VERRIGTINGE 1971
Deel 2b
42ste KONVENSIE

18de tot 21ste OKTOBER 1971

KAAPSTAD

Die Vereniging van Munisipale Elektrisiteits-ondernemings van Suid-Afrika

PROCEEDINGS 1971
Volume 2b
42nd CONVENTION

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CAPE TOWN

The Association of Municipal Electricity Undertakings of South Africa

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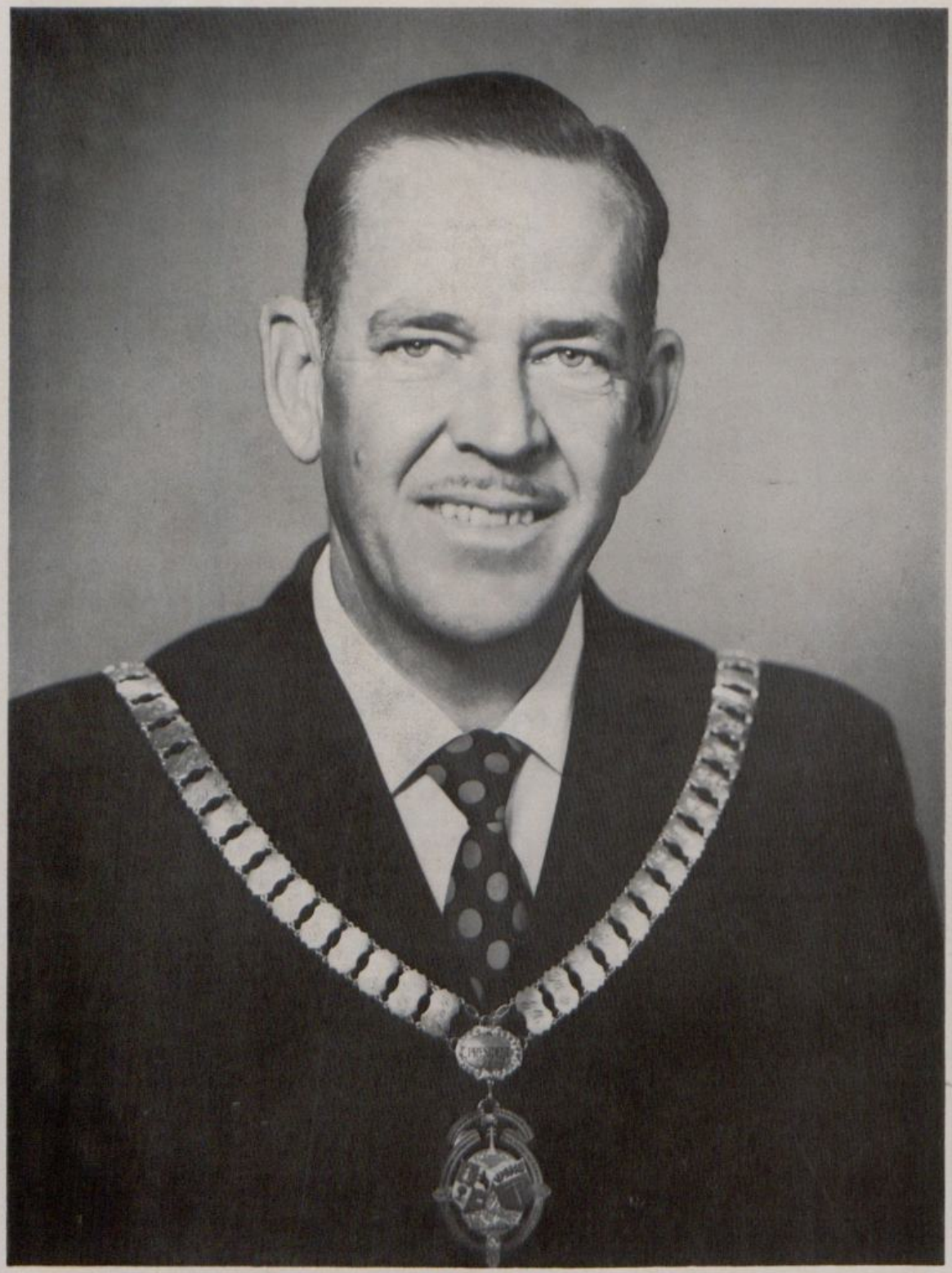

J. K. VON AHLFTEN

EXECUTIVE COUNCIL 1971-1973 UITVOERENDE RAAD

First Row:	D. C. PLOWDEN, Cllr. W. J. A. GILSON, J. C. WADDY, J. K. von AHLFTEN, Cllr. M. P. KOTZE, R. G. EWING, Cllr. C. de KOCK.	**Eerste Ry.**
Second Row:	H. C. DREYER, Cllr. A. D. F. van WYK, P. J. BOTES, Cllr. H. HUGO, Cllr. J. V. van ZYL, E. E. de VILLIERS.	**Tweede Ry.**
Back Row:	Cllr. B. D. EAGER, D. H. FRASER, Cllr. Dr. D. FROST, R. W. BARTON, E. de C. PRETORIUS, K. G. ROBSON.	**Afwesig.**

EXECUTIVE COUNCIL 1971—1973

PRESIDENT:
J. K. von Ahlften (Springs).

PRESIDENT ELECT:
J. C. Waddy (Pietermaritzburg).

ENGINEER MEMBERS:
D. C. Plowden (Johannesburg).
P. J. Botes (Roodepoort).
K. G. Robson (East London).
R. W. Barton (Welkom).
D. H. Fraser (Durban).
E. E. de Villiers (Rustenburg).
H. C. Dreyer (Paarl.
E. de C. Pretorius (Potchefstroom).

CITIES OR TOWNS REPRESENTED:
Springs — Pietermaritzburg — Johannesburg — Paarl — Welkom — Roodepoort — Rustenburg East London — Potchefstroom.

