

# Electricity Supply Commission.

Electricity House,  
82, Marshall Street,

Johannesburg,

30th June, 1925.

To the Honourable

The Minister of Mines and Industries,  
Capetown.

SIR,

In conformity with the provisions of Section 14 of the Electricity Act, 1922, the Commission has the honour to submit its second annual report—for the year ended 31st December, 1924,—together with a brief review of its activities up to the date of this report.

The work of the Commission during the year under review again consisted mainly of preliminary work, negotiation of contracts, etc., in connection with the several undertakings which it is establishing and which are more fully referred to elsewhere in this report, and of investigations into municipal and other electricity schemes in various parts of the Union. The work in hand has involved negotiations with manufacturers for plant and equipment, with contractors for the various works connected with the power stations, such as water-works, foundations, buildings, etc., with those from whom land and other rights and facilities are required, and with prospective consumers.

One of the duties imposed upon the Commission under the Electricity Act is to secure where practicable the co-ordination and co-operation of electricity undertakings so as to stimulate the provision of a cheap and abundant supply of electricity.

General.

Co-ordination of Electricity Supplies.

Power stations and reticulation systems, representing both municipal and private enterprise, already exist in most of the larger centres in the Union.

For the most part, therefore, the problem before the Commission is not that of starting, *ab initio*, to develop new areas not already provided with power, on the basis of present-day knowledge and technical practice, but of determining and, if possible, securing the best means of supplementing and adapting existing sources of supply to meet the growing needs of the various communities.

Having regard to the short time the Commission has been in being and the limited scope for co-ordination work in South Africa owing to the distance dividing main centres of production and supply, the efforts of the Commission in this direction have met with signal success.

Mention is made elsewhere in this report of the agreements entered into by the Commission with The Victoria Falls and Transvaal Power Company, Limited, the Corporation of the City of Capetown, and the Corporation of the Borough of Durban. These agreements provide, *inter alia*, for the linking up of the new undertakings to be established by the Commission with existing power stations and distribution systems, thus affording added security of supply and at the same time effecting considerable savings in stand-by plant.

Arrangements have been made with the Capetown and Durban Municipalities whereby any extensions required to cope with increased demands upon the Capetown and Durban undertakings will take place at the generating stations in Capetown and Durban in which power can be most economically produced.

Misconception still appears to exist in the minds of many people as to the constitution and functions of the Electricity Supply Commission and its relationship to the Government and to the Electricity Control Board.

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Misconception still appears to exist in the minds of many people as to the constitution and functions of the Electricity Supply Commission and its relationship to the Government and to the Electricity Control Board.

The Electricity Act, 1922, was the outcome of a general recognition that cheap electric power is a factor of vital importance in industrial development, and that it was necessary to introduce legislation which would provide, not only for the control and guidance of the power supply industry along lines that experience in South Africa and abroad had indicated to be desirable, but also for the setting up of machinery which would be suitable to foster and encourage the development of cheap power in South Africa.

This was a recognition that was shared by all who had the interests of South Africa at heart, as experience in the United States of America had indicated that the availability and widespread use of electric power were responsible in large measure for the rapid industrial development of that country and for the high standard of living of its labouring classes.

The question of the ownership of public utilities has been considered from time to time almost all over the world. For some years the matter was very actively discussed in the United States of America, but no new developments then eventuated. The subject is a controversial one and opinions differ widely as to the solution likely to produce the best results.

Protagonists of public and private ownership frequently pit the one against the other without adequate recognition of the fact that each form of control has its merits and that the merits of a system vary in different countries according to conditions, and without investigating and considering the possibilities of alternative methods combining the advantages of both systems while guarding against their respective disabilities.

The South African Electricity Act, without closing the door to private enterprise, aims at combining the advantages of public ownership and private enterprise by the establishment of an Electricity Supply Commission, which represents no particular group of persons or interests, which



receives financial support from the Government, and which is required by law to distribute amongst its consumers in the shape of reduced prices any profits remaining after meeting interest and redemption charges and setting aside a contribution, limited by statute, to a reserve fund for betterment and other specified purposes. What the Electricity Supply Commission has in common with private enterprise is that it operates strictly on business lines, is outside political control, and, like any other power undertaking, is licensed and controlled by the Electricity Control Board.

Whilst overseas last year taking part in the World Power Conference held in London, the Chairman of the Commission discussed the question of the ownership and control of public utilities and allied power problems individually with over two hundred and forty power executives and engineers from almost all parts of the civilised world, and, although some of them are strong advocates of private enterprise, the opinion generally expressed was that South Africa deserves great credit for its progressive legislation in this respect and the steps it has taken in an endeavour to solve, along modern and advanced lines of thought, the difficult problem of properly safeguarding the national interest in the power supply business.

Broadly the functions of the Commission are :—

- (1) to establish, acquire, maintain and work undertakings for an efficient supply of electricity;
- (2) to investigate new or additional facilities for the supply of electricity and the co-ordination and co-operation of existing undertakings so as to stimulate the provision of a cheap and abundant supply of electricity; and
- (3) to advise the Administrators of the several Provinces upon new municipal schemes or extensions to existing municipal schemes.

In regard to (3) the Commission's functions are purely advisory.

The Commission's principal function is to produce and provide a cheap and efficient supply of electricity where required. Before it can establish or acquire an undertaking for this purpose it must first obtain the approval of the Minister of Mines and Industries and the requisite authority from the Electricity Control Board in the form of a permit or licence.

Under the Electricity Act the controlling authority in electricity production and supply is the Electricity Control Board. The Commission exercises no control over other power undertakings, having itself been created to undertake the generation and supply of electricity. The Commission is licensed and controlled by the Electricity Control Board in exactly the same way as a private concern, the Control Board being the licensing authority and the authority which represents the Government and ensures compliance by all undertakings with the general policy embodied in the Electricity Act.

The Chairman and the Assistant Secretary of the Commission attended the World Power Conference held in London in June, 1924. Thirty-nine countries were represented at this Conference at which much valuable information was disseminated. At the conclusion of the Conference it was agreed that World Power Conferences should be continued and be held at intervals of three to five years. In view of the proposal to establish these Conferences on a permanent footing, it is desirable that a permanent National Committee for South Africa should be formed, and a recommendation to this effect will shortly be submitted to you by the National Committee appointed by permission of the Government in connection with the 1924 Conference.

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sion has taken place recently in engineering circles. The general conclusions arrived at are that the best results, technical and financial, are obtainable by linking together large power stations so that a given area is supplied, not from a number of independent plants, but from an inter-linked system comprising several large and efficient stations. The consensus of opinion amongst leading power engineers is that in no other way can the greatest economies in production and supply be realised.

In 1923 a Committee was set up in New York State to study the problem of economic power supply as between power companies operating in that area. Their findings were that, provided proper inter-connection was adopted, 60,000 K.W. of stand-by plant could be released and \$1,750,000 more earned by existing plant in 1923, and a saving in installed capacity of 237,000 K.W. effected by 1933, the latter representing a plant investment of \$37,125,000.

Amendment  
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Act, 1922.

An Act, entitled the Electricity Act Amendment Act, 1924, was placed on the Statute Book during the first session of the present Parliament, providing for the amendment of Section 6 of the Electricity Act, 1922.

The amendment enacted, whilst removing the unnecessarily cumbersome and undesirable features of Section 6 of the principal Act, retains intact the principles which that section was intended to safeguard.

Under Section 6 of the principal Act the Commission was required, irrespective of conditions as to urgency or as to the views of the parties most concerned, to call for tenders for the taking over and/or working of an undertaking before itself establishing such an undertaking. It was also required to call for tenders for the taking over and/or working of an undertaking, after the undertaking had been in operation by the Commission for five years.

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The necessity for automatically calling for tenders prior to the establishment of an undertaking led to considerable delay and expense in dealing with the first two undertakings with which the Commission was concerned. In both instances, the principal consumers had already entered into provisional agreements with the Commission. No tenders were received, but even if tenders had been received no tender would have been acceptable to the principal consumers. Adequate safeguards are provided for elsewhere in the Electricity Act, inasmuch as the Commission, before establishing an undertaking, must have the approval of the Minister and obtain a licence or permit from the Electricity Control Board. If the Minister is not satisfied with the Commission's proposals the Government can veto the scheme. Moreover, the Commission's application for a licence has to be advertised and any interests likely to be prejudiced have an opportunity of lodging an objection with and of being heard by the Electricity Control Board when the Commission's application comes before the Board for consideration.

