respect kept the business going. In Mr Wohlberg’s words, “There was very good team spirit all round, and this was based on two pillars of trust and respect. One should be able to sleep comfortably, knowing that the business is in good hands. The only way to have that comfort is if people are trustworthy”.

11. Words of wisdom from those that have been and those that are still here

- “We need to build and grow the customer base and ensure there is a robust revenue stream. Change is good for us, so we also need continuous revitalisation of the organisation, and we need to invest in infrastructure for the good of KZN and the country.” – Pool Mahadeo.
- “With Ingula Pumped Storage Scheme being in commercial operation, and the site being proclaimed as a nature reserve, I foresee an influx of visitors which will allow Eskom to showcase its commitment to engineering for sustainability, and emphasise how both electricity production and environmental conservation can co-exist. The development of ecotourism opportunities like walking and hiking trails, look out points and birding, will further enhance Eskom’s image.” – Avi Singh.
- “We need to work hard on training so we acquire skills to take the province to greater heights. We need to develop the mentality to help each other and develop skills so that we empower people. Managers should take the responsibility to grow their people. We also need to get closer to our customers.” – Keith Wood.
- “Employees, especially those at the depots, should work safe and do what they are told to do, and they will be safe at all times.” – Baba MW Zulu (retired).
 - “The best advice that I can give to the young Guardians of today, is:
 - Be honest and open in whatever you do;
 - Be proud of who you are and the job that you do;
 - Be the best in your job and you will enjoy doing your job well. Strive to better your capabilities wherever you can;
 - Be humble - respect other people’s views and always be ready to learn from experiences; and
 - Be loyal to your job, your manager, your peers, and the company that you work for.” – Priscilla Rudnick.
- “You need good management, dedicated staff that have respect for management and for each other, for continued success. There is also the need for a sense of responsibility and willingness to go the extra mile.” – Lyn Dorling (retired).
- “People working for Eskom should protect the public by making sure that they erect electricity structures correctly, so that Eskom does not have to pay out for negligence where people get killed by electricity. Eskom should continue to bring the Izinyoka to book, because they steal a lot of electricity.” – Baba DM Malumla (retired).
- “Eskom has a critical role to play in the country. We are the drivers of economic prosperity. Without adequate power the economy falters. With power available, the economy grows. I don’t see us as guardians. I see us as pioneers! We lead the way! We innovate! My hope for the future is that Eskom will radically de-centralise once again, and allow workers at all levels to take responsibility for their outputs. Devolve decision-making as low as possible. Upper management concentrates on strategy, and line staff concentrate on getting stuff done. You won’t believe what we will be able to achieve!!” – Mike Pallett.
- “To succeed at what you do, you need job satisfaction. This makes waking up and going to work easier. You need mentors in order to grow, and all that you do should be aimed at is pleasing the customer” – Edgar Wohlberg (retired).
- “Success is guaranteed if people are passionate about what they do. There will always be issues in the business, but one needs to keep focused on what one needs to do and deliver.” – Jayakashmi Govender.