REPRESENTATIVES OF THE REGIONAL BRANCHES:
Natal: K. W. J. Halliday (Port Shepstone).
Cape Eastern: K. J. Murphy (Cradock).
Highveld: F. J. van der Merwe (Carltonville).
Good Hope: W. P. Rattey (Strand).

SECRETARIES:
Davidson & Ewing (Pty.) Ltd.,
P.O. Box 7462,
JOHANNESBURG.

STANDING COMMITTEE:
J. K. von Ahlften, J. C. Waddy, E. de C. Pretorius.

SUB-COMMITTEES:

Papers:
J. K. von Ahlften, J. C. Waddy.

Finance:
J. K. von Ahlften (Convener).
K. G. Robson.

Technical Training:
D. C. Plowden (Convener).
K. G. Robson.
R. W. Barton.
E. E. de Villiers.
E. de C. Pretorius.

Co-ordination of services:
G. C. Theron (Convener).

S.A.B.S. Representation Co-ordinating Committee:
P. J. Botes (Convener).
D. C. Plowden.
E. E. de Villiers.

Electrical Wiremen and Contractors Act: Proposals for Amendment:
J. K. von Ahlften (Convener).
R. W. Barton.
J. C. Waddy.
E. E. de Villiers.

UITVOERENDE RAAD 1971—1973

PRESIDENT:
J. K. von Ahlften (Springs).

AANGEWESE PRESIDENT:
J. C. Waddy (Pietermaritzburg).

INGENIEUR-LEDE:
D. C. Plowden (Johannesburg).
P. J. Botes (Roodepoort).
K. G. Robson (Oos-Londen).
R. W. Barton (Welkom).
D. H. Fraser (Durban).
E. E. de Villiers (Rustenburg).
H. C. Dreyer (Paarl.
E. de C. Pretorius (Potchefstroom).

STEDE OF DORPE VERTEENWOORDIG:
Springs — Pietermaritzburg — Johannesburg — Paarl — Welkom — Roodepoort — Rustenburg Oos-Londen — Potchefstroom.

VERTEENWOORDIGERS VAN STREEKTAKKE.
Natal: K. W. J. Halliday (Port Shepstone).
Oos-Kaapland: K. J. Murphy (Cradock).
Hoëveld: F. J. van der Merwe (Carltonville).
Goeie Hoop: W. P. Rattey (Strand).

SEKRETARIAAT:
Davidson en Ewing (Edms.) Beperk,
Posbus 7462,
JOHANNESBURG.

DAGBESTUUR:
J. K. von Ahlften, J. C. Waddy, E. de C. Pretorius.

ONDERKOMITEES:

Verhandelinge:
J. K. von Ahlften, J. C. Waddy.

Geldsake:
J. K. von Ahlften (Sameroeper).
K. G. Robson.

Tegniese Opleiding:
D. C. Plowden (Sameroeper).
K. G. Robson.
R. W. Barton.
E. E. de Villiers.
E. de C. Pretorius.

Koördinasie van dienste:
G. C. Theron (Sameroeper).

S.A.B.S. Verteenwoordiging Ko-ordinerende Komitee:
P. J. Botes (Sameroeper).
D. C. Plowden.
E. E. de Villiers.

Elektrotegniese Draadwerkers en Kontrakteurs Wet Voorstelle vir Wysiging:
J. K. von Ahlften (Sameroeper).
R. W. Barton.
J. C. Waddy.
E. E. de Villiers.

REPRESENTATIVES:

Electrical Wiremen's Registration Board :
J. K. von Ahlften.

Wiring Regulations Committee:
D. C. Plowden, E. E. de Villiers.

Sub-Committee for High Voltage Laboratory Facilities:
D. .C. Plowden.

S.A. National Committee of the International Electro-Technical Commission:
J. K. von Ahlften.

World Energy Conference:
R. W. Barton.

Electrolysis:
The Town or Electrical Engineer in such areas where the Main and Sub-Committees are established:

S.A. National Committee on Illumination:
R. W. Barton.

Recommendations Committee for new Electrical Commodities:
R. W. Barton (Convener).
E. de C. Pretorius.

Standing Advisory Committee on Electrical Safety:
D. H. Fraser.

C.S.I.R. Advisory Committee for Electrical Engineering:
J. K. von Ahlften.

VERTEENWOORDIGERS:

Registrasieraad vir Elektrotegniese Draadwerkers:
J. K. von Ahlften.

Komitee vir Bedradingsregulasies:
D. C. Plowden, E. E. de Villiers.

Subkomitee vir Hoogspanningslaboratiumgeriewe:
D. .C. Plowden.

S.A. Nasionale Komitee van die Internasionale Elektrotegniese Kommissie:
J. K. von Ahlften.

Wêreld-konferensie insake Energie:
R. W. Barton.

Elektrolise:
Die Stads- of Elektrotegniese Ingenieur in dié gebiede waar die Hoof en Onderkomitees gevestig is.

S.A. Nasionale Komitee vir Verligting:
R. W. Barton.

Komitee vir Aanbevelings insake Nuwe Elektriese Ware:
R. W. Barton (Sameroeper).
E. de C. Pretorius.

Vaste advieskomitee insake Elektriese Beveiliging:
D. H. Fraser.

Die W.N.N.R. se Advieskomitee insake Elektrotegniese Ingenieurwese:
J. K. von Ahlften.