The provision for automatic tendering after five years' operation was also cumbersome and open to objection. Although consumers might be satisfied that the undertaking was being efficiently operated, the Commission was required to go to the expense of preparing specifications and calling for tenders for handing over the ownership and/or working of the undertaking. Prospective consumers objected to this clause on the ground that if they entered into an agreement with the Commission someone else might be in charge of the undertaking in five years' time.

Under the amending Act, No. 34 of 1924, automatic invitation to tender prior to establishment has been dispensed with and the provision for automatic tendering at the end of five years has been substituted by a provision to the effect that, if at any time after five years from the date of commencement of

supply by the Commission, representations are made to the Minister by consumers to the extent of not less than two-thirds of the output of the undertaking that the undertaking might be more advantageously acquired or worked or both acquired and worked by another undertaker, the Commission shall invite tenders for the acquisition or working or the acquisition and working of the undertaking.

Under Clause 6 of the principal Act, any tenders received had to be reported upon by the Commission. The matter had thereupon to be referred by the Minister to the Electricity Control Board and the South African Railways and Harbours Administration, if the Administration was a consumer of the undertaking. In the amended clause, provision has been made that the matter must also be referred to any local authority which takes on an average not less than thirty million units per annum from the undertaking.

Sub-section 6 of Section 6 of the principal Act provided that any agreement entered into with the tenderer for the taking over of any of the Commission's undertakings should contain adequate provision for safeguarding the Commission's loans. The amending Act stipulates that adequate provision shall also be made in the agreement for safeguarding the interests of consumers.

The Commission is proceeding with the establishment of the following undertakings, and with the construction of the power stations, transmission and distribution systems and other equipment in connection therewith:—

Undertak-  
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Name of Undertaking.	Date of Licence or Permit.	Installed Capacity in Kilovolt Amperes.
Witbank ...	Licence granted 6th April, 1925 ... ..	70,500
Colenso ...	Permit for supplies by Commission granted 26th June, 1925 ...	66,600
Capetown ...	Licence granted 6th April, 1925 ... ..	33,300
Durban ...	... ..	30,000
Sabie ...	Permit granted 5th June, 1925 ... ..	2,200
	TOTAL ... ..	<u>202,600</u>

The Colenso undertaking has been included in this statement for the reasons (a) that although the works are being constructed by the Railway Administration, it is proposed that the power station, transmission lines and sub-stations shall be taken over by the Commission as soon as the railway electrification scheme has been completed and placed in commercial operation, and (b) that a supply of electricity to consumers along the electrified section of the Natal Main Line will shortly be given by the Commission from the Colenso undertaking.

#### WITBANK UNDERTAKING.

In the Commission's First Annual Report, dated 9th August, 1924, mention was made of the negotiations, which had been proceeding in regard to the establishment of an undertaking at Witbank, and of the agreement, dated 5th July, 1924, entered into between the Commission and The Victoria Falls and Transvaal Power Company, Limited. A more comprehensive review of these negotiations, of the Commission's position in the matter, and of the

agreement itself was given in the Commission's Report to you dated 30th August, 1924, upon the Witbank undertaking.

Agreement  
with  
Victoria  
Falls  
Company.

In the circumstances, it is unnecessary to review the earlier negotiations leading up to the arrangement arrived at that the Witbank Generating Station be constructed by the Victoria Falls Company at cost price for and on behalf of and in collaboration with the Commission.

All land, servitudes and other rights acquired in connection with the Witbank Generating Station are registered in the Commission's name. All contracts and all expenditure are subject to approval by the Commission, and the allowances to be made for interest, engineering fees, administration and other such charges, are laid down in the agreement.

As has been explained in previous reports, the reasons for permitting the Victoria Falls Company to proceed with the erection of the Witbank Generating Station on the Commission's behalf were:—

- (a) that the Company was in a position to commence work forthwith, having completed preliminaries before applying to the Control Board for authority to itself erect the station. Plans and specifications had been drawn up and, anticipating the approval of the Electricity Control Board, some contracts had been placed provisionally;
- (b) that the gold mining industry was urgently in need of additional power, and that for the Commission to have insisted upon building the generating station would have involved delay and restriction of mining development, as the Commission could not have commenced work until it had completed its preliminaries and obtained its licence. Construction work is now well advanced,

although the Commission only obtained its licence on 6th April, 1925. As the mines and other consumers of the Victoria Falls and the Rand Mines Power Companies get an increased discount of  $2\frac{1}{2}$  per cent. from the date of completion of the Witbank station, they are interested financially in the station being started up at the earliest possible date, apart altogether from the urgency of obtaining additional power.

The Witbank station will be completed and placed in commercial service by the Victoria Falls Company, and, under the agreement, the Commission may, after completion of the maintenance period of twelve months, either itself take over the operation and working of the station or allow the Victoria Falls Company to continue to operate and work the station on the Commission's behalf.

As misapprehension still appears to exist as to certain aspects of the arrangements concluded between the Commission and the Victoria Falls Company, it is necessary to emphasise:—

- (1) that the Victoria Falls and Rand Mines Power Companies are licensed to supply power in the Witwatersrand area, the licences under which they operate having been granted to them by the Government in November, 1910, under the Power Act, 1910 (Transvaal), and that the Companies' rights under these licences can neither be expropriated at this stage nor infringed;
- (2) that the Power Companies' areas of supply and the prices to be charged by them for electricity are laid down in their licences;
- (3) that the Commission has no control whatever over other licensees;
- (4) that a revision in prices was secured by the Commission to power consumers on

the Witwatersrand taking electricity from the Power Companies, notwithstanding what is stated in (3), and that the majority of the contracts between the Power Companies and the mines had still five to eight years to run;

- (5) that the revision in prices ultimately took the following form :

a discount of 15 per cent. retrospectively from 1st January, 1923, and

a further discount of  $2\frac{1}{2}$  per cent. from the time the Witbank station is completed, plus

participation to the extent of 50 per cent. in the Rebate Account, which takes the place of the Participation Account and the 25 per cent. share in surplus profits provided for under Section 25 of the Electricity Act.

Apart from any advantages which may be derived under the Rebate Account, the saving to power consumers on the Rand as a result of the revision in prices approximates £307,000 per annum on the basis of the present rate of power consumption;

- (6) that the Victoria Falls Company was prevented from extending its area of supply beyond the limits within which it was already licensed and that the supply of electricity in the Witbank area was secured to the Commission. The Witbank area will thus get the benefit of the low generation costs at the Witbank station and it will be possible to offer power for industrial purposes in that area at a very low price. While not important as an industrial centre to-day, Witbank affords unique possibilities for big industrial developments, and looking

to the future, and the national importance of being able to offer power to electro-chemical and other industries at a low price, the Commission regards the arrangements it has been able to secure in respect of the Witbank area as not the least important aspect of its Witbank negotiations. One important industry has already decided to transfer from the Reef to Witbank where, because of cheap power, it expects to be able to develop to an extent which could not have been contemplated in its present situation. The interests of the Railway Administration have also been safeguarded in anticipation of railway electrification being proceeded with at some future date on the more congested lines in the Transvaal;

- (7) that the Commission has secured for the Witbank generating station a large block load of power from the Victoria Falls Company, amounting to approximately 400 million units per annum. This is probably the largest single-consumer load ever contracted for and is the means of placing the Commission in a position to produce electricity cheaply enough to encourage the establishment of industries in and around the Witbank area.

Under the agreement between the Commission and the Victoria Falls Company that Company is (subject to certain limitations) required to take all the surplus electricity that can be generated at the Witbank station.

On 6th April, 1925, the Electricity Control Board granted the Commission a licence to establish and carry on an undertaking for the supply of electricity at Witbank, and for that purpose:—

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- (a) to construct and instal or acquire

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- (i) the generating station situate on a site approximately 227·75 acres in extent on the farms “ Witbank ” No. 141, and “ Joubertsrust ” No. 554, which the Victoria Falls Company was authorised to construct under its licence as amended by the Electricity Control Board on 21st July, 1924, together with all plant and apparatus for generating and delivering, transforming, switching and metering electricity, and all plant, machinery, buildings and works incidental to or required in connection with the operation and maintenance of the generating station ;
  - (ii) such transmission and distribution lines, cables, sub-stations and other equipment and such buildings or other works incidental thereto as may be required for supplying electricity in the area and to the consumers authorised under the licence.
- (b) to use, by arrangement, the transmission and distribution systems of the Victoria Falls and the Rand Mines Power Supply Companies, and
  - (c) to carry out the conditions of the agreement, dated 5th July, 1924, entered into between the Commission and the Victoria Falls Company.