- *“KZN needs to maintain its electrical networks in a good, healthy condition. This will be achieved through caring for people and so there is a need to continue to value our people. Improvement on the real-time controls is required in order to immediately detect poor performance-leading indicators. We must continue to instil a culture of aiming for no less than the best performance in all categories.” – Alex Ndlela.*
- *“We need to standardise and apply our minds to innovations that will take the business forward. We also need to share resources. Various components in the province need to work together for improved customer service delivery. We need to learn to do more with less, while expanding our networks and improving our customer service.” – Peter Craig.*
- *“I got here when I was young, got married, and educated my children all through Eskom. All I have achieved is through Eskom. Eskom is a great caring company, so youngsters should look after this company.” – Baba G Mlaba.*
- *“If you do not respect your managers, colleagues and the work you do, you will not get to the 44 years of service that I have achieved to date.” Baba N Nkomo.*
- *“The people that the province has, are its greatest asset for success. We have rallied together and managed well under crisis situations. We need to translate this into our daily operations.” – Kurt Dedekind.*
- *“For Eskom KZN to succeed, we need to deal with the challenge around sufficient supply of well trained and educated employees. Our contribution will be to work with the local education institutions to strengthen education and skills development. We also need to partner in offering post education training opportunities, and participate in informing the FET curriculum so that it is suitable for our environment and other utilities in general. We also need to work with law enforcement agencies and community leaders to deal with illegal connections and electricity theft so as to foster good citizenship.” – Mphiliseni Mthimkhulu.*
- *“Top managers should set the directions and help sort out problems, and let lower managers do the work. We need to stop micromanaging the people at the coal face. We should not attack staff but rather help them to perform better. People need to create fun for themselves, so that they enjoy their jobs” – Rob Ferguson.*
- *“Respect work, seniors, and co-workers, in order to stay longer in the organisation. People should use their money where it matters most, since Eskom offers the best benefits in South Africa.” – Baba Mbuzeni Mtshali.*
- *“KZN can proudly look back at its contribution and achievements in Eskom, and as we move into the future, our traditionally willing and proud workforce should continue to provide the necessary support to the organisation in pursuance of becoming one of the top utilities in the world.” – Keith Westermeyer.*
- *“Eskom is a successful and established force in KZN. The key issues looking to the future are the social deliverables, namely the electrification of about 700 000 households, and to deal with the problem of illegal connections that threaten our financial revenues, quality of supply, and liability to public safety.” – Charles Clark.*
- *“We need to work as a people who pull together, breaking through barriers and challenges that are before and around us, especially breaking through internal barriers ... of the mind and heart. We also need to esteem our greatest asset, the people.” – Nonhlanhla Gcabashe.*
- *“Eskom KZN has a crucial role to play in improving the lives of those living in KZN, particularly through the electrification programme. Together with water and telecommunications, access to electricity supply will facilitate improved learning, development of small business, easier life-style and living conditions, amongst other things. Hand-in-hand with the provision of electricity, Eskom must continue to promote the safe use of electricity.” – Vijay Shamsunder.*
- *“Eskom is like a marriage: ‘Love, Honour and Obey’. Love your work and do it to the best of your ability. Honour your promises and deliver with positive actions. Obey - respect and obey company rules, your manager and your colleagues, and above all yourself. That has been my focus during my career and this has proved successful.” – Willy Bull.*

12. GM's Vision for Eskom KZN

The General Manager, Sifiso Mazibuko envisions that Eskom KZN will become a model of success through:

- Shaping the economic landscape of the KZN province
- Creating strategic linkages with all our stakeholders for influence
- Giving our customers unprecedented customer experiences
- Creating a space for greener energy sources, and
- Creating a safe space for employees to excel.

In order to achieve the above, the GM has identified the following focus areas:

Kzn Operating Unit's Focus Areas

1. Becoming a high performance organisation.
2. Leading and partnering to keep the lights on.
3. Reducing our carbon footprint and pursuing low-carbon growth opportunities.
4. Securing our future resource requirements, mandate and the required enabling environment.
5. Ensuring our financial sustainability.
6. Setting ourselves up for success.
7. Pursuing private sector participation.
8. Zero harm to employees and the public.
9. Improving network reliability.
10. Playing an active role in UAP.
11. Seek efficiencies in operations and maintenance.
12. Prudently administrating Capex for effective asset management and ensuring that new infrastructure is aligned with economic development.
13. Being socially and environmentally responsible.
14. Exceeding the customer's expectation by always improving the experience with Eskom.
15. Growing and investing in Human Capital (internal and external).

He looks forward to the day when all KZN OU guardians will look back and say, we made it happen.

1.3. Conclusion

The massive provincial economic growth provides an opportunity for Eskom KZN to sustainably contribute to KZN's development and ultimately to the country's development. As the enablers, it's imperative that all divisions rise up to the challenge and play their role in making this a reality. The challenge is for every Guardian to take ownership of this.