Past Presidents/~~Oud-Presidente~~ :

1915-17	J. H. Dobson (Johannesburg)*
1917-19	J. Roberts (Durban)*
1919-20	B. Sankey (Port Elizabeth)*
1920-22	T. C. W. Dodd (Pretoria)*
1922-24	G. H. Swingler (Cape Town)*
1924-26	J. Roberts (Durban)*
1926-27	B. Sankey (Johannesburg)*
1927-29	J. M. Lambe (East London)*
1929-31	R. Macauley (Bloemfontein)*
1931-33	L. L. Horrell (Pretoria)*
1933-34	L. F. Bickell (Port Elizabeth)*
1935-36	G. G. Ewer (Pietermaritzburg)*
1936-37	A. Rodwell (Johannesburg)*
1937-38	J. H. Gyles (Durban)*
1938-39	H. A. Eastman (Cape Town)
1939-44	I. J. Nicholas (Umtata)
1944-45	A. Rodwell (Johannesburg)*
1945-46	J. S. Clinton (Salisbury)
	J. W. Phillips (Bulawayo)*
1946-47	G. J. Muller (Bloemfontein)
1947-48	C. Kinsman (Durban)
1948-49	A. Foden (East London)
1949-50	D. A. Bradley (Port Elizabeth)
1950-51	C. R. Hallé (Pietermaritzburg)
1958-59	C. G. Downie (Cape Town)
1952-53	A. R. Sibson (Bulawayo)

Secretary and Treasurer/Sekretaris en Tesourier:

F. T. Stokes, E. T. Price
E. Poole*
E. Poole*
L. L. Horrell*
H. A. Eastman
E. Poole*
R. G. Tresise
P. Adkins*
E. Poole*
E. Poole*
F. A. P. Perrow
E. Poole*
E. Poole*
E. Poole*
E. Poole*
E. Poole until 31/12/40*
L. L. Horrell, 1/1/41*
L. L. Horrell*
L. L. Horrell to 30/11/45*
A. T. Taylor, 31/12/45*
A. T. Taylor*
A. T. Taylor*
A. T. Taylor*
A. T. Taylor*
A. T. Taylor*
A. T. Taylor*

1953-54	J. C. Fraser (Johannesburg)*	A. T. Taylor*
1954-55	G. J. Muller (Bloemfontein)	A. T. Taylor*
1955-56	D. J. Hugo (Pretoria)	A. T. Taylor to 30/6/55*
1956-57	J. E. Mitchell (Salisbury)	Arthur Tingey, Ewing & Co., 1/7/55
1957-58	J. L. van der Walt (Krugersdorp)	Davidson & Ewing (Pty.) Ltd., 1/7/56
1958-59	C. G. Downie (Cape Town)	Davidson & Ewing (Pty.) Ltd.
1959-60	R. W. Kane (Johannesburg)	Davidson & Ewing (Pty.) Ltd.
1960-61	R. M. O. Simpson (Durban)	Davidson & Ewing (Pty.) Ltd.
1961-62	C. Lombard (Germiston)	Davidson & Ewing (Pty.) Ltd.
1962-63	P. A. Giles (East London)	Davidson & Ewing (Pty.) Ltd.
1963-64	J. C. Downey (Springs)	Davidson & Ewing (Pty.) Ltd.
1964-65	R. W. Barton (Welkom)	Davidson & Ewing (Pty.) Ltd.
1965-67	D. Murray-Nobbs (Port Elizabeth)	Davidson & Ewing (Pty.) Ltd.
1967-69	G. C. Theron (Vanderbijlpark)	Davidson & Ewing (Pty.) Ltd.
1969-71	H. T. Turner (Umtali)	Davidson & Ewing (Pty.) Ltd.
1971-73	J. K. von Ahlften (SPRINGS)	Davidson & Ewing (Pty.) Ltd.
	*Deceased/Oorlede.	*Deceased/Oorlede.

All correspondence to be addressed to:
The Secretaries,
Davidson & Ewing (Pty.) Ltd.,
P.O. Box 7462, Johannesburg.
Telegrams: "Minute" Phone 834-3021

Rig alle korrespondensie aan:
Die Sekretariaat,
Davidson en Ewing (Edms.) Bpk.,
Posbus 7462, Johannesburg.
Telegramme: „Minute". Foon 834-3021.

LIST OF MEMBERS / LYS VAN LEDE 30-9-71

Honorary Members/Ere-Lede:

1967 Beesley, W., Box/Bus 40, Lusaka, Zambia
1949 Bradley, D. A., 9 Target Kloof Road, Port Elizabeth.*
1960 Castelyn, F. J. C., la Arboretum Avenue, Bloemfontein.*
1963 (1944) Downey, J. C. 10 Jessop Road, Selection Park, Springs.*
1963 (1947) Downie, C. G., 25 Rectory Gardens, Broadwater, Worthing, Sussex.*
1951 (1922) Eastman, H. A., Torwood, Parel Vallei, Somerset West, C.P.*
1948 (1938) Foden, A., 4 Hardy Road, Selborne, East London.*
1969 (1939) Giles, P. A., Box/Bus 384, Pretoria.*
1958 (1944) Hallé, C. R. Box/Bus 399, Pietermaritzburg.*
1969 (1938) Hugo, D., 252 Olivier Street, Brooklyn, Pretoria.*
1961 Frantz, A. C. T.
1956 Jaffray, A. Morton (Alderman), 8 Fairbridge Avenue, Salisbury.
1964 (1946) Kane, R. W., 21 Kernick Avenue, Melrose North, Johannesburg.*
1954 (1938) Kinsman, C., 7 Highgate Place, Durban North.*
1967 Marais, J. D., 101 Gravenhage, Illovo, Johannesburg.
1956 (1939) Milton, W. H., c/o Electricity Supply Commission, Box/Bus 1091, Johannesburg.
1962 (1948 Mitchell, J. E., 1301 Grosvenor Court, Snell Parade, Durban.*
1964 (1934) Muller, G. J., 35 Wilcocks Road, Bloemfontein.*
1969 (1955) Murray-Nobbs, D., 4 Ascot Road, Kemsley Park, Port Elizabeth.*
1968 (1937) Smith, E. L., 1 Ropley, Ross Street, Amamzimtoti.
1962 (1935) Sibson, A. R. Box/Bus 9074, Hillside, Rhodesia.*
1967 Telles, J., Box/Bus 1861, Lourenco Marques.
1962 (1949) van der Walt, J. L., Box/Bus 1091, Johannesburg.*