The licence provides, *inter alia* :—

- (1) that the Commission may add to, alter or enlarge the works comprising the undertaking, provided that in so doing the rated capacity of the generating station is not increased beyond 120,000 kilowatts ;
- (2) that the area of supply shall be

- (i) an area within a radius of 15 miles from the generating station ;
  - (ii) the railways and property of the South African Railways and Harbours Administration within a radius of 100 miles from Witbank Railway Station and such portion of the railways and property outside the 100-mile radius as forms part of the main line between Witbank and the Portuguese Border near Komati-poort ;
- (3) that, subject to the provisions of the Electricity Act, the Commission is authorised and required to supply electricity to
- (i) any consumer in the area referred to in paragraph (2) ;
  - (ii) the Victoria Falls Company, upon the terms and conditions set out in the agreement, dated 5th July, 1924, between the Commission and the Victoria Falls Company ;
  - (iii) the Municipality of Johannesburg, if and when that Municipality desires to take a supply ; and
  - (iv) the Municipality of Middelburg, if and when that Municipality desires to take a supply ;
- (4) that the standard prices to be charged by the Commission shall be those stated in the first schedule to the licence as amended from time to time in accordance with the provisions of the Electricity Act.

Contracts for plant, equipment and work in connection with the Witbank undertaking have been placed as follows :—

Witbank  
Contracts.



- (i) an area within a radius of 15 miles from the generating station ;
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Contractor.	Plant.
Babcock & Wilcox, Ltd. ...	Power station boilers and boiler house accessories, pipework and pumps, steel buildings, and coal and ash handling plants.
C. A. Parsons & Co., Ltd.	Steam turbines, generators, condensing plant and water cooling plant.
Metropolitan-Vickers Electrical Co., Ltd. ... ..	Transformers and power station switchgear and accessories.
Alexander Jack & Co., Ltd.	Overhead travelling crane.
Drysdale & Co., Ltd. ...	Vertical spindle pumps and motors.
J. Blakeborough & Sons, Ltd. ... ..	Valves, penstocks and fittings for pump house.
Paterson Engineering Co. .	Filtration plant for domestic water.
Stewarts & Lloyds, Ltd.	Water piping, valves, etc.
British Mannesmann Tube Co., Ltd. ... ..	Poles for overhead transmission lines from generating station to pump house at dam.
The Vaughan Crane Co. ...	Crane for pump house.
A. Stuart, Germiston ...	Construction of dam, gauging weir, pump house, residential buildings, excavations, foundations, drainage system, cooling ponds and service reservoir and laying of pipeline.
A. Bradbury & Co., Pietermaritzburg ... ..	Construction of railway siding from Witbank Station to power station site.

Progress  
of Work.

Construction work on the Witbank station is proceeding satisfactorily and it is hoped that the first generating set will be in steam for trial purposes early next year.

The progress made with the various sections of the work is briefly outlined below :—

## SITE WORKS.

The dam on the Great Olifants River is nearing completion and a volume of water sufficient to start up the station has already been conserved. Two photographs of the dam are embodied at the end of this report. The pump house at the dam is almost completed, and the valves, penstocks and fittings for the pump house have arrived on the site. The high level service reservoir is completed.

The following residential quarters have been completed :—

Resident Engineer's house.

Assistant Resident Engineer's house.

Rest house.

Boarding house and housekeeper's quarters.

Three blocks of single quarters.

Five pairs of married quarters.

Five further pairs of married quarters are under construction.

In view of the absence of accommodation for the operating staff in the Witbank Township, it was found necessary to embark upon a large housing programme, and unless there is evidence of some improvement in the housing position at Witbank in the near future, consideration may have to be given to the construction of further residential quarters.

The underground drainage system has been completed, as has also the mass excavations for engine room and boiler house. All boiler house sub-structures are in position and the erection of the main building stanchions is proceeding.

Excavations for the coal staithes have been completed.

The mass excavation for No. 1 Cooling Pond is completed and excavations for No. 2 Pond are nearing completion.

The railway siding from Witbank Railway Station and portion of the permanent sidings on the site have been completed. The temporary construction sidings are completed.

#### OVERSEAS CONTRACTS.

Practically all steelwork for the coal staithes has been shipped.

Under the building contract approximately 1,356 tons of material have been inspected and shipped. The engine room crane has also been shipped.

A considerable quantity of boiler house material, including sections for three boilers, headers for superheaters, mud drums, superheater tubes, and economiser casings have been shipped. Material for the steel chimneys has also been shipped.

The 3 inch and 8 inch dam pumps have been shipped as has also the 15 inch piping for the pipe line from the dam to the station.

Eleven transformers have been assembled and tested.

Work on the other contracts is proceeding satisfactorily.

The station will consist of three turbo-generator sets and twelve boilers.

Each turbo-alternator will have a capacity of 23,500 kilovolt amperes on maximum continuous rating, the aggregate capacity of the main generating plant being 70,500 kilovolt amperes. The station will also contain an auxiliary set of 1,000 kilowatt capacity.

The boilers will each have a normal capacity of 68,000 lbs. of steam per hour, but will be capable of working continuously at 25 per cent. overload.

The generating sets and the boilers will be housed in a steel frame building.

Electricity will be generated at Witbank as three-phase alternating current at a frequency of 50 periods per second and a pressure of 6,600 volts. It will be stepped up to a pressure of 132,000 volts for transmission to the Witwatersrand, while 22,000 volts will be the pressure of the main distribution system in the Witbank area.

Water for the generating station will be obtained from the Great Olifants River, the necessary water rights having been obtained from the Water Court. Servitudes of storage, abutment, aqueduct, right of way, etc., have been secured and are registered in the Commission's name.

A dam has been constructed across the river on the farm "Doornpoort," which forms a storage basin of 211 million cubic feet capacity. From this dam water will be pumped for a distance of four and a half miles to a high level reservoir on the farm "Joubertsrust" whence it will gravitate for a distance of three-quarters of a mile to the generating station.

Approximately 2,500,000 gallons of water per day will be required for circulating, boiler feed and general station purposes.

Concurrently with the construction of the generating station at Witbank, the Victoria Falls Company is proceeding with the erection on its own account of a 132,000 volt transmission line from Witbank to its generating station at Brakpan, where it will link up with the Company's main distribution system along the Reef.

## CAPETOWN UNDERTAKING

Particulars of the negotiations leading up to the decision to establish an undertaking at Capetown were given in the Commission's report, dated 9th July, 1924, upon the establishment of an electricity undertaking at Capetown and in more general terms in the Commission's annual report, dated 9th August, 1924.

Capetown  
Licence.

On 6th April, 1925, a licence was granted to the Commission by the Electricity Control Board to establish and carry on an undertaking for the supply of electricity at Capetown, and for that purpose to construct and/or instal:—

- (a) a generating station on a site approximately 40 acres in extent situate adjacent to the estuary of the Salt River, together with all plant, machinery and apparatus for generating and delivering, transforming, converting, switching and metering electricity, and all plant, machinery, buildings and works incidental to or required in connection with the operation and maintenance of the generating station;
- (b) such transmission and distribution lines, cables, sub-stations and other equipment and such buildings or other works incidental thereto as may be required for supplying electricity in the area and to the consumers authorised under the licence;

The licence provides, *inter alia*:—

- (1) that the Commission may add to, alter or enlarge the works comprising the undertaking, provided that in so doing the rated capacity of the generating station is not increased beyond 50,000 kilowatts;
- (2) that the area of supply shall be

- (i) the area from time to time belonging to the Railways and Harbours Administration within a radius of 110 miles from the generating station ;
  - (ii) an area within five miles on either side of any line of railway situate inside a radius of 110 miles from the generating station as and when any such line of railway is electrified or as and when, for other reasons, a supply of electricity within such area becomes economically practicable, exclusive of the area of jurisdiction of any urban local authority and exclusive of the area of supply of any urban local authority outside the area of jurisdiction of such local authority as approved from time to time by the Control Board, except with the consent of such urban local authority in either case ;
- (3) that, subject to the provisions of the Electricity Act, 1922, the Commission is authorised and required to supply electricity to
- (a) any consumer in the area referred to in paragraph (2), subject to the provisions of that paragraph ;
  - (b) the Corporation of the City of Capetown, as and when required ; and
  - (c) the owner for the time being of the private line of railway at present owned by the Milnerton Estates, Limited, or any extension thereof, for railway traction purposes only ;
- (4) that the standard prices to be charged by the Commission shall be those stated in the first schedule to the licence as amended from time to time in accordance with the provisions of the Electricity Act.

This undertaking forms part of the Capetown Suburban Railway Electrification Scheme.

Main  
Features  
of  
Under-  
taking.

