



ESKOM'S HISTORY IN THE NORTHERN CAPE

It all changed with
the flick of a switch



This chapter has been compiled from a collection of sources of which original references were not indicated.

FOREWORD BY HUGH MCGIBBON, GENERAL MANAGER OF THE NORTHERN CAPE OPERATING UNIT (re-established as an operating unit in September 2011)



It is a privilege to serve as General Manager of the Northern Cape Operating Unit which has such a rich history. The previous heads of the Undertaking and Regions have all played their part in establishing a culture of expecting only the best from their staff. In the past the Northern Cape has regularly been the number one performing

unit in Eskom.

I have also had the pleasure of working with many of the characters from the past Northern Cape Management teams. At the risk of leaving some out, here are some anecdotes from these encounters. The dates indicate the years they were at the helm of electricity supply in the Northern Cape.

The two managers I never personally interacted with were Mr H J (Hennie) de Villiers (01 February 1950 – 19 May 1952), and Mr C R (Collin) Burton (19 May 1952 – 01 June 1971).

I joined Eskom in 1973.

Mr J L (Lood) Rothman (01 July 1971 – 31 December 1974) succeeded Collin as Manager Cape Northern Undertaking (CNU). I worked closely with Mr Rothman for many years in Megawatt Park and learnt many lessons from him. I would be seriously reprimanded by him if I went to lunch without my jacket on.

Mr J P (Pem) Rodger (01 January 1975 – 31 August 1986) was appointed as Regional Manager of the Northern Cape Region when Mr Lood Rothman moved to Head Office. I don't think Pem ever got lured to Megawatt Park. Under Pem's guidance the Northern Cape Electricity networks flourished as the railways and mines were supplied from the grid.

I recall making a presentation to the Management team based in the Trust Centre in the early 1980's regarding a project I was driving. Pem Rogers re-

calls that visit, and we could chat about it when I invited him for a visit to Eskom on my recent appointment in Kimberley in 2011. He told me some fascinating stories of his pioneering days in Eskom, like the purchase of Trust Centre in the space of a week or two when they feared they may be evicted as tenants. He also arranged to get a few Eskom aeroplanes based in Kimberley to cope with the long distances to the construction sites when the networks were first established. Pem is still very active in Kimberley.

Mr Sarel Cilliers (01 September 1986 – 31 July 1987) was appointed Regional Manager after Mr Rodger retired, with Mr Eddie Cahill as his assistant.

Mr Eddie Cahill (01 August 1987 – 31 May 1995) was appointed Regional Manager after Mr Cilliers moved back to Johannesburg, with Mr William de Villiers (from the Western Cape) as his assistant. Eddie was President of the Northern Cape Chamber of Commerce & Industry (NOCCI) Kimberley – a position I have now been elected to.

When the Bloemfontein Distributor was formed, Mr William de Villiers was appointed as Engineering Manager in Bloemfontein and Mr Eddie Cahill as Customer Services Manager in the Northern Cape until his retirement. William de Villiers has recently retired from Eskom.

Eddie Cahill and I worked together to develop the Customer Service Rating tool, MaxiCare, in the 1990's. It is still in use today.

Mr Mongesi Ntsokolo (01 June 1995 – 30 June 1996) was appointed as Customer Services Manager in the Northern Cape after Mr Cahill retired. Mongesi was my manager when I was first appointed as a General Manager in 2007.

Mr M K (Kenneth) Mohlala (01 October 1997 – 31 June 2001) was appointed the Customer Services Manager in the Northern Cape after Mr Ntsokolo was transferred to Head Office. MK Mohlala was a real character who had a style of his own. He went on to head up City Power in Johannesburg.

For almost two decades the Northern Cape Province was then split across the various Distributors and Regions. Most recently the North Western Region, Central Region and Western Region managed parts of the territory. As such the "Eskom Northern Cape" lost its identity for a while and at times even slipped off the Eskom radar.

In September 2011 Eskom decided to structure along the provincial boundaries, and the Northern Cape Operating Unit was formed. Many of the staff who served under the old Northern Cape structure never lost their identity and are again today, along with myself, proud members of this vast Eskom Northern Cape Operating Unit.