To effectively 'guard' the province's economy, a Provincial Reliability Team (PRT), a multi divisional committee is currently in place. The PRT's mandate is to jointly manage electricity security of supply risks at a provincial level and implement initiatives that will improve the Eskom KZN's power system and power delivery to customers. A similar cross divisional team, made up of KZN Eskom senior managers is to be instituted to look at common operational risks. This will ensure that there is a holistic, integrated view of all risks that could negatively impact the province's development.

Traditionally, the culture of respect, honesty and trust has contributed to the high safety records that Eskom KZN enjoyed. Today, this is embedded in the Eskom Values and each Guardian needs to embrace these, for an aligned safe power delivery.

Building on relationships fostered over the years, be they internal or external relationships, will be critical for Eskom KZN's success. There is need for commitment in partnering to create a better future for generations to come.

The journey that begun 89 years ago, needs to carry on. The onus is on the current generation to make this happen. As such, the journey continues....

A tribute to Eskom ... a poem that says it all

**It's been 89 years and we're still standing,
delivering,
progressing ,
evolving,
changing, and
chasing after nothing but the best.**

We are Eskom and we light up your way.
It doesn't matter what the critics say,
come what may, we power up your day.
We are the engine that drives the economy,
the backbone of every company,
the life support of every clinic, hospital and industry.
We turn houses into homes, food into meals.
The young ones dreams are now a reality,
with every bursary and job opportunity,
because you see, over and above providing electricity,
we care for every community.

**We are Eskom and we light up your way,
It doesn't matter what the critics say,
come what may, we power up your day**

There's no need for fires, candles or match-sticks.

With just one click,
we speak a command:

“Let there be light!”

Just like that, we turn long hours of stirring and burning into instant:
instant porridge, instant pudding, every instant meal,
instant communication.

With no hesitation,
let us also not forget to mention,
the pioneers that lit up our nation.
Every guardian behind the Eskom brand,
working together hand-in-hand.

**For 89 years and we're still standing,
delivering,**

**progressing,
evolving,**

changing,

chasing after nothing but the best.

We are Eskom, we light up your way.