The station will consist of three turbo-generator sets and four boilers. The capacity of each generating set on maximum continuous rating will be 11,100 kilovolt amperes, and the aggregate installed capacity of the station 33,300 kilovolt amperes. The boilers will each have a normal capacity of 60,000 lbs. of steam per hour.

In normal working, two generating sets will be running, taking steam from three boilers. The third generating set and the fourth boiler will be available as a stand-by. The steam pressure of the boilers will be 270 lbs. per square inch. The boilers will be equipped for air pre-heating.

The generating sets and the boilers will be housed in a steel frame building, the whole station being so designed that it will be readily capable of extension.

An agreement has been entered into between the Commission and the Capetown Corporation, providing

- (a) for the new station and the Corporation's existing Dock Road Station being interconnected, and
- (b) for the interchange of power.

The one station will act as a stand-by to the other. This arrangement adds to the security of both stations with a minimum of spare plant in each, and is one which will be mutually advantageous to the Capetown Corporation and the Commission's consumers.

Electricity will be generated as three-phase alternating current at a voltage of 12,000 and a frequency of 50 cycles, that being the system



of generation in the Municipal generating station. Having the same system of generation reduces the cost and simplifies the work of inter-connection.

Traction sub-stations will be provided as follows:—

Milnerton Junction,	}	for the Capetown-Simonstown line.
Claremont,		
Diep River,		
Muizenberg		
Glencairn, and		
Three Anchor Bay	{	for the Sea Point and Table Bay Docks lines.

The six sub-stations will be equipped with step-down transformers and rotary converters, the standard unit being of 2,000 kilowatt capacity.

The sub-stations will be equipped with automatic sets operated from a centralised control in the generating station control room. Provision is also being made for the operation of the sub-stations from the nearest signal cabin or railway station as security against failure of the centralised control, but the railway staff will be called upon to operate the local controls in emergency conditions only. By centralising the operation of the sub-stations, the Control Engineer at the generating station will have the switches at the various sub-stations as well as the track feeder circuit breakers and the starting and stopping of the rotary converters under his direct control. As the Control Engineer who will operate the sub-stations will have complete information of what is happening on the system, this method of control will ensure better service and prompt action in emergencies.

Electricity for the Municipality, for the Milnerton Junction sub-station, and for the Three Anchor Bay sub-station will be transmitted by underground cables at the generator voltage of 12,000.

Power for the Claremont, Diep River, Muizenberg and Glencairn sub-stations will be stepped up to 33,000 volts at the generating station, and transmitted at that voltage by an underground cable, and, as far as Muizenberg, by an overhead transmission line carried on the track structures. Between Muizenberg and Glencairn power will be transmitted by two underground cables.

Electricity will be stepped-down and converted at the traction sub-stations, where it will be supplied to the Railway Administration at 1,500 volts direct current for transmission to the track conductors.

The primary object of the Capetown undertaking is to supply power for the electric operation of the Capetown-Simonstown, Capetown-Sea Point, and Capetown-Table Bay Docks lines, and for any contemplated extension of railway electrification in the vicinity of Capetown, but negotiations are proceeding with a view to the supply of electricity to townships and industries along the route of the railway lines outside the Cape Peninsula.

#### COLENSO UNDERTAKING.

As mentioned in the Commission's Annual Report dated 9th August, 1924, arrangements have been made with the Railway Administration whereby the Colenso undertaking will be taken over by the Commission as soon as the whole of the electrification works between Glencoe Junction and Pietermaritzburg are completed and placed in commercial service.

A Committee, consisting of representatives of the Railway Administration and the Commission, has since been appointed to consider and report upon the question of the date of taking over and other cognate matters.

Requests for electricity were made during the year by local authorities and others along the

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Requests for electricity were made during the year by local authorities and others along the

route of the electrified section of the railway, and in October, 1924, steps were taken by the Commission to carry out a preliminary survey of the electricity requirements of the district for domestic and industrial purposes.

In several instances extensions and renewals to existing municipal generating plants have been postponed in anticipation of supply being available from Colenso, so that the question of providing supply has become one of urgency. In the circumstances, the Railway Administration was approached with a view to the Commission purchasing a bulk supply from the Railway and re-selling it to consumers.

As it is proposed that the Commission should eventually undertake supplies to all consumers from the Colenso undertaking, it was considered desirable, in order to obviate uncertainty on the part of prospective consumers as to their position as between the Railway Administration and the Commission, that the supplies should be given by the Commission from the outset.

The Railway Administration readily agreed, and preliminary negotiations have been concluded with certain Municipalities for taking a bulk supply of power from the Commission as soon as the necessary connections and equipment can be installed.

A permit for the supply of electricity to consumers along the railway route served by the Colenso undertaking was granted to the Commission by the Electricity Control Board on 26th June, 1925. When arrangements have been concluded for taking over the completed undertaking, application will be made to the Control Board for a licence.

A separate report, dated 15th June, 1925, embodying the Commission's immediate proposals in this connection, has been submitted for your approval, in terms of Section 5 of the Electricity Act, and a comprehensive report upon the whole

scheme will be submitted to you as soon as the undertaking has been completed and provisional arrangements made for its being taken over by the Commission.

### DURBAN UNDERTAKING.

A review of the preliminary negotiations with regard to the establishment of an electricity undertaking at Durban was given in the Commission's annual report, dated 9th August, 1924.

On 21st April, 1925, an agreement was entered into between the Commission and the Corporation of the Borough of Durban, providing for the erection by the Commission of a new generating station at Congella, Durban, upon the necessary authority being obtained by the Commission under Section 5 of the Electricity Act, and for a supply of electricity being given to the Durban Corporation from this station.

The agreement provides, *inter alia* :—

- (a) that the new generating station shall be ready for commercial service and for giving supply not later than 31st October, 1927 ;
- (b) that the Commission shall, if required by the Railway Administration to do so, take over from the Corporation the supply to the Railway Administration for the Graving Dock and the Grain Elevator and such other supplies as may be agreed between the Administration and the Commission ;
- (c) that in the event of the Commission taking over from the Corporation a portion or the whole of the existing supplies by the Corporation to the Railway Administration, the number of units which the Corporation is bound to take, namely, 48,000,000, may be reduced by the number of units comprising the existing supplies so taken over by the Commission from the Corporation ;

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- (c) that in the event of the Commission taking over from the Corporation a portion or the whole of the existing supplies by the Corporation to the Railway Administration, the number of units which the Corporation is bound to take, namely, 48,000,000, may be reduced by the number of units comprising the existing supplies so taken over by the Commission from the Corporation ;

- (d) that the new generating station shall be connected to the Corporation's Alice Street station and that so long as the Corporation's station remains in existence the one station will act as a stand-by to the other in cases of emergency, power being exchanged in such cases as required. The Corporation is not bound to maintain its own power station, which may be closed when the Corporation sees fit to do so ;
- (e) that to ensure the co-ordination of electricity production and supply in the interests of the Corporation and the Commission, the present Borough Electrical Engineer shall act as manager of the Commission's undertaking and hold such appointment in addition to his appointment as Borough Electrical Engineer ;
- (f) that any increase in the Corporation's demand after the new generating station is in operation, shall be met from the source of supply which is the more economical to consumers ;
- (g) that, subject to certain stipulations, the agreement shall remain in force for thirty years—or thereafter until terminated by three years notice—from the date of commencement of supply from the new station.

Preliminary work is proceeding. Tenders for plant and equipment are about to be invited and an application to the Electricity Control Board for a licence is in hand.

A separate report upon the Commission's proposals in regard to the Durban undertaking will be submitted to you in due course, in terms of Section 5 of the Electricity Act, 1922.

## SABIE UNDERTAKING.

The problem of electricity supply in the Sabie district was dealt with in the Commission's last annual report.

The revised survey, mentioned in that report, has been concluded, and on 5th June, 1925, a permit was obtained from the Electricity Control Board for the establishment of a hydro-electric undertaking in the Sabie district.

On 19th January, 1925, tenders were invited for the supply and erection of the necessary plant and equipment, and contracts are now being negotiated.

Application has been made to the Water Court for the necessary water rights on the Sabie River and the Water Court sits at Sabie on 4th August next to hear the Commission's application.

The necessary servitudes have been obtained and surface rights applied for.

Owing to the delay in proceeding with the power station on the Sabie River, consequent upon the revision and reduction of consumers' estimates necessitating a modification of the scheme, it has been found necessary, in collaboration with Glynn's Lydenburg, Limited, which is carrying out the work to the Commission's approval, to instal a small hydro-electric plant on the Malieveld Spruit in order to augment the power supply in the Sabie district during the present winter season. Additional power is urgently needed to avoid risk of flooding on some of the mines and to prevent stoppage of development work. The Malieveld plant, which should be ready by August, will be of 450 kilovolt amperes capacity. This plant will be used as a stand-by when the main scheme on the Sabie River comes into operation.