INTRODUCTION

No South African history book is complete if Kimberley's name isn't mentioned in it. Its mere location on the country's map must have been a prediction that this city was destined for greatness. Situated in the heartland of South Africa, Kimberley is a town of firsts that led the way for other towns to follow.

But Kimberley wouldn't have been able to reach its status as a pioneering city if it wasn't for the wonder of electricity. This formed an integral part of Kimberley's history and today Eskom continues to contribute to the social and economic development of the Northern Cape Province.

As Brian Roberts put it in his book "Kimberley, the Turbulent City": "This is the story of South Africa's most extraordinary city. From the days before the discovery of diamonds, to the present time, the turbulent history of Kimberley is traced in fascinating detail." The same can be said for Eskom, a company which also has a turbulent history that can be traced in fascinating detail.

Here follows the story of how the history of two of South Africa's legends, merged to form one future.



Images of Kimberley in its early days



THE EARLY DAYS: FROM DUST TO DIAMONDS

In the beginning, there was light – small splashes of light amidst an otherwise dark South Africa. People from neighbouring areas flocked to Kimberley to see what they considered magic and a magnificent display of light. The date was 2 September 1882. For the past 11 years, since the discovery of a diamond on a desolate koppie, diamond diggers have been rushing to Kimberley to peg out claims. Their eagerness to start digging outweighed their need for proper living conditions leading to Kimberley becoming an outsized camp.

1882 was a mere three years since Thomas Alva Edison made a breakthrough by burning an electric bulb for 48 hours. Electricity was relatively expensive making it more economically viable for towns and cities to wait until the price of electricity became more competitive. However, the first flame arc lamps using direct current supply were illuminating streets and harbours of certain American towns. As diamond miners worked the fields of the Northern Cape by day and by night visited the 128 pubs that were opened in Kimberley in its first years, the need arose for similar lighting to be used in the streets of Kimberley. Although Kimberley was a rapidly developing city, it was still a “diggers’ camp” – dusty, dirty, overpopulated, primitive, crime ridden and unhealthy. Criticism was mainly directed at the town council and it was widely recognised that electricity is not a luxury but a necessity if Kimberley wants to develop further. 32 of these arc lights were ordered by the enterprising Borough Council and a power station named Lighting Station was built to support its use, leading to the City of Diamonds now also

glittering by night. The discovery of diamonds and now also the use of electricity, gave Kimberley the status of a pioneering city.

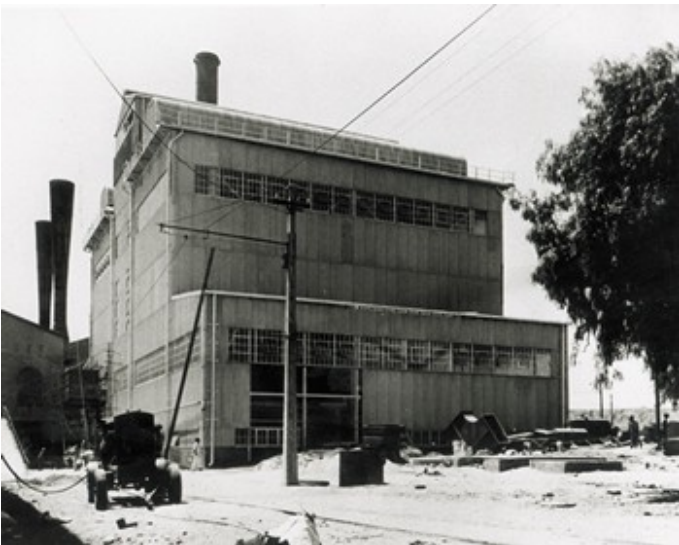
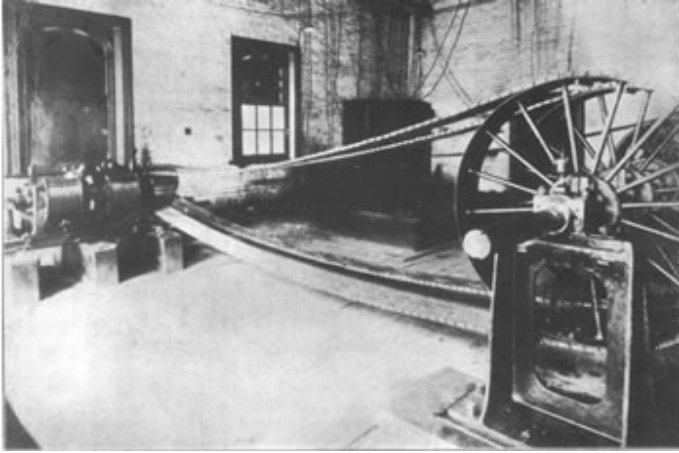
Although Kimberley was the first town south of the Equator that had electrical street lights installed and even used this technology before London that at that stage was still using gas lamps, the non-availability of coal, oil, water-power and cheap fuel had a retarding effect on the electrical development of Northern Cape towns, districts and industries.