It doesn't matter what the critics say,

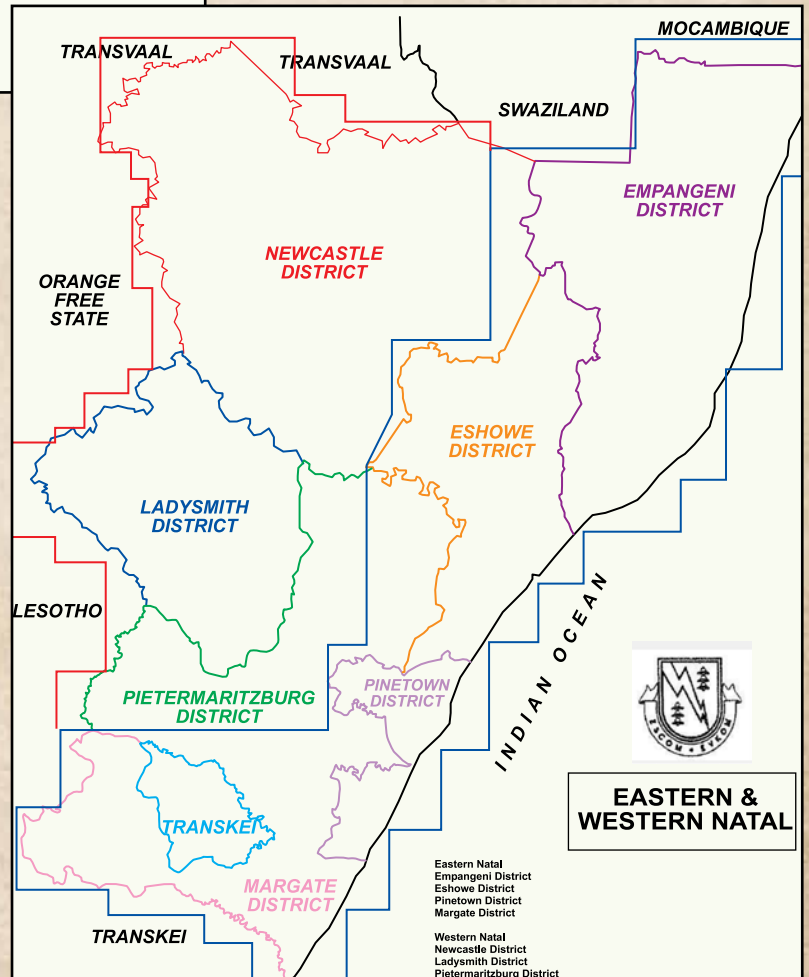
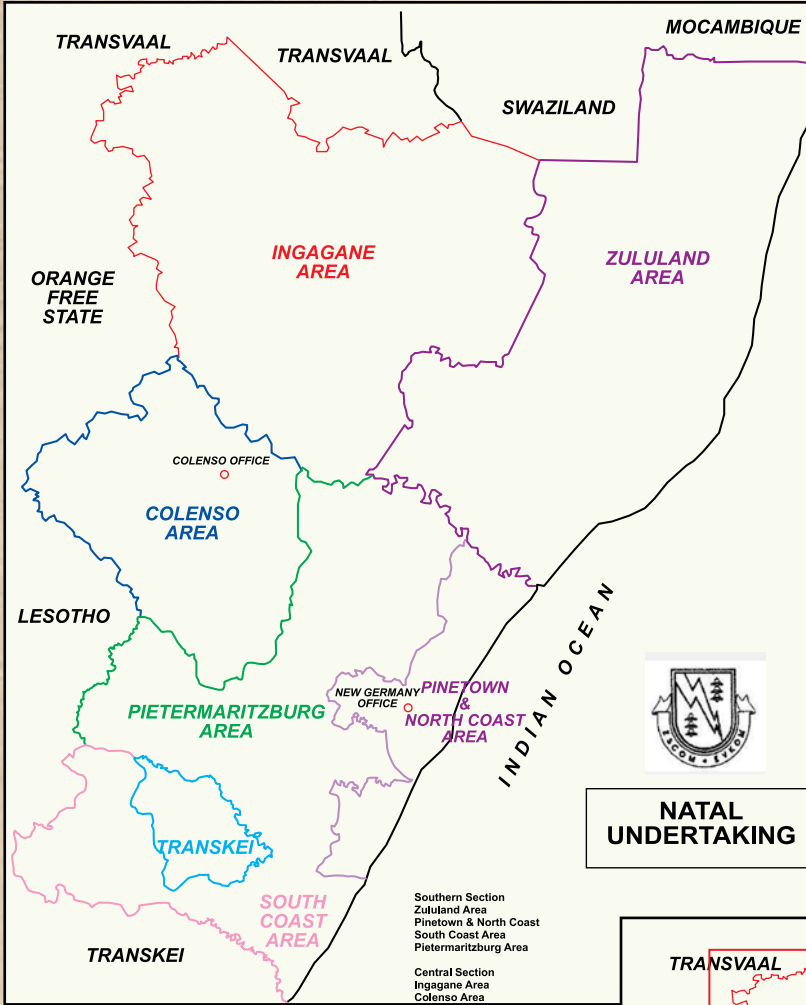
come what may, we power up your day.



Nokwethemba Mchunu

by Nokwethemba Mchunu

Annexure 1



Annexure 2

KZN OIL FIELD SUBSTATIONS PER FIELD SERVICE AREA

The region has a total of 431 substations.