The Commission's proposals in regard to the Sabie undertaking will form the subject of a special report, which will be submitted to you in due course in terms of Section 5 of the Electricity Act.



## MUNICIPAL SCHEMES.

Up to the date of this report forty-nine schemes have been reported upon and supplementary reports upon tenders have been submitted in respect of eighteen schemes. As explained in the Commission's last annual report, reports upon tenders are confined to Municipal schemes in the Cape Province.

During the year under review the following schemes were reported upon:—

CAPE.	TRANSVAAL.
Alice.*	Heidelberg.
Beaufort West.	Johannesburg.
Cala.	Lydenburg.
Cambridge.	Volksrust.
Cathcart.	
Ceres.*	ORANGE FREE STATE.
Cradock.*	Bloemfontein.
East London.	Ladybrand.
George.	Reitz.
Graaff-Reinet.*	
Hopetown.	NATAL.
Humansdorp.*	Dundee.
King William's Town.*	Durban.
Mafeking.*	Paulpietersburg.
Mossel Bay.	Utrecht.
Riversdale.*	
Stellenbosch.	SOUTH-WEST
Umtata.	AFRICA.
Walmer.	
Wellington.	Windhoek.

The Commission has been requested on several occasions to advise municipalities on their schemes in a capacity corresponding to that of consultants. After explaining its position the Commission has, in each case, declined to advise in the manner suggested. It is doubtful, however, whether the constitutional procedure is fully appreciated by some municipalities.

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NOTE.—\* Reports on Tenders only.

While the Commission is most anxious to promote the development and economical supply of electricity in municipal areas in every way open to it, its position under Section 38 of the Electricity Act is that of technical adviser to the Administrators of the respective Provinces. It cannot, therefore, at the same time assume the functions of consultants, nor was it the intention of the Legislature that it should do so.

In dealing with municipal schemes the Commission's aim is to assist municipalities in every possible way. The proposals submitted are reviewed both from a technical and a financial aspect, and where it appears to the Commission that efficiency can be increased, capital expenditure reduced or operating expenses lessened, alterations or modifications in the schemes are recommended accordingly.

#### GENERAL.

The question of appointing overseas agents has been under consideration, and arrangements have been concluded with the High Commissioner for the Union of South Africa in London, whereby the Commission's overseas agency and shipping work will be undertaken by the High Commissioner's Office.

Appointment  
of Overseas  
Agents.

In terms of Section 14 of the Electricity Act, 1922, the Commission submits for the year 1924

Auditors'  
Report and  
Accounts.

As Annexure " A ":

The Report of the Auditors.

As Annexure " B ":

Balance Sheet, duly audited.

As Annexure " C ":

Schedule of Expenditure on Capital Account.

As Annexure " D ":

Schedule to Capital Account, showing the expenses of administration.

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As Annexure " C ":

Schedule of Expenditure on Capital Account.

As Annexure " D ":

Schedule to Capital Account, showing the expenses of administration.

As Annexure " E " :

Schedule showing the price or rent of any land or rights or interests in or over land or any other property acquired or hired by the Commission.

The statements called for under paragraphs (c), (d), (f) and (g) of Section 14 are not available for the following reasons:—

- (1) that the undertakings have not yet reached the revenue-earning stage;
- (2) that all moneys required by the Commission have been advanced by the Government; and
- (3) that, pending the starting up of the undertakings, the Commission has only one fund in operation, viz., the General Fund, the position of which is shown in the Balance Sheet.

By Order of the Commission,

I have the honour to be,

Sir,

Your obedient servant,

A. C. McColm,

SECRETARY.

ANNEXURE " A. "

THE REPORT OF THE AUDITORS.

Johannesburg,  
7th April, 1925.

The Chairman and Members,  
The Electricity Supply Commission,  
Johannesburg.

GENTLEMEN,

We have audited the Books and Accounts of the Commission for the calendar year 1924, and now beg to submit our report thereon.

In terms of Clause 13 (4) of the Electricity Act, 1922, we certify as follows:—

- (a) We have found the Accounts of the Commission to be in order.
- (b) At the end of the year 1924 the Commission had entered into negotiations and engagements in connection with the promotion and construction of power undertakings, thus committing itself to very considerable liabilities. These liabilities not having matured as at 31st December, 1924, are not reflected in the Accounts, but are mentioned in general terms in a note on the Balance Sheet.

Certain expenditure incurred by the Commission to 31st December, 1924, on general administration, Consulting Engineers' fees, etc., had not at that date been allocated over the various undertakings of the Commission. It has been deemed expedient to carry this expenditure forward for apportionment at a later date, as it is considered that the information then available will enable an equitable allocation to be made.

Subject to the above, the Balance Sheet and statements of Capital Expenditure bearing our signatures dated 7th April, 1925, present a true and correct view of the financial position of the Commission.

- (c) In view of the fact that the Commission is as yet not in a position to produce electricity and earn revenue, no provision has been made for redemption or repayment of moneys advanced to the Commission by the Treasury.
- (d) The value of the assets of the Commission is correctly stated.

- (e) The reserve required under Clause 9 of the Electricity Act, 1922, has not yet been established, since no plant has been brought into operation by the Commission as at 31st December, 1924.
- (f) All our requirements and recommendations as Auditors have been complied with and carried out.

An area of ground, in extent 107 morgen 368 square roods, on which the Witbank Power Station is being erected under agreement with the Victoria Falls and Transvaal Power Co., Ltd., has been transferred to and with other rights relating to water supply registered in the name of the Commission. As under the terms of the above-mentioned agreement the Commission has not yet taken over or paid for this land and rights, the same do not appear as an asset in the Balance Sheet.

Yours faithfully,

(Sgd.) ALEX. AIKEN & CARTER.

(Sgd.) B. HALSEY.

ANNEXURE " B. "

# Electricity Supply Commission.

## BALANCE SHEET as at 31st DECEMBER, 1924.

LIABILITIES.	ASSETS.																						
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Loan Account ... ..</td> <td style="text-align: right; vertical-align: bottom;">£63,413 14 2</td> </tr> <tr> <td style="padding-left: 20px;">Treasury of the Union of South Africa.</td> <td></td> </tr> <tr> <td style="padding-top: 10px;">Sundry Creditors ... ..</td> <td style="text-align: right; vertical-align: bottom;">1,547 14 10</td> </tr> <tr> <td colspan="2" style="padding-top: 20px;"> <p>NOTE.—The Commission has entered into certain engagements and negotiations involving considerable liabilities in connection with the establishment of electricity undertakings at Cape-town, Colenso, Durban, Sabie and Witbank.</p> </td> </tr> <tr> <td style="border-top: 1px solid black; border-right: 1px solid black;"></td> <td style="text-align: right; border-top: 1px solid black; border-right: 1px solid black;">£64,961 9 0</td> </tr> <tr> <td style="border-right: 1px solid black; border-top: 3px double black;"></td> <td style="text-align: right; border-top: 3px double black; border-right: 1px solid black;"></td> </tr> </table>	Loan Account ... ..	£63,413 14 2	Treasury of the Union of South Africa.		Sundry Creditors ... ..	1,547 14 10	<p>NOTE.—The Commission has entered into certain engagements and negotiations involving considerable liabilities in connection with the establishment of electricity undertakings at Cape-town, Colenso, Durban, Sabie and Witbank.</p>			£64,961 9 0			<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Expenditure on Capital Account, as per Schedule ... ..</td> <td style="text-align: right; vertical-align: bottom;">£54,414 12 7</td> </tr> <tr> <td style="padding-left: 20px;">Sundry Debtors and Payments in Advance ... ..</td> <td style="text-align: right; vertical-align: bottom;">6,987 6 11</td> </tr> <tr> <td style="padding-top: 10px;">Cash at Bankers ... ..</td> <td style="text-align: right; vertical-align: bottom;">3,559 9 6</td> </tr> <tr> <td style="border-top: 1px solid black;"></td> <td style="text-align: right; border-top: 1px solid black;">£64,961 9 0</td> </tr> <tr> <td style="border-top: 3px double black;"></td> <td style="text-align: right; border-top: 3px double black;"></td> </tr> </table>	Expenditure on Capital Account, as per Schedule ... ..	£54,414 12 7	Sundry Debtors and Payments in Advance ... ..	6,987 6 11	Cash at Bankers ... ..	3,559 9 6		£64,961 9 0		
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Johannesburg,  
6th April, 1925.