* Past President * Uitgetrede President

Council Members/Raadslede:

1962 (1935) Adelaide, Box/Bus 38.
1946 (1917) Aliwal North, Box/Bus 46.
1948 (1934) Alberton, Box/Bus 4.
1948 Barberton, Box/Bus 33.
1935 (1926) Beaufort West, Box/Bus 9.
1961 Bedfordview, Box/Bus 3.
1935 (1917) Benoni, Box/Bus 45.
1950 (1919) Bethal, Box/Bus 3.
1944 (1915) Bethlehem, Box/Bus 130.
1939 (1917) Bloemfontein, Box/Bus 288.
1964 Bloemhof, Box/Bus 18.
1936 (1915) Boksburg, Box/Bus 215.
1948 Brakpan, Box/Bus 15.
1948 Brits, Box/Bus 106.
Burgersdorp, Box/Bus 106.
1949 Bothaville, Box/Bus 12.

1966 Bredasdorp, Box/Bus 51.
1935 (1915) Cape Town, Box/Bus 298.
1935 (1916) Cradock, Box/Bus 24.
1960 Carletonville, Box/Bus 3.
1964 Carolina, Box/Bus 24.
1949 Ceres, Box/Bus 44.
1970 Delmas, Box/Bus 6.
1953 (1933) De Aar, Box/Bus 42.
1935 (1915) Durban, Box/Bus 147.
1953 Dewetsdorp, Box/Bus 13.
1962 Dundee, Box/Bus 76.
1935 (1919) East London, Box/Bus 134.
1957 Empangeni, Box/Bus 2.
1967 (1916) Ermelo, Box/Bus 48.
1948 Edenvale, Box/Bus 25.
1935 Eshowe, Box/Bus 37.
1952 Estcourt, Box/Bus 15.
1935 (1927) Fort Beaufort, Box/Bus 36.
1969 (1934) Graaf-Reinet, Box/Bus 71.
1936 (1922) George, Box/Bus 19.
1952 Germiston, Box/Bus 145.
1964 Gobabis, Box/Bus 33.
1936 (1924) Grahamstown, Box/Bus 176.
1947 (1915) Greyton, Box/Bus 71.
1970 Glencoe, Box/Bus 10.
1969 Gordon's Bay, Box/Bus 3.
1949 Heidelberg, Box/Bus 201.
1972 Hennenman, Box/Bus 29.
1959 Hermanus, Box/Bus 20.
1935 (1915) Johannesburg, Box/Bus 1049.
1965 Kakamas, Box/Bus 174.
1964 Keetmanshoop, Box/Bus 25.
1952 Kempton Park, Box/Bus 13.
1935 (1917) Kimberley, Box/Bus 194.
1971 King William's Town, Box/Bus 33.
1968 Howick, Box/Bus 5.
1935 (1916) Klerksdorp, Box/Bus 160.
1935 (1934) Kokstad, Box/Bus 8.
1951 Komga, Box/Bus 21.
1965 Koppies, Box/Bus 14.
1945 (1916) Kroonstad, Box/Bus 302.
1935 (1917) Krugersdorp, Box/Bus 94.
1954 Kenhardt, Box/Bus 15.
1960 Knysna, Box/Bus 21.
1935 (1915) Ladysmith, Box/Bus 29.
1945 Louis Trichardt, Box/Bus 96.
1937 (1927) Ladybrand, Box/Bus 64.
1970 Lichtenburg, Box/Bus 7.
1959 Lydenburg, Box/Bus 61.
1963 Makwassie, Box/Bus 2.
1935 (1926) Mafeking, Box/Bus 42.
1935 Matatiele, Box/Bus 35.
1964 Meyerton, Box/Bus 9.
1965 Messina, Box/Bus 44.
1939 (1929) Middelburg, C.P., Box/Bus 55.
1935 (1926) Middelburg, Tvl., Box/Bus 14.
1954 (1929) Mossel Bay, Box/Bus 25.
1945 Nelspruit, Box/Bus 45.
1948 (1915) Newcastle, Box/Bus 21.
1936 Nigel, Box/Bus 23.
1948 Odendaalsrus, Box/Bus 21.
1959 Orkney, Box/Bus 34.
1944 (1915) Oudtshoorn, Box/Bus 255.
1935 (1926) Paarl, Box/Bus 12.
1969 Phalaborwa, Box/Bus 67.
1935 (1920) Pietersburg, Box/Bus 111.
1935 (1915) Pietermaritzburg, Box/Bus 321.
1936 Piet Retief, Box/Bus 23.
1936 (1934) Port Alfred, Box/Bus 13.
1935 (1915) Port Elizabeth, Box/Bus 116.
1936 Port Shepstone, Box/Bus 5.
1948 (1915) Potchefstroom, Box/Bus 113.
1944 Potgietersrust, Box/Bus 34.
1935 (1915) Pretoria, Box/Bus 440.
1951 Parys, Box/Bus 39.
1953 Postmasburg, Box/Bus 5.
1959 Peri-Urban Areas Health Board, Box/Bus 1341, Pretoria.
1935 (1915) Queenstown, Box/Bus 113.
1935 (1929) Randfontein, Box/Bus 139.
1935 (1929) Roberston, Box/Bus 52.
1935 (1926) Roodepoort-Maraisburg, Box/Bus 217, Roodepoort.
1944 (1920) Rustenburg, Box/Bus 16.
1956 Riversdale, Box/Bus 29.
1965 Saldanha, Box/Bus 22.
1956 Sasolburg, Box/Bus 60.
1935 (1916) Somerset East, Box/Bus 21.
1948 (1927) Somerset West, Box/Bus 19.
1935 (1916) Springs, Box/Bus 45.
Stanger, Box/Bus 72.
1938 (1916) Stellenbosch, Box/Bus 17.
1935 (1915) Standerton, Box/Bus 66.
1959 Stilfontein, Box/Bus 20.
1959 (1927) Tarkastad, Box/Bus 21.
1949 The Strand, Box/Bus 3.
1957 Tzaneen, Box/Bus 24.
1963 Thabazimbi, Box/Bus 90.
1936 (1920) Uitenhage, Box/Bus 45.
1936 (1927) Umtata, Box/Bus 57.
1970 Upington, Box/Bus 17.
1960 Vanderbijlpark, Box/Bus 3.
1949 Ventersdorp, Box/Bus 15.
1935 Vereeniging, Box/Bus 35.
1955 Virginia, Box/Bus 156.
1971 Volksrus, Box/Bus 48.
1947 (1929) Vrede, Box/Bus 155.
1935 Vryburg, Box/Bus 35.
1948 (1920) Vryheid, Box/Bus 57.
1960 White River, Box/Bus 2.
1955 Warmbaths, Box/Bus 48.
1956 Wellington, Box/Bus 12.
1953 Welkom, Box/Bus 708.
1953 Westonaria, Box/Bus 19.
1946 Willowmore, Box/Bus 15.
1944 (1919) Winburg, Box/Bus 26.