Empangeni Field Service Area (89 Substations in total)	
HV	HV continued
Amatikulu 88kV Substation	Otuku 88kV Substation
Amatikulu 88kV Traction Substation	Pongola 132kV Substation
Benedict 88/22kV Substation	Pontus 132kV Substation
Candover 132kV Switching Station	Port Dumford 88kV Substation
Compensation 132kV Traction Substation	Port Dumford 88kV Traction Substation
Cwaka 88kV Traction Substation	Richards Bay North Traction Substation
Damall 132kV Traction Substation	Sappi 132kV Substation
Doornkop 132kV Substation	Shakasraal 132kV Substation
Driefontein 132kV Substation	Sifika 132kV Substation
Emekwesini 88kV Traction Substation	Stanger 132kV Substation
Empangeni 132kV Substation	Sundumbili 132kV Substation
Empangeni 88kV Oil Pump Substation	Tinley Manor 132kV Traction Substation
Empangeni 88kV Traction Substation	Ulundi 88kV Substation
Eqwasha 88kV Traction Substation	Ulundi 88kV Traction Substation
Eshowe 88kV Substation	Zinkwazi 132kV Linking Yard
Gingindlovu 88kV Substation	Zinkwazi 132kV Substation
Gledhow 132kV Traction Substation	Zircon 132kV Substation
Glendale 132kV Substation	
Hambaneni 132kV Traction Substation	MV
Huhluwe 132kV Substation	Avour 22/11kV Substation
Hudley 88kV Traction Substation	Babanango 22/11kV Substation
Intshamunzi 88kV Traction Substation	Buffalo Mobile Substation
Kambe 88kV Traction Substation	Damal 22/11kV Substation
Kwambonambi 132kV Substation	Dover 22/11kV Substation
Legun 132kV Substation	Estuary 22/11kV Substation
Madungela 132kV Substation	Fort Yolland 22kV Switching Station
Mahabatini 88kV Oil Pump Substation	Hillbrow 22/11kV Substation
Makhathini 132kV Substation	Huhluwe 474 22/11kV Substation
Mandawe 88kV Substation	Horseshoe 22/11kV Substation
Mandini 132kV Substation	Inyathi Road 22/11kV Substation
Mandini 132kV Traction Substation	Kemron 22/11kV Substation
Manguzi 33kV Substation	Kwambonambi Town 22/11kV Substation
Mhlatuze 88kV Substation	Kwamsane 22/11kV Substation
Mluze 132kV Substation	Melmoth 22/11kV Substation
Mpanda 88kV Traction Substation	Mhlatuze 1 22/11kV Substation
Mtonjaneni 88kV Substation	Mluze 1 22/11kV Substation
Mtsheluba 132kV Substation	Mluze Town 22/11kV Substation
Mtunzini 88kV Substation	Molekhoa School 22/11kV Substation
Ncwane 88kV Substation	Mtsheluba Township 22/11kV Substation
Ngoye 88kV Substation	Nkandla 22/11kV Substation
Ngwlezana 88kV Substation	Nyeleni 88/22kV Substation
Nkwaleni 88kV Substation	Phinda Forest 22/11kV Substation
Nondabuya 132kV Substation	Pongola Sugar Mill 22/11kV Substation
Nongoma 88kV Substation	Pongola TLC 22/11kV Substation
Nzeleni 132kV Substation	Riverview 22/11kV Substation
	Sothana 22/11kV Substation