In 1898 the Council built their second power station, again called Lighting Station, in Stockdale Street. This followed the invention of incandescent lights, meters, switches and standard lamp holders. Shops and residences were supplied by a D.C. system, 3-wire, 220/440 Volts. Due to capital charges on station plant and mains network, the cost of elaborate meters, the small number of consumers and the high cost of coal, the cost per unit was very high. In 1900 the electrical system was expanded to supply to the first domestic and industrial consumers.

An era of “Dual Control” began in 1903 when De Beers Company established its own power station. An electric tramline was opened in 1905 to Alexanderfontein. De Beers offered to supply electricity to the whole town of Kimberley and Beaconsfield from three company-owned substations at 220 volts A.C. Fierce discussions on A.C. and D.C. supply as well as the cost of electricity followed in the press. A public meeting decided in favour of taking supply from the mines, leading to the Council’s power plant being sold. Only two clerks were retained as liaison officers.



The De Beers Power Station was the first steam-turbine station south of the Equator. There were two Westinghouse generating sets of 1 000 kW each. These generated at 5 000 volts, 50 cycles. The increasing power demands on the mines caused De Beers to increase their generating capacity to 13 MW. During the first 24 years of the Dual Control, municipal load did not grow much.



Meanwhile in 1922, the Electricity Act, No 42 of 1922, bought the Electricity Supply Commission, Escom, into being. This act stated that the Com-

mission should supply a cheap, sufficient quantity of electricity neither at a loss nor a profit.