1945 (1924) Windhoek, Box/Bus 59.
1955 (1927) Witbank, Box/Bus 3.
1936 (1922) Worcester, Box/Bus 37.
1960 Walvis Bay, Box/Bus 2.
1964 Wolmaransstad, Box/Bus 17.

Dates in brackets initial membership as or by Engineer. Membership not necessarily continuous.

Datums in hakies verteenwoordig eerste lidmaatskap as of deur bemiddeling van Ingenieur, Lidmaatskap nie noodwendig aaneenlopende nie.

Past Members/Voormalige Lede :

1946 Andrew, W. N., 7 Tainton Avenue, Bonnie, Doon, East London.
1951 Atteridge, W. H. Box/Bus 412, Sasolburg, O.F.S.
Barratt, V. E. O., C/r. Marine Drive and Main Street, Port St. Johns.
1964 Barrie, J. J., 82 First Avenue, Dunvegan, Edenvale.
1944 Burton, C. R., 54 Memorial Road, Kimberley.
Campbell, A. R. Box/Bus 3, Impendhle, Natal.
Clinton, J. S., Box/Bus 4648, Johannesburg.
1948 Conradie, J. D. R., Box/Bus1009, Bloemfontein.
1954 Coetzee, F. J., Box/Bus 3, Vanderbijlpark.
1934 Dawson, C., Electricity Supply Commission, Box/Bus 2408, Durban.
1950 Erikson, J. G. F., Box/Bus 24, Margate.
1960 Ford, W. P., Box/Bus 423, Maseru.
1936 Heasman, G. G., Box/Bus 77, Fort Victoria, Rhodesia.
1962 Honiball, G. T., 111 Church Street, Kempton Park, Transvaal.
1970 Jones, J. N., 22 Webmar Court, St. George's Street, Somerset West.
1962 Liebenberg, S. J., Electrical and Mechanical Engineer, Department of Bantu Administration and Development, Box/Bus 384, Pretoria.
1960 McGibbon, J., Box/Bus 1646, Carltonville.
Marchand, B., 19 Elizabeth Avenue, Witbank.
1953 Macques, J. A., Box/Bus 378, Stilfontein.
1948 Matthews, J. A., Box/Bus 616, Kimberley.
1946 Mole, E. W., Box/Bus 118, Bramley Johannesburg.
1926 Muller, H. M. S., Box/Bus 112, Upington, C.P.
1961 Magowan, J. M., Rhodesia Electricity Commission, Box/Bus 377, Salisbury.
Nicholas, I. J., c/o Healdtown Institution, via Fort Beaufort.
Rossler, A., 3 Greenwood Road, Pietermaritzburg.
Rossler, W., 109 Amershan Street, Lynwood Manor, Pretoria.
1948 Woolridge, W. E. L., Box/Bus 24, Harding, Natal.
1947 Williams, J. T., Box/Bus 1617, Pretoria.
1946 Wylie, R. J. S., Box/Bus 217, Germiston.
1957 Zeederberg, T. D., 32 van Riebeeck Street, Pretoria North.

Engineer Members/Ingenieurlede :

1947 Aalbers, C., Municipal Electrical Engineer, Box/Bus 12, Wellington, C.P.
1933 Adams, C.H., Municipal Engineer, Box/Bus 19, Somerset West, C.P.
1965 Barnard, H., Town Electrical Engineer, Box/Bus 15, Brakpan, Transvaal.
1970 Barnard, P. J., Electrical Engineer, Box/Bus 6, Delmas.
1948 Barton, R. W., Electrical Engineer, Box/Bus 708, Welkom, O.F.S.
1959 Beard, G. R., Town Electrical Engineer, Box/Bus 176, Grahamstown.
1971 Bleach, R. L., Town Electrical Engineer, Box/Bus 20, Stilfontein.
1969 Bernhardi, J. L., Borough and Electrical Engineer, Box/Bus 72, Stanger.
1970 Briers, D. B., Electrical Engineer, Box/Bus 302, Kroonstad.
1972 Botha, N. S., Town Electrical Engineer, Box/Bus 57, Vryheid.
1957 Booysens, L., Town Electrical Engineer, Box/Bus 155, Vrede, O.F.S.
1959 Botes, P. J., Municipal Electrical Engineer, Box/Bus 217, Roodepoort.
1958 Brown, D. C., Electrical Engineer, Box/Bus 25, Edenvale.
1970 Brummer, J. G., Electrical Engineer, Box/Bus 17, Stellenbosch.
1971 Bobek, K. H., Borough Electrical Engineer, Box/Bus 37, Eshowe.
1960 Bozycko, W. B., Town Electrical Engineer, Box/Bus 15, Estcourt.
1955 Clarke, M. P. P., Borough Electrical Engineer, Box/Bus 21, Newcastle.
1948 Cherry, J. R., Municipal Electrical Engineer, Box/Bus 139, Randfontein.
1969 Chappell, M. J., City Electrical Engineer, Box/Bus 369, Port Elizabeth.
1965 Cronje, W. F., Electrical Engineer, Peri-Urban Areas Health Board, Box/Bus 1341, Pretoria.
1970 Cosser, C. L., Electrical Engineer, Box/Bus 581, Bulawayo.
1969 Catchpole, T. D., Borough Engineer, Box/Bus 5, Howick.
1955 De Villiers, E. E., Town Electrical Engineer, Box/Bus 16, Rustenburg.
1964 De Villiers, S. de V., Municipal Electrical Engineer, Box/Bus 44, Ceres.
1957 Dreyer, H. C., Electrical Engineer, Box/Bus 12, Paarl.
1950 Dreyer, L., Municipal Electrical Engineer, Box/Bus 19, Westonaria.