Johannesburg,  
7th April, 1925,

(Sgd.) H. J. VAN DER BIJL, Chairman.  
(Sgd.) A. E. HARTE, Accountant.

Certified in terms of our Report of this date,

(Sgd.) ALEX. AIKEN & CARTER, }  
(Sgd.) B. HALSEY, } Auditors.

ANNEXURE " B. "

# Electricity Supply Commission.

## BALANCE SHEET as at 31st DECEMBER, 1924.

LIABILITIES.	ASSETS.
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(Sgd.) B. HALSEY, } Auditors.



# Electricity Supply Commission.

## SCHEDULE OF EXPENDITURE ON CAPITAL ACCOUNT to 31st DECEMBER, 1924.

	Amount Expended to 31/12/23.		Amount Expended during 1924.		Total to 31/12/24.	
	£	s. d.	£	s. d.	£	s. d.
<b>EXPENDITURE IN CONNECTION WITH ELECTRIC POWER UNDERTAKINGS:—</b>						
<i>Capetown Undertaking:</i>						
Preliminary Expenses ...	1,661	9 11	6,426	1 4	8,087	11 3
<i>Colenso Undertaking:</i>						
Preliminary Expenses ...	—		479	15 6	479	15 6
<i>Durban Undertaking:</i>						
Preliminary Expenses ...	1,250	7 0	943	17 6	2,194	4 6
<i>Sabie Undertaking:</i>						
Preliminary Expenses ...	698	13 2	2,754	19 2	3,453	12 4
<i>Witbank Undertaking:</i>						
Preliminary Expenses ...	5,786	18 5	4,478	16 10	10,265	15 3
<i>Head Office:</i>						
Furniture and Office Equipment ...	534	1 2	2,031	1 6	2,565	2 8
	9,931	9 8	17,114	11 10	27,046	1 6
<i>Expenditure for allocation:</i>						
Administration Expenses as per schedule ...	6,362	6 11	15,456	4 9	21,818	11 8
Auditors' Fees and Expenses ...	—		122	8 9	122	8 9
Consulting Engineers' Fees and Expenses ...	673	19 4	3,543	13 2	4,217	12 6
Legal Expenses ...	37	5 6	62	5 0	99	10 6
Insurance Premiums ...	—		8	10 2	8	10 2
Interest (proportion) ...	—		1,101	17 6	1,101	17 6
	£17,005	1 5	£37,409	11 2	£54,414	12 7

Referred to in our Report dated 7th April, 1925.

(Sgd.) Alex. Aiken & Carter }  
(Sgd.) B. Halsey } Auditors.

(Sgd.) A. E. Harte  
Accountant.

# Electricity Supply Commission.

## SCHEDULE OF EXPENDITURE ON CAPITAL ACCOUNT to 31st DECEMBER, 1924.

	Amount Expended to 31/12/23.		Amount Expended during 1924.		Total to 31/12/24.	
	£	s. d.	£	s. d.	£	s. d.
<b>EXPENDITURE IN CONNECTION WITH ELECTRIC POWER UNDERTAKINGS:—</b>						
<i>Capetown Undertaking:</i>						
Preliminary Expenses ...	1,661	9 11	6,426	1 4	8,087	11 3
<i>Colenso Undertaking:</i>						
Preliminary Expenses ...	—		479	15 6	479	15 6
<i>Durban Undertaking:</i>						
Preliminary Expenses ...	1,250	7 0	943	17 6	2,194	4 6
<i>Sabie Undertaking:</i>						
Preliminary Expenses ...	698	13 2	2,754	19 2	3,453	12 4
<i>Witbank Undertaking:</i>						
Preliminary Expenses ...	5,786	18 5	4,478	16 10	10,265	15 3
<i>Head Office:</i>						
Furniture and Office Equipment ...	534	1 2	2,031	1 6	2,565	2 8
	9,931	9 8	17,114	11 10	27,046	1 6
<i>Expenditure for allocation:</i>						
Administration Expenses as per schedule ...	6,362	6 11	15,456	4 9	21,818	11 8
Auditors' Fees and Expenses ...	—		122	8 9	122	8 9
Consulting Engineers' Fees and Expenses ...	673	19 4	3,543	13 2	4,217	12 6
Legal Expenses ...	37	5 6	62	5 0	99	10 6
Insurance Premiums ...	—		8	10 2	8	10 2
Interest (proportion) ...	—		1,101	17 6	1,101	17 6
	£17,005	1 5	£37,409	11 2	£54,414	12 7

Referred to in our Report dated 7th April, 1925.

(Sgd.) Alex. Aiken & Carter }  
(Sgd.) B. Halsey } Auditors.

(Sgd.) A. E. Harte  
Accountant.

ANNEXURE " D. "

# Electricity Supply Commission.

## SCHEDULE TO CAPITAL ACCOUNT at 31st DECEMBER, 1924.

	Amount Expended to 31/12/23.	Amount Expended during 1924.	Total to 31/12/24.
	£    s.    d.	£    s.    d.	£    s.    d.
<b>ADMINISTRATION EXPENSES :</b>			
<i>Salaries, etc.:</i> including Salaries of Commissioners, Head Office Officials and Staff and Travelling Expenses ..	5,708 15 11	13,110 5 3	18,819 1 2
<i>General Establishment Charges:</i> including Office Rent, Telephones, Cables, Telegrams, Stationery, Printing, Advertising and Miscellaneous Office Expenses ...	.653 11 0	2,345 19 6	2,999 10 6
	£6,362 6 11	£15,456 4 9	£21,818 11 8

(Sgd.) A. E. Harte,  
Accountant.

7th April, 1925.

ANNEXURE " D. "

# Electricity Supply Commission.

## SCHEDULE TO CAPITAL ACCOUNT at 31st DECEMBER, 1924.

	Amount Expended to 31/12/23.	Amount Expended during 1924.	Total to 31/12/24.
	£   s.   d.	£   s.   d.	£   s.   d.
<b>ADMINISTRATION EXPENSES :</b>			
<i>Salaries, etc.:</i> including Salaries of Commissioners, Head Office Officials and Staff and Travelling Expenses ..	5,708 15 11	13,110 5 3	18,819 1 2
<i>General Establishment Charges:</i> including Office Rent, Telephones, Cables, Telegrams, Stationery, Printing, Advertising and Miscellaneous Office Expenses ...	.653 11 0	2,345 19 6	2,999 10 6
	£6,362 6 11	£15,456 4 9	£21,818 11 8

(Sgd.) A. E. Harte,  
Accountant.

7th April, 1925.

ANNEXURE " E. "

## Electricity Supply Commission.

Statement showing the price or rent of any land or rights or interests in or over land or any other property acquired or hired by the Commission, as at 31st December, 1924.

WITBANK UNDERTAKING.

Area.		Farm.	District.	Title.	Purchase Price.	Acquired from.	Purposes for which required.	Remarks.	
Morgen.	Square Roods.								
67	26	Witbank No. 141, Portion R.	Middelburg, Transvaal	Freehold, excluding all rights to coal	£255 10 0	Witbank Colliery, Ltd.	Generating Station Site	<p>NOTE.—This property is registered in the name of the Commission; but under agreement with The Victoria Falls and Transvaal Power Company, Limited, all payments in connection therewith have been made by that Company in the first place, hence this property does not appear in the Commission's Balance Sheet at date hereof.</p> <p>NOTE.—Deeds of Servitude in respect of these rights have been registered in favour of the Commission against the titles to the respective properties. Under agreement with The Victoria Falls and Transvaal Power Company, Limited, all payments in connection with the acquisition of these rights are made by that Company in the first place so that the purchase price thereof does not appear in the Commission's Balance Sheet at 31st December, 1924.</p>	
40	342	Joubertsrust No. 554, Portion J.	Middelburg, Transvaal	Freehold, excluding all rights to coal					
11	248	Doornpoort No. 196, Portion S.2	Middelburg, Transvaal	Servitude in Perpetuity	£2,750 0 0	Transvaal and Delagoa Bay Investment Co., Ltd.	Dam and Work		
259	0	Doornpoort No. 196, Portion S.1	Middelburg, Transvaal	Servitude of Storage in Perpetuity					Submerged Ground
0	42	Doornpoort No. 196, Portion S.3	Middelburg, Transvaal	Servitude in Perpetuity					
		Doornpoort No. 196	Middelburg, Transvaal	Right of Way					Access
7	505	Zeekoewater No. 520, Portion S.1, of Portion A	Middelburg, Transvaal	Servitude of Storage in Perpetuity	150 0 0	J. P. Reyneke	Submerged Ground		
		Zeekoewater No. 520	Middelburg, Transvaal	Right of Way					Access for T. & D.B.I. Co., Ltd.