Margate Field Service Area		(77 Substations in total)
HV	HV continued	
Bendigo 132kV Substation	Sezela 132kV Substation	
Bhekintaba 33/11kV Substation	South Port 88kV Traction Substation	
Bolton 88kV Traction Substation	Turion 88kV Traction Substation	
Cedarville 33kV Substation	Ubejane Mobile Substation	
Clanshal 88kV Substation	Umgababa 88kV Substation	
Claustal 88kV Switching Station	Umtombeni 88kV Substation	
Claustal 88kV Traction Substation	Umzinko 88kV Substation	
Franklin 33kV Substation	Uvongo 88kV Substation	
Harding South 88kV Substation	Wetherby 132kV Substation	
Hibberdene 88kV Substation	Widenham 88kV Substation	
Idwala 132/11kV Substation	Winkelspruit 88/33kV Substation	
Ingefi 88kV Substation	Winkelspruit 88kV Traction Substation	
Izotsha 88kV Substation		MV
Kelso 88kV Traction Substation	Bouneparles 22/11kV Substation	
Kingsdale 88kV Substation	Dududu 22/11kV Substation	
Kokstad 132kV Substation	Ellingham 22kV Switching Station	
Luleke 132kV Substation	Freeland Park 22kV Substation	
Maluri 132kV Substation	Golf Course 22/11kV Substation	
Margate 88kV Substation	Jahulani 22kV Substation	
Marina 88kV Substation	Magabeni 22kV Substation	
Mabatiela 33kV Substation	Manaba 11kV Switching Station	
Montreux 88kV Substation	Marburg 11kV Switching Station	
Mt Fletcher 33kV Substation	Marine Drive 11kV Switching Station	
Mt Frere 132kV Substation	Munster 22/11kV Substation	
Mwalume 88kV Substation	Palm Beach 22/11kV Substation	
Mzintlana 33kV Substation	Park Rynie 22/11kV Substation	
Nkonka 132kV Substation	Pennington 22kV Substation	
Nqabeni 132kV Substation	Pioneer Road 11kV Switching Station	
Oribi 132kV Substation	Qwabe 22/11kV Substation	
Paddock 88kV Substation	School Road 11kV Switching Station	
Plains 88/11kV Substation	Seapark 22/11kV Substation	
Port Edward 88kV Substation	Seaview 22/11kV Substation	
Port Shepstone 132kV Substation	Shelly Beach 11kV Switching Station	
Rams 33/22kV Substation	St Josephs 22kV Substation	
Ramesgate 88kV Substation	St Michaels 11kV Switching Station	
Rayon 132/11kV Substation	Temple Road 22/11kV Substation	
Redhill 88kV Substation	Umkomaas 22kV Substation	
Saieccar 132kV Substation	Uplands Road 11kV Switching Station	
Scottburgh 88/22kV Substation	Weza 22kV Substation	

Newcastle Field Service Area		(141 Substations in total)
HV	HV continued	
Alcockspruit 88kV Traction Substation	Mdwebu 33/11kV Substation	
Alpha 88kV Substation	Milnerdale 88kV Traction Substation	
Ballengeich 88kV Substation	Mqwebu 88kV Traction Substation	
Beechwick 88kV Traction Substation	Pam Mobile Substation	
Bergville 33kV Substation	Parllands 132kV Substation	
Bergvliet 88kV Substation	Paulpietersburg 88kV Substation	
Besters 88kV Substation	Pepworth 88kV Substation	
Besters 88kV Traction Substation	Pepworth 88kV Traction Substation	
Blaauwbosch 33kV Substation	Pentekop 88kV Substation	
Boschmans 88kV Substation	Pentekop 88kV Traction Substation	
Brakfontein 132kV Switching Station	Pieters 88kV Substation	
Brakwal 88kV Traction Substation	Pieters 88kV Traction Substation	
Buffelshoek 33kV Substation	Platberg 88kV Substation	