1970 Forbes, G., Electrical Engineer, Box/Bus 628, Kimberley.
1966 Fortman, A. H. L., Town Electrical Engineer, Box/Bus 215, Boksburg.
1952 Futcher, L., Municipal Electrical Engineer, Box/Bus 13, Kempton Park.
1965 Fraser, D. H., City Electrical Engineer, Box/Bus 147, Durban.
1970 Gamble, J. S., Electrical Engineer, Box/Bus 255, Oudtshoorn.
1945 Gericke, J. M., Municipal Electrical Engineer, Box/Bus 99, Klerksdorp.
1949 Halliday, K. W. J., Municipal Electrical Engineer, Box/Bus 5, Port Shepstone, Natal.
1953 Haig-Smith, D., Town Electrical Engineer, Box/Bus 113, Queenstown.
1927 Harvey, A. Q., Town Electrical Engineer, Box/Bus 96, Louis Trichardt.
1953 Hatwich, A. T. J., Town and Electrical Engineer, Box/Bus 13, Dewetsdorp, O.F.S.
1965 Haydenrych, J. E., Electrical Engineer, Box/Bus 14, Middelburg, Transvaal.
1970 Hess, I. H., Senior Electrician, Box/Bus 82, Cape Town.
1956 Hobbs, I. L., Town Electrical Engineer, Box/Bus 45, Uitenhage.
1944 Inglis, J. I., Town Electrical and Water Engineer, Box/Bus 111, Pietersburg.
1949 Kirberger, M. N., Town Electrical Engineer, Box/Bus 3, Bethal, Transvaal.
1959 Koeslag, H. J., Electrical Engineer, Box/Bus 52, Robertson.
1949 Kruger, M. J. C., Municipal Electrical Engineer, Box/Bus 13, Port Alfred.
1971 Labuschagne, J. J., Elektrotegniese Stadsingenieur, Box/Bus 86, Walvisbaai.
1956 Lewis, L., Town Electrical Engineer, Box/Bus 59, Windhoek, S.W.A.
1959 Lochner, J. van S., Town Electrical Engineer, Box/Bus 106, Brits.
1949 Lombard, C., City Electrical Engineer, Box/Bus 145, Germiston.
1944 Lotter, G. A., Town Electrical Engineer, Box/Bus 34, Potgietersrust, Transvaal.
1970 Loubser, J. A., Electrical Engineer, Box/Bus 1014, Benoni.
1955 Lynch, E. C., City Electrical Engineer, Box/Bus 73, Salisbury, Rhodesia.
Maclachlan, A. C., Town Electrical Engineer, Box/Bus 22, Saldahna.
1954 McNeil, J. L., Town Electrical Engineer, Box/Bus 8, Kokstad.
1968 McWilliam, E. A., City Electrical Engineer, Box/Bus 423, Pretoria.
1945 Meintjies, P. A., Municipal Electrical Engineer, Box/Bus 16, Rustenburg, Transvaal.
1952 Millen, T. J., Town and Electrical Engineer, Box/Bus 24, Tzaneen, Transvaal.
1929 Mocke, T. M., Town and Electrical Engineer, Box/Bus 23, Piet Retief.
1969 Mostert, S. A., Electrical Engineer, Box/Bus 19, George.
1968 Murphy, K. J., Municipal Electrical Engineer, Box/Bus 24, Cradock.
1964 Odendaal, M. W., Town Electrical Engineer, Box/Bus 4, Alberton.
1957 Paull, R. A., Borough and Electrical Engineer, Box/Bus 2, Empangeni.
1963 Peters, A. G., Town Electrical Engineer, Box/Bus 278, Gwelo, Rhodesia.
1951 Pretorius, D. R., Town Electrical Engineer, Box/Bus 39, Parys, O.F.S.
1952 Pretorius, E. de C., Electrical Engineer, Box/Bus 113, Potchefstroom, Transvaal.
1960 Pretorius, J. W., Electrical Engineer, Box/Bus 23, Nigel, Transvaal.
1966 Pike, E. B., Town Electrical Engineer, Box/Bus 130, Bethlehem.
1968 Psotta, K. U., Elektrotegniese Ingenieur, Box/Bus 25, Keetmanshoop.
1969 Plowden, D. C., General Manager, Electricity Department, Box/Bus 699, Johannesburg.
Potgieter, N. A., Electrical Engineer, Box/Bus 66, Standarton.
1961 Rattey, W. P., Electrical Engineer, Box/Bus 3, Strand.
1948 Reyneke, G. M., Town Electrical Engineer, Box/Bus 26, Winburg.
1968 Robson, K. G., City Electrical Engineer, Box/Bus 529, East London.
1944 Rush, W., Borough Electrical Engineer, Box/Bus 76, Dundee.
1965 Strauss, J. C., Town Electrical Engineer, Box/Bus 60, Sasolburg, O.F.S.
1966 Trautman, E. P. E. W., Town Electrical Engineer, Box/Bus, 29, Ladysmith.
1962 Te Brugge, E. J., Town Electrical Engineer, Box/Bus 42, Mafeking, C.P.
1970 Ten Cate, J. I., Town Electrical Engineer, Box/Bus 7, Lichtenburg.
1946 Theron, G. C., Town Electrical Engineer, Box/Bus 3, Vanderbijlpark.
1945 Theron, W. C., Municipal Electrical Engineer, Box/Bus 37, Worcester, C.P.
1950 Turnbull, A. F., Town Electrical Engineer, Box/Bus 35, Vereeniging.
1931 Turner, H. T., Town Electrical Engineer, Box/Bus 121, Umtali, Rhodesia.
1964 Van den Berg, A. J., Town Electrical Engineer, Box/Bus 94, Krugersdorp, Transvaal.
1964 Van der Merwe, D. S. Electrical Engineer, Box/Bus 3, Witbank.