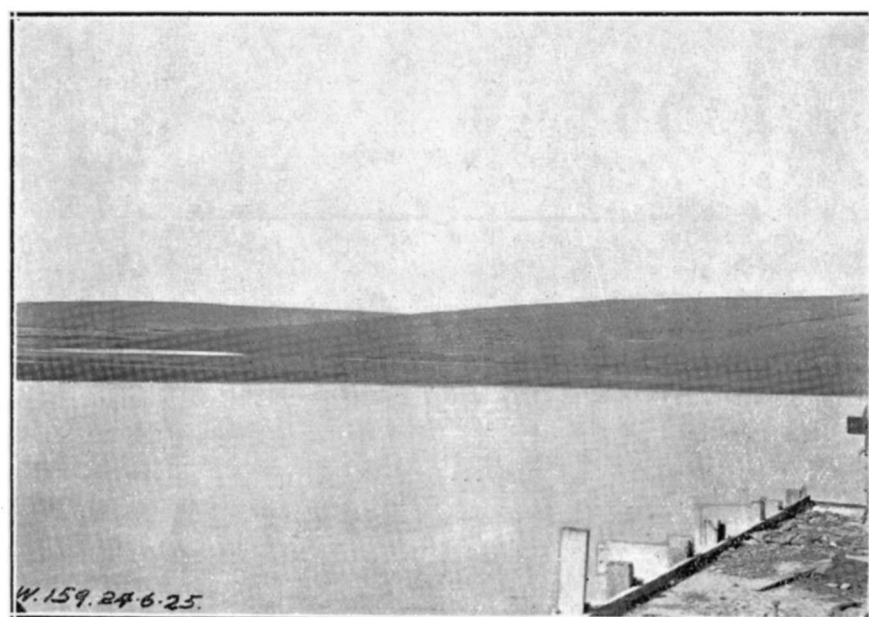
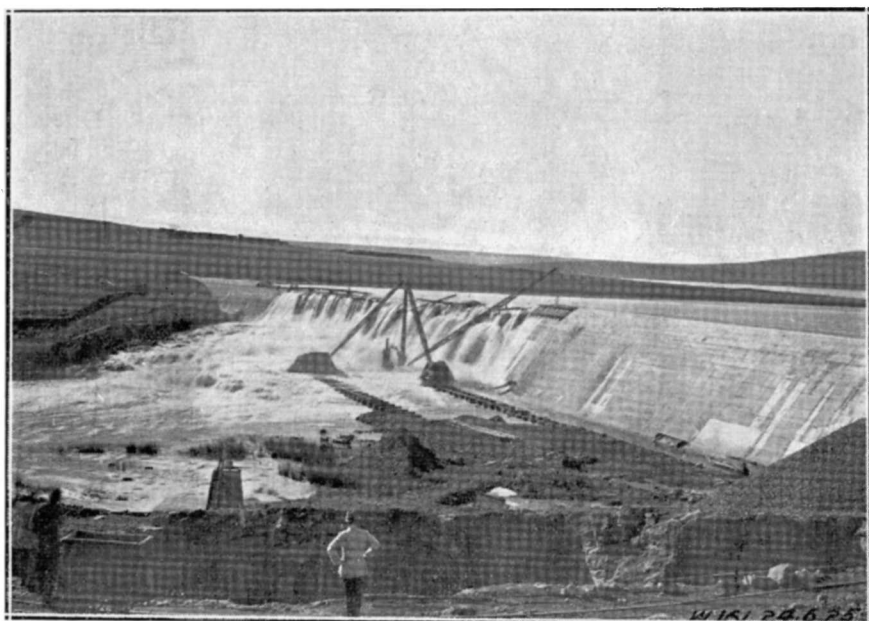
ANNEXURE " E. "

## Electricity Supply Commission.

Statement showing the price or rent of any land or rights or interests in or over land or any other property acquired or hired by the Commission, as at 31st December, 1924.

WITBANK UNDERTAKING.

Area.		Farm.	District.	Title.	Purchase Price.	Acquired from.	Purposes for which required.	Remarks.	
Morgen.	Square Roods.								
67	26	Witbank No. 141, Portion R.	Middelburg, Transvaal	Freehold, excluding all rights to coal	£255 10 0	Witbank Colliery, Ltd.	Generating Station Site	<p>NOTE.—This property is registered in the name of the Commission; but under agreement with The Victoria Falls and Transvaal Power Company, Limited, all payments in connection therewith have been made by that Company in the first place, hence this property does not appear in the Commission's Balance Sheet at date hereof.</p> <p>NOTE.—Deeds of Servitude in respect of these rights have been registered in favour of the Commission against the titles to the respective properties. Under agreement with The Victoria Falls and Transvaal Power Company, Limited, all payments in connection with the acquisition of these rights are made by that Company in the first place so that the purchase price thereof does not appear in the Commission's Balance Sheet at 31st December, 1924.</p>	
40	342	Joubertsrust No. 554, Portion J.	Middelburg, Transvaal	Freehold, excluding all rights to coal					
11	248	Doornpoort No. 196, Portion S.2	Middelburg, Transvaal	Servitude in Perpetuity	£2,750 0 0	Transvaal and Delagoa Bay Investment Co., Ltd.	Dam and Work		
259	0	Doornpoort No. 196, Portion S.1	Middelburg, Transvaal	Servitude of Storage in Perpetuity					Submerged Ground
0	42	Doornpoort No. 196, Portion S.3	Middelburg, Transvaal	Servitude in Perpetuity					
		Doornpoort No. 196	Middelburg, Transvaal	Right of Way					Access
7	505	Zeekoewater No. 520, Portion S.1, of Portion A	Middelburg, Transvaal	Servitude of Storage in Perpetuity	150 0 0	J. P. Reyneke	Submerged Ground		
		Zeekoewater No. 520	Middelburg, Transvaal	Right of Way					Access for T. & D.B.I. Co., Ltd.



Witbank Undertaking. Views of Doornpoort Dam.

The railway siding from Witbank Railway Station and portion of the permanent sidings on the site have been completed. The temporary construction sidings are completed.

#### OVERSEAS CONTRACTS.

Practically all steelwork for the coal staithes has been shipped.

Under the building contract approximately 1,356 tons of material have been inspected and shipped. The engine room crane has also been shipped.

A considerable quantity of boiler house material, including sections for three boilers, headers for superheaters, mud drums, superheater tubes, and economiser casings have been shipped. Material for the steel chimneys has also been shipped.

The 3 inch and 8 inch dam pumps have been shipped as has also the 15 inch piping for the pipe line from the dam to the station.

Eleven transformers have been assembled and tested.

Work on the other contracts is proceeding satisfactorily.

The station will consist of three turbo-generator sets and twelve boilers.

Main  
Features  
of  
Generating  
Station.

Each turbo-alternator will have a capacity of 23,500 kilovolt amperes on maximum continuous rating, the aggregate capacity of the main generating plant being 70,500 kilovolt amperes. The station will also contain an auxiliary set of 1,000 kilowatt capacity.

The boilers will each have a normal capacity of 68,000 lbs. of steam per hour, but will be capable of working continuously at 25 per cent. overload.



The generating sets and the boilers will be housed in a steel frame building.

Electricity will be generated at Witbank as three-phase alternating current at a frequency of 50 periods per second and a pressure of 6,600 volts. It will be stepped up to a pressure of 132,000 volts for transmission to the Witwatersrand, while 22,000 volts will be the pressure of the main distribution system in the Witbank area.

Water for the generating station will be obtained from the Great Olifants River, the necessary water rights having been obtained from the Water Court. Servitudes of storage, abutment, aqueduct, right of way, etc., have been secured and are registered in the Commission's name.

A dam has been constructed across the river on the farm "Doornpoort," which forms a storage basin of 211 million cubic feet capacity. From this dam water will be pumped for a distance of four and a half miles to a high level reservoir on the farm "Joubertsrust" whence it will gravitate for a distance of three-quarters of a mile to the generating station.

Approximately 2,500,000 gallons of water per day will be required for circulating, boiler feed and general station purposes.

Concurrently with the construction of the generating station at Witbank, the Victoria Falls Company is proceeding with the erection on its own account of a 132,000 volt transmission line from Witbank to its generating station at Brakpan, where it will link up with the Company's main distribution system along the Reef.