Cathkin 33kV Substation	Flatrand 88kV Substation
Caynguba 88kV Traction Substation	Flatrand 88kV Switching Station
Chieveley 88kV Traction Substation	Flatrand 88kV Traction Station
Clontarf 88kV Substation	Quagga 88kV Oil Pump Substation
Clontarf 88kV Traction Substation	Rielspruit 88kV Traction Substation
Colenso 132kV Substation	Riversmeert 33kV Substation
Colenso 88kV Traction Substation	Robroy 88/11kV Substation
Colenso Town 88kV Substation	Rosinaba 132kV Substation
Colworth 88kV Traction Substation	Rusthof 88kV Traction Substation
Commandale 88kV Substation	Ruston 88kV Substation
Coronation 33kV Substation	Rutland 33kV Substation
Craigside 88kV Switching Station	Sandspruit 88kV Traction Substation
Dabula 88kV Traction Substation	Sikame 88kV Traction Substation
Dagbreek 88kV Substation	Skume 88kV Traction Substation
Dannhauser 88kV Substation	Spioenkop 132kV Substation
Dannhauser 88kV Traction Substation	St James 88kV Substation
Darekraal 88kV Switching Station	Stafford 33kV Substation
Davel 88kV Substation	Stikwater 88kV Traction Substation
Dejagersdrif 88kV Traction Substation	Strathcona 88kV Traction Substation
Doringberg 88kV Traction Substation	Talana 88kV Traction Substation
Driel 132kV Substation	Taveta 88kV Substation
Duckspand 33kV Substation	Uithoek 88kV Traction Substation
Dumbe 88kV Traction Substation	Uitkoms 88kV Substation
Dundee 88kV Substation	Umbuwana 88kV Traction Substation
Ekuvukeni 88kV Substation	Utrecht 88kV Substation
Elandslaagte 88kV Traction Substation	Vaaltrans 88kV Substation
Elisabeth 33kV Substation	Vergenoeg 132kV Substation
Emmaus 33kV Substation	Vaklaagte 132kV Substation
Emondlo 88/22kV Substation	Volksrust 88kV Substation
Engqueni 88kV Traction Substation	Vooruitsig 88kV Traction Substation
Ennersdale 88kV Traction Substation	Vryheid 88kV Substation
Estcourt 132kV Substation	Vryheid 88kV Traction Substation
Ezakeni 132kV Substation	Walkershoek 88kV Traction Substation
Frere 88kV Traction Substation	Wasbank 88kV Traction Substation
Georgina 33kV Substation	Weenen 33kV Substation
Glencoe 88kV Substation	Wembesi 33/11kV Substation
Glencoe 88kV Traction Substation	Wesselsnek 88kV Traction Substation
Glenharle 88kV Traction Substation	Willowford 88kV Substation
Hatlingspruit 88kV Traction Substation	Wimerton 33kV Substation
Hlotwane 88kV Substation	Wilkopies 88kV Traction Substation
Hlungwana 88kV Traction Substation	Wykom 88kV Traction Substation
Hofffontein 88kV Traction Substation	Zaaifontein 88kV Substation
Inqayane 88kV Traction Substation	Zaaihoek 88kV Substation
Jagersrust 132kV Substation	MV
Keswick 33kV Substation	Alkemann 22/11kV Substation
Kilbarchan 88kV Substation	Amersfoort 22kV Switching Station
Kingsley 88kV Traction Substation	Eendvogel Vei 22/11kV Substation
Lands End 88kV Traction Substation	Ezanoluhle 22/11kV Substation
Langsnek 88kV Traction Substation	Klipspruit 88kV Substation
Letsand 88kV Substation	Memel 22/11kV Substation
Lentle 88kV Substation	Ngwenya Mobile 22kV Substation
Louresburg 33kV Substation	Nondweni 22kV Switching Station
Madadeni 88kV Substation	Rooiboom 22kV Substation
Mairs Camp 33kV Substation	Smaldeel 22/11kV Substation
Majuba 88kV Traction Substation	Twin Hills 22/11kV Substation
Malonjeni 88kV Traction Substation	Vants Drift 22kV Switching Station
Mandabeni 33kV Substation	Wesselsnek 22/11kV Substation
Mapaseni 88kV Traction Substation	White Mountain 22/11kV Substation

Pietermaritzburg Field Service Area

(124 Substations in total)