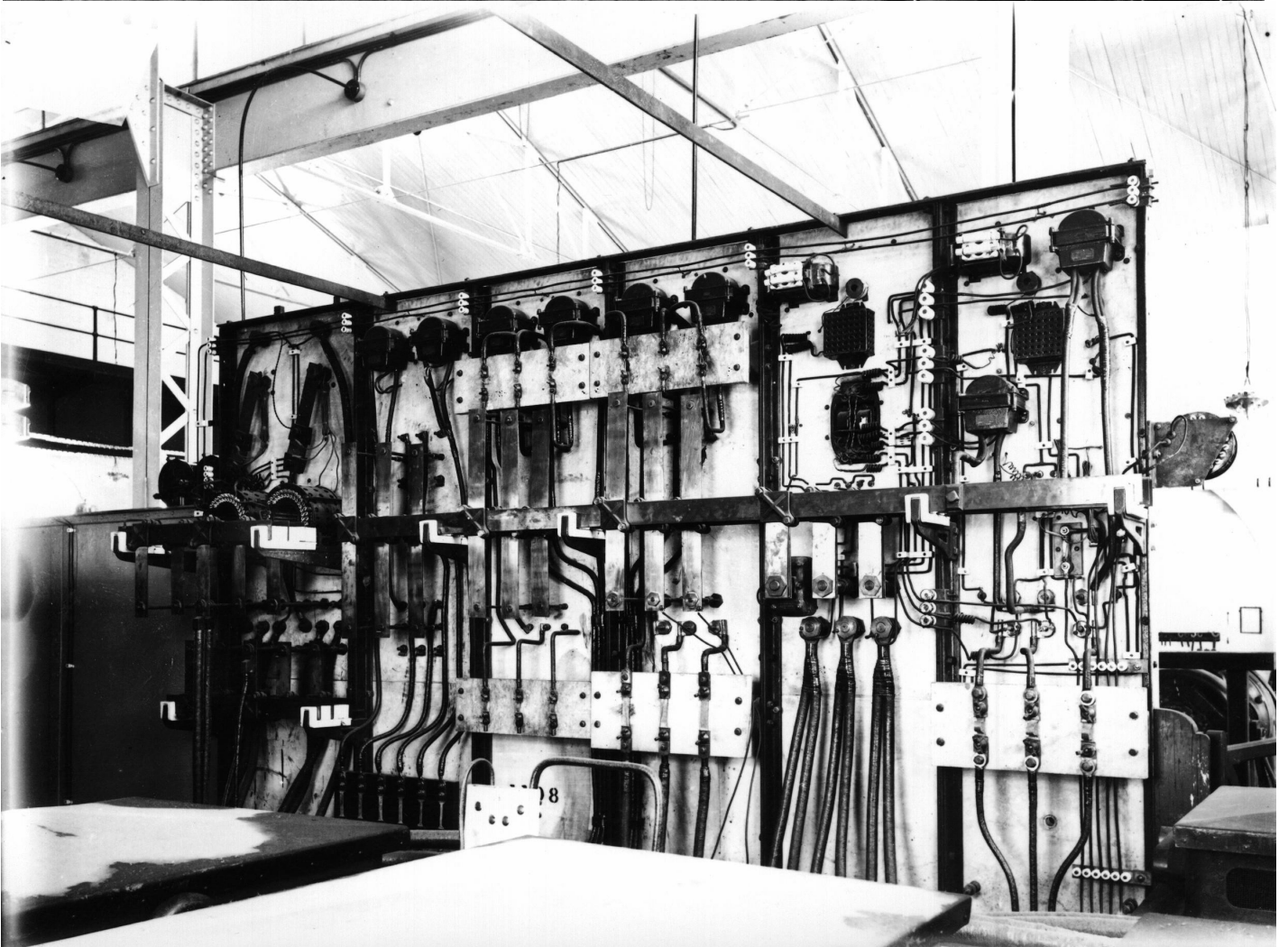
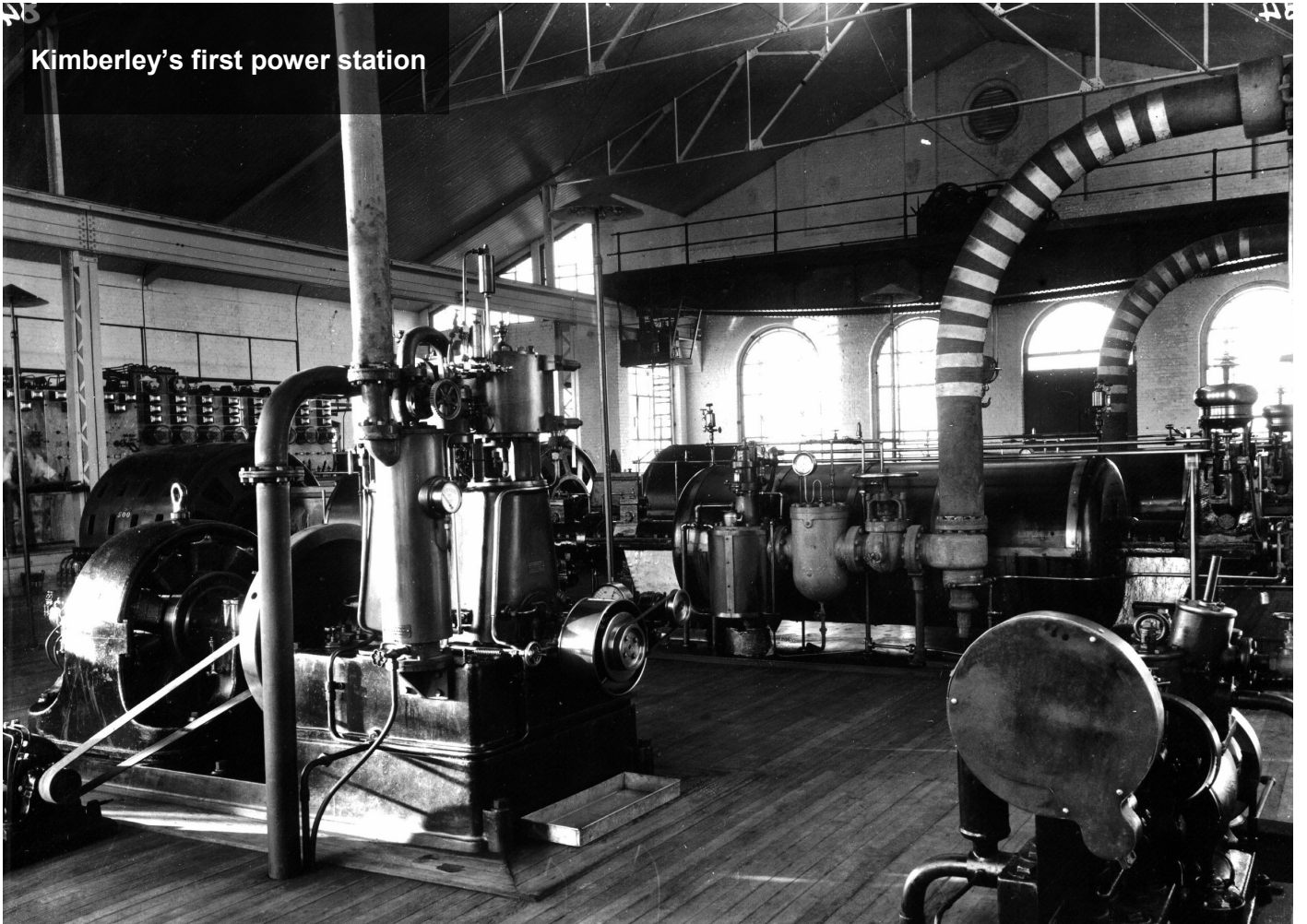
In 1927 the Council started to foster the idea of making more money if electrical appliances would be used more widely. At that stage, Kimberley had only one electrical stove, no domestic refrigerators and the streets in West End were still lighted by pressure paraffin lamps. A one-week exhibition of electric appliances was held in the City Hall and hence the demand for electricity grew. The Council sanctioned the building of several new substations and in 1936 two Council members proceeded to Escom House in Johannesburg - the highest building in the country at that stage - to submit proposals to Dr van der Bijl, first chairman of the Energy Supply Commission (Escom), for power lines along the Vaal and Modder Rivers where municipalities were using oil-engines, suction-gas engines and steam-engines. Dr van der Bijl was interested and directed his assistant to survey the possible electrical demand along the rivers and some adjacent towns. Sadly, it died a silent death. The report was not made public and Council heard no more about it.