Contractor.	Plant.
Babcock & Wilcox, Ltd. ...	Power station boilers and boiler house accessories, pipework and pumps, steel buildings, and coal and ash handling plants.
C. A. Parsons & Co., Ltd.	Steam turbines, generators, condensing plant and water cooling plant.
Metropolitan-Vickers Electrical Co., Ltd. ... ..	Transformers and power station switchgear and accessories.
Alexander Jack & Co., Ltd.	Overhead travelling crane.
Drysdale & Co., Ltd. ...	Vertical spindle pumps and motors.
J. Blakeborough & Sons, Ltd. ... ..	Valves, penstocks and fittings for pump house.
Paterson Engineering Co. .	Filtration plant for domestic water.
Stewarts & Lloyds, Ltd.	Water piping, valves, etc.
British Mannesmann Tube Co., Ltd. ... ..	Poles for overhead transmission lines from generating station to pump house at dam.
The Vaughan Crane Co. ...	Crane for pump house.
A. Stuart, Germiston ...	Construction of dam, gauging weir, pump house, residential buildings, excavations, foundations, drainage system, cooling ponds and service reservoir and laying of pipeline.
A. Bradbury & Co., Pietermaritzburg ... ..	Construction of railway siding from Witbank Station to power station site.

Progress  
of Work.

Construction work on the Witbank station is proceeding satisfactorily and it is hoped that the first generating set will be in steam for trial purposes early next year.

The progress made with the various sections of the work is briefly outlined below :—

## SITE WORKS.

The dam on the Great Olifants River is nearing completion and a volume of water sufficient to start up the station has already been conserved. Two photographs of the dam are embodied at the end of this report. The pump house at the dam is almost completed, and the valves, penstocks and fittings for the pump house have arrived on the site. The high level service reservoir is completed.

The following residential quarters have been completed :—

Resident Engineer's house.

Assistant Resident Engineer's house.

Rest house.

Boarding house and housekeeper's quarters.

Three blocks of single quarters.

Five pairs of married quarters.

Five further pairs of married quarters are under construction.

In view of the absence of accommodation for the operating staff in the Witbank Township, it was found necessary to embark upon a large housing programme, and unless there is evidence of some improvement in the housing position at Witbank in the near future, consideration may have to be given to the construction of further residential quarters.

The underground drainage system has been completed, as has also the mass excavations for engine room and boiler house. All boiler house sub-structures are in position and the erection of the main building stanchions is proceeding.

Excavations for the coal staithes have been completed.

The mass excavation for No. 1 Cooling Pond is completed and excavations for No. 2 Pond are nearing completion.

The railway siding from Witbank Railway Station and portion of the permanent sidings on the site have been completed. The temporary construction sidings are completed.

#### OVERSEAS CONTRACTS.

Practically all steelwork for the coal staithes has been shipped.

Under the building contract approximately 1,356 tons of material have been inspected and shipped. The engine room crane has also been shipped.

A considerable quantity of boiler house material, including sections for three boilers, headers for superheaters, mud drums, superheater tubes, and economiser casings have been shipped. Material for the steel chimneys has also been shipped.

The 3 inch and 8 inch dam pumps have been shipped as has also the 15 inch piping for the pipe line from the dam to the station.

Eleven transformers have been assembled and tested.

Work on the other contracts is proceeding satisfactorily.

The station will consist of three turbo-generator sets and twelve boilers.

Main  
Features  
of  
Generating  
Station.

Each turbo-alternator will have a capacity of 23,500 kilovolt amperes on maximum continuous rating, the aggregate capacity of the main generating plant being 70,500 kilovolt amperes. The station will also contain an auxiliary set of 1,000 kilowatt capacity.

The boilers will each have a normal capacity of 68,000 lbs. of steam per hour, but will be capable of working continuously at 25 per cent. overload.

This undertaking forms part of the Capetown Suburban Railway Electrification Scheme.

Main  
Features  
of  
Under-  
taking.

The station will consist of three turbo-generator sets and four boilers. The capacity of each generating set on maximum continuous rating will be 11,100 kilovolt amperes, and the aggregate installed capacity of the station 33,300 kilovolt amperes. The boilers will each have a normal capacity of 60,000 lbs. of steam per hour.

In normal working, two generating sets will be running, taking steam from three boilers. The third generating set and the fourth boiler will be available as a stand-by. The steam pressure of the boilers will be 270 lbs. per square inch. The boilers will be equipped for air pre-heating.

The generating sets and the boilers will be housed in a steel frame building, the whole station being so designed that it will be readily capable of extension.

An agreement has been entered into between the Commission and the Capetown Corporation, providing

- (a) for the new station and the Corporation's existing Dock Road Station being interconnected, and
- (b) for the interchange of power.

The one station will act as a stand-by to the other. This arrangement adds to the security of both stations with a minimum of spare plant in each, and is one which will be mutually advantageous to the Capetown Corporation and the Commission's consumers.

Electricity will be generated as three-phase alternating current at a voltage of 12,000 and a frequency of 50 cycles, that being the system

of generation in the Municipal generating station. Having the same system of generation reduces the cost and simplifies the work of inter-connection.

Traction sub-stations will be provided as follows:—

Milnerton Junction,	}	for the Capetown-Simonstown line.
Claremont,		
Diep River,		
Muizenberg		
Glencairn, and		
Three Anchor Bay	{	for the Sea Point and Table Bay Docks lines.

The six sub-stations will be equipped with step-down transformers and rotary converters, the standard unit being of 2,000 kilowatt capacity.

The sub-stations will be equipped with automatic sets operated from a centralised control in the generating station control room. Provision is also being made for the operation of the sub-stations from the nearest signal cabin or railway station as security against failure of the centralised control, but the railway staff will be called upon to operate the local controls in emergency conditions only. By centralising the operation of the sub-stations, the Control Engineer at the generating station will have the switches at the various sub-stations as well as the track feeder circuit breakers and the starting and stopping of the rotary converters under his direct control. As the Control Engineer who will operate the sub-stations will have complete information of what is happening on the system, this method of control will ensure better service and prompt action in emergencies.

Electricity for the Municipality, for the Milnerton Junction sub-station, and for the Three Anchor Bay sub-station will be transmitted by underground cables at the generator voltage of 12,000.

Power for the Claremont, Diep River, Muizenberg and Glencairn sub-stations will be stepped up to 33,000 volts at the generating station, and transmitted at that voltage by an underground cable, and, as far as Muizenberg, by an overhead transmission line carried on the track structures. Between Muizenberg and Glencairn power will be transmitted by two underground cables.

Electricity will be stepped-down and converted at the traction sub-stations, where it will be supplied to the Railway Administration at 1,500 volts direct current for transmission to the track conductors.

The primary object of the Capetown undertaking is to supply power for the electric operation of the Capetown-Simonstown, Capetown-Sea Point, and Capetown-Table Bay Docks lines, and for any contemplated extension of railway electrification in the vicinity of Capetown, but negotiations are proceeding with a view to the supply of electricity to townships and industries along the route of the railway lines outside the Cape Peninsula.

#### COLENZO UNDERTAKING.

As mentioned in the Commission's Annual Report dated 9th August, 1924, arrangements have been made with the Railway Administration whereby the Colenso undertaking will be taken over by the Commission as soon as the whole of the electrification works between Glencoe Junction and Pietermaritzburg are completed and placed in commercial service.

A Committee, consisting of representatives of the Railway Administration and the Commission, has since been appointed to consider and report upon the question of the date of taking over and other cognate matters.

Requests for electricity were made during the year by local authorities and others along the

Contracts for plant and equipment for the Capetown undertaking have been placed as follows:—

Contractor.	Plant.
Babcock & Wilcox, Ltd. ...	Boiler house equipment and other plant for power station.
James Howden & Co., Ltd.	10,000 kilowatt turbo-alternators.
Head, Wrightson & Co., Ltd. ... ..	Steel frame buildings for power station.
The Mitchell Conveyor and Transporter Co., Ltd. ...	Coal and ash handling plants for power station.
The Mirrlees-Watson Co., Ltd. ... ..	Condensing plant and auxiliary apparatus.
A. Reyrolle & Co., Ltd. ...	Power station switchgear and accessories.
General Electric Co., Ltd.	Sub-station equipment.
Ferguson-Pailin, Ltd. ...	Sub-station switchgear.
Henley's Telegraph Works Co., Ltd. ... ..	Cables.
Siemens-Schuckertwerke .	Unit and power station transformers.
Brown, Boveri & Co., Ltd.	Transformers for step-up sub-station.

The work under these contracts is well in hand.

Shipment of steelwork for the buildings has commenced, and the machinery should commence to arrive early next year.

Tenders have been invited in South Africa, and a contract is under negotiation for the excavations, foundations and other civil engineering works for the generating station.

It is hoped that the undertaking will be completed early in 1927, and that it will be possible to give a supply of electricity for the running of trial trains two or three months earlier.