HV	HV continued
Abattoir 132kV Substation	Msunduzi 132kV Switching Station
Albert Falls 33/11kV Substation	Northdene 88kV Traction Substation
Appelsbosch 33/11kV Substation	Oaklands 88kV Substation
Ashburton 88kV Traction Substation	Pentrich 132kV Substation
Assagay 88kV Substation	Pentrich 88kV Traction Substation
Balgowan 88kV Traction Substation	Pietermaritzburg 88kV Traction Substation
Beacon Hill 88kV Traction Substation	Quail 88kV Traction Substation
Bonnie 132/33kV Substation	Rainbow Lakes 88kV Substation
Boughton 88kV Traction Substation	Reunion 88kV Switching Station
Bulwer 88kV Substation	Reunion 88kV Traction Substation
Cato Ridge 88kV Substation	Riverdale 132kV Substation
Cato Ridge 88kV Traction Substation	Rosetta 88kV Traction Substation
Cavendish 88kV Traction Substation	Seven Oaks 33/11kV Substation
Cedara 88/11kV Substation	Shallcross 88kV Traction Substation
Cedara 88kV Traction Substation	South Portal 88kV Traction Substation
Cliffdale 88kV Traction Substation	Swayimana 33/11kV Substation
Craigieburn 33/11kV Substation	Thornville 132/11kV Substation
Crossmoor 88kV Traction Substation	Umlaas 132kV Substation
Curry's Post 132kV Substation	Umlaas Road 88kV Traction Substation
Dalton 33/11kV Substation	Umlazi 88kV Traction Substation
Dassenhoek 88kV Traction Substation	Umlazi 132kV Substation
Delville Wood 88kV Traction Substation	Wartburg 33/11kV Substation
Edendale 132kV Substation	Wartburg New 33/11kV Substation
Elandskop 88kV Substation	MV
Elangeni 132kV Substation	Anderson Rd 11kV Switching Station
Estcourt 88kV Traction Substation	Azalea 11kV Switching Station
Eston 88kV Substation	Beaumont 22kV Substation
Ferralloys 132kV Substation	Berea 11kV Switching Station
Fleetwood 88kV Substation	Buckman Boulevard 11kV Switching Station
Georgedale 88kV Traction Substation	Crocodile Mobile 22kV Substation
Gowrie 132kV Substation	Dambuza 11kV Switching Station
Greytown 33/11kV Substation	Dano 11kV Switching Station
Gruneck 33/11kV Substation	Defence 22/11kV Substation
Hammarsdale 88kV Substation	Donnybrook 22/11kV Substation
Hammarsdale 88kV Traction Substation	Futura Footwear 22/11kV Substation
Hermannsburg 33/22kV Substation	Green Road 11kV Switching Station
Hidcote 88kV Traction Substation	Highflats 22kV Substation
Hospital 132kV Substation	Himeville 22/11kV Substation
Howick 88kV Oil Pump Substation Yard A	Indumiso 11kV Switching Station
Howick 88kV Oil Pump Substation Yard B	Kelly Road 11kV Switching Station
Howick 88kV Substation	Kranskop NB15 22kV Substation
Imbali 132kV Substation	Mandela 11kV Switching Station
Ixopo 132kV Substation	Myezane 11kV Switching Station
Joubertsvei 88kV Substation	Patterson Road 11kV Switching Station
Kamberg 88kV Substation	Pholela 22/11kV Substation
Karkloof 33kV Substation	Pungashe 22/11kV Substation
Kloof 88kV Traction Substation	Sinathingi 11kV Switching Station
Kranskop 132/22kV Substation	Stott Road 11kV Switching Station
Lamington 88kV Substation	Thathawe 11kV Switching Station
Lidgetton 88kV Substation	Thembela 11kV Switching Station
Lidgetton 88kV Traction Substation	Tugela Ferry 22/11kV Substation
Lions River 88kV Traction Substation	Umzimkulu 22kV Substation
Lowlands 88kV Traction Substation	Umzimkulu Town Substation 22/11kV
Marian Hill 88kV Traction Substation	Underberg 22/11kV Substation
Mearns 88kV Substation	Unit B B 11kV Switching Station
Midmar 88kV Substation	Unit N 11kV Switching Station
Mizpah 132/33kV Substation	Unit P 11kV Switching Station
Mooi River 88kV Substation	Unit Q 11kV Switching Station
Mooi River 88kV Traction Substation	Untunjambili Hospital 22/11kV Substation
Mpolweni 33/11kV Substation	Vulindlela 11/22kV Substation
Mpophomeni 88kV Substation	Wolseley 22/11kV Substation
Mpumalanga 132kV Substation	Zikali 11kV Switching Station
Msinga 132/22kV Substation	