In 1941, the Council gave De Beers one year's notice of the City's intent to terminate the dual-control contract and to take over the electrical responsibility for the municipal area and beyond. The Mines continued to provide the bulk supply for the City for the next eight years.

Since there was no coal available in the region the idea of obtaining electrical power from a distant locality was born. The proposals were sent to Escom House and within a few years a power station was built at Vierfontein where large deposits of low-grade coal were available. It was proposed that a power line be extended to Kimberley but this was never realised. In 1944 Riverton Pumping Plant was built and was the first municipal venture beyond its boundaries. A 27 km long 33 kV power line was erected and led to great electrical advances in Kimberley.



Kimberley's first power station



ESCOM IN THE NORTHERN CAPE IS BORN

In 1946 Anglo Alpha Company decided to build the first cement factory in the Northern Cape at Ulco. De Beers Company recognised the implications hereof and was prepared to hand over its power station at Kimberley to Escom at book value for the supply of electricity in the area. Escom's Dr Hendrik van der Bijl held discussions with the Anglo American Corporation, the Kimberley City Council and the Vaal River Electrification board in February 1947 and it was decided to establish the Cape Northern Undertaking (CNU) in 1950. Due to unavoidable delays, Anglo Alpha Company started supplying its own needs with a second-hand steam generating plant. Escom however still took over the De Beers Central Power Station and put plans in motion to increase the installed capacity from 20 MW to 30 MW. In this same year Mr H J (Hennie) de Villiers was transferred to Kimberley from Head Office to lead the Undertaking that covered 144 800 km² of the country's driest land. Office accommodation was obtained in Doherty's Building, one of the oldest buildings in Kimberley. This set in motion the plans for distribution of electricity throughout the vast Northern Cape area.

In its first year, the Undertaking's main focus was the operation of the power station and the supply to Kimberley's Municipality and De Beers Company. In 1954 capital became available and Eskom embarked on a favourable period of growth. The next year, supply was available in Boshof and Barkly West while expansions to the networks to Ulco and Vaalharts were underway. The CNU's first 66 kV line was put into use in late 1956. A meaningful milestone was reached in 1958 when the number of units sold to Kimberley was less than half of the total sales after outside areas were switched on. Soon the municipalities of Warrenton and Christiana as well as the townships of An-

dalusia, Hartswater and Pokwani were switched on and also irrigation farmers and mines in the asbestos, gypsum, lime and diamond fields. In 1958 the first interconnecting line from the Rand Undertaking was put through.



ESCOM IN THE NORTHERN CAPE FLOURISHES

Escom in the Northern Cape entered into an era of rapid growth. By the late sixties, 27 mines were connected as well as an SABC VHF station at Olifantskop, the Gamagara pumping scheme and the River Farmers' Scheme on the Riet and Modder rivers. This scheme was completed in 1970 and in the following year, the Douglas area was so active that the existing network had to be expanded. The Northern Cape was also the first region to see the advantages of operating their own aircraft. In 1969 they started using a plane to carry both personnel and equipment seeing that the west coast can be reached in two hours by plane, compared to ten hours by car.

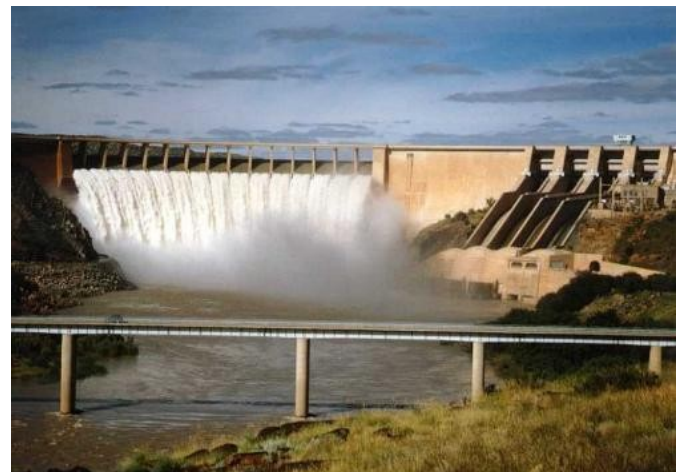
When Kimberley celebrated its centenary in 1971, the Cape Northern Undertaking turned 21. In the first 21 years of its existence, the number of consumers rose from four to 3 206 while the number of units sold rose from 54 million to 715 million. After 21 years, the total length of above the ground power lines stood at 4 000 km. The Railway Administration was the single biggest user, representing 25% of electricity usage with Kimberley's share totalling 18%.

While Escom celebrated its 50 years of existence in 1973, staff numbers in the Cape Northern Undertaking grew to such an extent that the initial three offices that hosted them were replaced by three buildings that could hardly contain them. In that same year staff moved to Escom's new offices, Trust Centre, with a panoramic view of the Northern Cape.

To the west a demand of 30 MVA was made by the Prieska Copper Company leading to Gordonia and Keimoes being the next to fall under Escom's power. Three salt works plus several domestic consumers at Salt Lake were connected and farmers' schemes to the east and west of Perdeberg were completed. Substations at Aggeneis, Nama, Gromis and Oranjemund were completed and the now well-known Sishen/Saldanha railway line was electrified.