1955 Van der Merwe, F. J. Municipal Electrical Engineer, Box/Bus 3, Carltonville.
1957 Van Heerden, W. J., Electrical Engineer, Box/Bus 201, Heidelberg, Transvaal.
1956 Van Meerdervoort, J. K. L., Pompe, Town Electrical Engineer, Box/Bus 33, Barberton.
1965 Van Wyk, A. A., Town Electrical Engineer, Box/Bus 9, Meyerton, Transvaal.
1951 Verschoor, D. R., Town Electrical Engineer, Box/Bus 36, Fort Beaufort, C.P.
1957 Von Ahlfen, J. K., Town Electrical Engineer, Box/Bus 45, Springs, Transvaal.
1954 Waddy, J. C., City Electrical Engineer, Box/Bus 399, Pietermaritzburg.

Associates/Geassosieerders :

1971 Adams, C. G., Deputy Electrical Engineer, Box/Bus 69, Port Elizabeth.
1965 Barnard, W., Manager, Maintenance and Operating, Electricity Department, Box/Bus 699, Johannesburg.
1968 Brink, H. J., Section Engineer, Generation, Box/Bus 288, Bloemfontein.
1971 Bamber, F. W., Deputy City Electrical Engineer, Box/Bus 1803, Bulawayo, Rhodesia.
1970 Boyack, I. F., Deputy City Electrical Engineer, Box/Bus 423, Pretoria.
1971 Bobek, K. H., Deputy Electrical Engineer, Box/Bus 37, Eshowe.
1960 Boshoff, J. J. Assistant Electrical Engineer, Box/Bus 3, Vanderbijlpark.
1956 Dawson, J. D., Assistant Electrical Engineer, Box/Bus 45, Uitenhage.
1968 De Vries, G. S., Section Engineer, Distribution, Box/Bus 288, Bloemfontein.
1971 Du Plessis, C. J., Adjunk Stadselektrotegnieseingenieur, Box/Bus 15, Brakpan.
1963 Dn Plooy, D. P., Electrical Engineer, Box/Bus 45, Nelspruit.
1963 Du Plessis, G. C., Deputy Town Electrical Engineer, Box/Bus 113, Potchefstroom.
1968 Gerber, A., Assistant Electrical and Mechanican Engineer, Box/Bus 94, Krugersdorp.
1970 Leigh, R. A., Assistant Manager, Electricity Department, Box/Bus 699, Johannesburg.
1966 Louw, H. A. L., Assistant Electrical Engineer, Box/Bus 12, Paarl, C.P.
1948 McIntyre, H. A., Assistant Town Electrical Engineer, Box/Bus 35, Vereeniging.
1957 Rautenbach, G. F., Deputy Electrical Engineer, Box/Bus 99, Klerksdorp.
1968 Reichert, W. J. Assistant Electrical Engineer, Box/Bus 106, Brits.
1971 Scholes, E. H., Manager (Planning and Technical), Box/Bus 699, Johannesburg.
1956 Sulter, F. J., Assistant Electrical Engineer, Box/Bus 145, Germiston.
1962 Surtees, E. H., Assistant Electrical Engineer, Box/Bus 215, Boksburg.
1966 Trautmann, E. P. E. W., Town Electrical Engineer, Box/Bus 29, Ladysmith.
1967 Van Schalkwyk, A. P., Deputy City Electrical Engineer, Box/Bus 288, Bloemontein.
1971 Weyers, J. D., Assistant Stads-Elektrotegniese Ingenieur, Posbus 218, Randfontein.
1971 Wrigley, P., Deputy Electrical Engineer, Box/Bus 73, Salisbury.
1952 Williams, A. H., Assistant Electrical Engineer, Box/Bus 45, Springs.

Associate Members/Verbonde Lede :

1970 Buisset, J. A., Electrical Engineer, Box/Bus 34, Orkney.
1971 Bosch, D. M., Town Electrical Engineer, Box/Bus 31, Tarkastad.
1971 Claxton, H. D., Electrical Engineer, Box/Bus 71 Graaff-Reinet.
1968 Dauth, W. J., Assistant Electrical Engineer, Box/Bus 48, Volksrust.
1965 De Bruyn, C. D., Town Electrical Engineer, Box/Bus 17, Willowmore, C.P.
1971 Greyling, B. C. B., Elektrotegniese Ingenieur, Box/Bus 48, Ermelo.
1969 Goussard, P. J., Hoof Elektrisiën, Box/Bus 14, Koppies.
1971 Grove, C. R., Hoof Elektrisiën, Box/Bus 43, Harrismith.
1966 Hugo, J. C., Electrical Engineer, Box/Bus 51, Bredasdorp.
1962 Huysamen, G. A., Electrical Engineer, Box/Bus 13, Victoria West.
1969 Jantzen, G. H., Town Electrical Engineer, Box/Bus 206, Aliwal North.
1966 Jooste, P. M., Electrical Engineer, Box/Bus 44 Messina.
1972 Kobus, E. E., Senior Electrician, Box/Bus 5, Postmasburg.
1959 Laas, C. P., Electrical Engineer, Box/Bus 15, Kenhardt.
1956 McNamara, A. B., Electrical Engineer, Box/Bus 21, Komga, C.P.
Munro, J. A., Town Electrical Engineer, Box/Bus 18, Bloemhof.
1971 Nel, J. T. F., Town Electrical Engineer, Box/Bus 33, King William's Town.
1969 Nieuwenhuis, J. F., Electrical Engineer, Box/
1971 Nel, J. T. F., Town Electrical Engineer, Box/Bus 17, Wolmaranstad.
1969 Opperman, D. J., Deputy Electrical Engineer, Box/Bus 45, Springs.
1970 Pagel, P. V. E., Electrical Engineer, Box/Bus 174, Kakamas.
1971 Peens, J. G., Dorpsingenieur, Box/Bus 24, Carolina.