Despite the Northern Cape being known for its dry conditions, it houses the country's second largest inland water reservoir, namely the Vanderkloof Dam near Petrusville. This dam has a capacity of 3 171 million cubic meters and has the highest dam wall in the country at 108 m with a crest length of 765 m. When the dam is full, it stretches over a distance of 100 km. In 1977 this water resource was put to great use when the Vanderkloof Hydroelectric Power Station was put into commercial service. The power station comprises two units generating 120 MW each and is an integral component of the Orange River Scheme. The two turbo generators are housed in a 91.2 m long, 24 m wide and 48.6 m high underground cavern below the dam wall on the left bank of the river. Today the station's electricity feeds into the Eskom National Grid to supply power for peak and emergency demand periods, as well as base load when excess water might pose a flood risk.



VANDERKLOOF (240 MW)



Oil price increases led to Escom not needing to canvass for consumers since consumers have been approaching Escom to be connected. Escom in the Northern Cape boasted with a growth of 15.07 per cent per annum, totalling a thirty-three-fold growth over the first 25 years. During 1980, a record 759 consumers were connected,

involving one bulk supply and five mines. Nearly half of these fell under the Upington district, an arid and rugged area stretching from Boegoeberg Dam to Seekoeistreek below the Augrabies falls. The staff of 26 at the Upington Depot had to cover this vast area of some 350 km with the help of only one depot in Kakamas which was manned by an electrician and six assistants. Plans were underway to build a depot in Groblershoop.



Roughly 300 km south east of Upington lies Douglas. At the Douglas Depot, a staff of 29 served 553 customers in the area that extended from Ulco to Prieska and Hopetown to Griquatown. They mostly served farmers but also supplied the municipalities of Douglas, Griquatown and Hopetown.

Big changes came about in the mid to late 80's one of which was the change from the name Eskom to "Eskom". In 1986 the Cape Northern Undertaking experienced a name change and became the Northern Cape Region. In order for Eskom to improve its service to customers, it restructured in 1993 leading to the Northern Cape Region being amalgamated with the Free State Region, forming the Bloemfontein Distributor. But that was far from the last change. In 1997 Eskom restructured again and the Northern Cape was split between the Western Region with its head office in Cape Town, the Central Region with its head office in Johannesburg and the North Western Region with its head office in Bloemfontein.



PRESENT DAYS: THE SUCCESS STORY CONTINUES

In 2011 another milestone for Eskom in the Northern Cape was reached when Eskom's next restructuring process entailed that the six Regions were split into nine Operating Units following the provincial borders leading to Eskom in the Northern Cape breaking its ties with the former Western, Central and North Western Regions. On 1 September 2011, Hugh McGibbon was appointed as the General Manager of the newly established Northern Cape Operating Unit (NCOU). The Operating Unit's head office remained in Trust Centre, Kimberley.

Today, electricity demand of 725 MW in the Northern Cape equals approximately 2% of the national demand of 36 970 MW. 222 substations in the Province are connected by 39 582 km of line. The initial four customers have now grown to 35 852 of which 81.53% are residential, 0.06 are municipal and 18.02% are industrial, mining, commercial and agricultural customers. Customers across the Province are serviced by staff in 15 Customer Network Centres. Since inception, 67 601 electrical connections have been made in the Northern Cape.



Common challenges that the NCOU is faced with include floods leading to power outages, animal contacts with power lines, lightning, long distance of power lines, acquisition of land rights and traveling time due to the vastness of the Province. The boom of mining activities in the Kathu, Kuruman and Kalahari areas requires more electrical capacity to be installed. The new railway from Sishen to Saldanha scheduled to be completed in 2012 will drastically increase economic activity for the Northern Cape but is also constraint by the electrical capacity in that area.

Images of the picturesque Northern Cape



THE FACE OF THE FUTURE

In the coming years, the face of electricity in the Northern Cape will change considerably. Due to all-year sunshine, the Northern Cape has been earmarked for a solar corridor which is expected to produce 5 GW by 2020 at rates competitive to that of coal. The electricity generated will be fed into Eskom's National Grid. The Northern Cape was identified as the best location for such a project, due to its consistent solar radiation, flat and sparsely populated land, good transport and electricity grid infrastructure and the Orange River as a reliable water source. The proposed 'Northern Cape Solar Corridor' includes sites near Upington, Groblershoop, Prieska and De Aar. Farm 451 Klipkraal, located close to Upington, was identified as the preferred site for a 1 GW solar park as Phase 1 of the Solar Park Programme supported by Eskom's plan to evacuate up to 1 500 MW by early 2017. This project will lead to the creation of around 12 000 annual direct construction jobs, up to 3 000 annual operation and maintenance jobs and around 461 000 economy-wide indirect jobs.



Another highlight for the Northern Cape is one in which Eskom has a major role to play. The SKA (Square Kilometre Array) Program is collaboration between institutions in 20 countries.

On 25 May 2012 the Members of the SKA Organisation announced that the SKA telescope would be split over Africa and Australia, with a majority share of the telescope destined to be built in South Africa. The main beneficiary province of this great initiative will be the Northern Cape in the Karoo area which is a radio quiet area with sparse population and no economic activity other than low density farming. It is also a dry, high plateau providing good atmospheric and tropospheric conditions for mid-frequency observations. Although it is remote, it is well serviced with basic infrastructure such as utility grid power and roads.



The new 33 kV power line constructed between the Karoo sub-station and the MeerKAT site was switched on for the first time at the end of September 2010, to allow for testing and commissioning of the line from the substation to the Klerefontein support base, the MeerKAT site complex at Losberg and the KAT-7 radio telescope. The KAT-7 telescope is now powered by the new grid power line, which is currently being operated at 22 kV. This will be switched over to 33 kV once the upgrade to the Karoo sub-station has been completed in March 2013. Back-up power is also provided to the radio telescope and buildings on site and at Klerefontein.

This proved to be another great contribution to the rich history of the Northern Cape, making it yet again another first for the Southern Hemisphere.

OUR VISION: THROUGH THE EYES OF THE GM, HUGH McGIBBON

After years of planning, the Northern Cape Operating unit is starting to take shape. It will pick up from our rich heritage described in this publication. It is really exciting!

There are physical and systems challenges. We need to establish two Zone Offices, in Kimberley and Upington, as well as additional Specialised Service Units and Customer Network Centre facilities. As we are currently serviced from three Control Centres and Work Management Centres, we need to migrate this to one centre. This will take time as many physical reconnections need to be done.

All of these changes must happen with Zero Harm and zero disruption in the service we provide. Our performance is good and we have an excellent opportunity of improving it to world class standards.

The most exciting aspect of our business is growth! Over the coming months and years we will see lots more economic activity in the Northern Cape. Apart from the new mines, with the associated Transnet and general business capacity increase, we will see many renewable Independent Power Stations being constructed all over the Province. These will produce more power during the daylight hours than the current usage in the

Province! The Northern Cape is destined to be a net exporter of electricity.

To evacuation of the net surplus of power, new transmission and distribution infrastructure is being built. To cater for the new skills we will need, we are establishing a full-fledged training simulator in Kimberley which will consist of class rooms, workshops, an operational live substation as well as live and dead lines with representative customer points.

In addition to me as General Manager, two more Senior Managers are already appointed. Our Operations and Maintenance Manager, Motlhabane Ramashi, started on 1 March 2012 and our Asset creation Manager, Nancy Maluleke, on 1 April 2012. We have appointed eight managers already reporting to the senior managers and they are busy rolling out their structures.

The Northern Cape is going to be a focus growth point in South Africa and Eskom must rise to the challenge of providing sustainable electricity solutions to grow the economy and improve the quality of life of people in the Northern Cape.

We have excellent examples in our past history to equip us to deal with this challenging future, which is healthy and growing. We have dedicated staff in the Northern Cape and I am confident they will uphold our rich heritage!