1969 Pretorius, P. J. R., Town Electrical Engineer, Box/Bus 35, Vryburg.
1969 Pieterse, A. C., Electrical Engineer, Box/Bus 64, Ladybrand.
1969 Pollock, T., Electrical Engineer, Box/Bus 3, Gordon's Bay.
1970 Small, C. T. R., Electrical Engineer, Box/Bus 29, Riversdale.
1970 Smith, F. H., Electrical Engineer, Box/Bus 42, Despatch.
1970 Swart, T. L., Electrical Engineer, Box/Bus 10, Glencoe.
1962 Van der Schyff, G. W., Town Electrical Engineer, Box/Bus 3, Bedfordview.
1971 Zwiegelaar, A. G., Chief Electrician, Box/Bus 90, Thabazimbi.

Affiliates—Geaffileerders :

1959 AEG-Telefunken (Pty.) Ltd., Box/Bus 10264, Johannesburg.
1957 Abedare Cables (Africa) Ltd., Box/Bus 494, Port Elizabeth.
1957 Adams, Ripley & Dürr, Box/Bus 31126, Braamfontein.
1957 African Cables Ltd., Box/Bus 172, Vereeniging.
1959 African Explosives & Chemical Industries Ltd., Box/Bus 1122, Johannesburg.
1957 Allenwest S.A. (Pty.) Ltd., Box/Bus 6168, Johannesburg.
1957 Alcan Aluminium of S.A. Ltd., Box/Bus 2430, Johannesburg.
1972 Alucab (Pty.) Ltd., Box/Bus 1742, Johannesburg.
1959 Asea Electric (Pty.) Ltd., Box/Bus 691, Pretoria.
1970 Austevens Enterprises (Pty.) Ltd., Box/Bus 172, Florida.
1957 Aycliffe Cables Ltd., Box/Bus 5244, Johannesburg.
1965 Ballenden & Robb, Box/Bus 4648, Johannesburg.
1957 Brian Colquhoun O'Donnell & Partners (Rhodesia), 10th Floor, Chester House, Speke Avenue, Salisbury.
1959 British Insulated Callender's Cables S.A. Ltd., Box/Bus 2827, Johannesburg.
1957 Brown Boveri Orsal (Pty.) Ltd., Box/Bus 10966, Johannesburg.
1936 W. R. Burnett (Pty.) Ltd., Box/Bus 358, Johannesburg.
1970 Carst, Walker Chemicals (Pty.) Ltd., Box/Bus 5500, Johannesburg.
1970 Chemilite (Pty.) Ltd., Box/Bus 25720, Johannesburg.
1972 Conradie, D. J. J. & Partners, Box/Bus 17031, Groenkloof, Pretoria.
1957 Chloride Electrical Storage Co. S.A. (Pty.) Ltd., Box/Bus 39364, Bramley, Transvaal.
1957 C.M.B. Engineering Co. (Pty.) Ltd., Box/Bus 25655, Denver, Johannesburg.
1959 Construction Electric Co. (Pty.) Ltd., Box/Bus 10100, Johannesburg.
1964 Clinkscales, Maughan-Brown & Partners, Box/Bus 196, Port Elizabeth.
1957 Crompton Parkinson S.A. (Pty.) Ltd., Box/Bus 4236, Johannesburg.
1965 Cullinan Refractors Ltd., P.O. Olifantsfontein, Transvaal.
1957 Davidson & Co. (Africa) (Pty.) Ltd., Box/Bus 616, Springs.
1957 Dowson & Dobson Ltd., Box/Bus 7764, Johannesburg.
1959 Ian Drewett, Box/Bus 25, Johannesburg.
1972 C. A. Du Toit & Partners, Box/Bus 4256, Pretoria.
1970 Dulmison Preformed Line Products S.A. (Pty.) Ltd., 180 Ortman Road, Pietermaritzburg.
1969 Eberhard-Martin (Pty.) Ltd., Box/Bus 128, Roosevelt Park.
1959 Electrical Contractors Association (South Africa), Box/Bus 5327, Johannesburg.
1966 Electrical Protection Co., Box/Bus 570, Benoni.
1972 Egatube Plastic Conduits (Pty.) Ltd., Box/Bus 140, Rosslyn, Pretoria.
1957 Enfield Cables (S.A.) Ltd., Box/Bus 5289, Johannesburg.
1961 Farad (Pty.) Ltd., Box/Bus 31220, Braamfontein, Tranvaal.
1957 Fuchs Electrical Industries Ltd., Box/Bus 758, Alberton, Transvaal.
1969 G.E.C.-English Electric of S.A. (Pty.) Ltd., Box/Bus 2387, Johannesburg.
1957 G.E.C.-Power Distribution Ltd., P.O. Box 13024, Knights, Transvaal.
1959 G.E.C.-A.E.I. of S.A. (Pty.) Ltd., Box/Bus 2406, Johannesburg.
1971 G. R. Hain (Pty.) Ltd., Box/Bus 31126, Braamfontein, Transvaal.
1960 Hawker Siddeley Brush (Southern Africa) Ltd., Box/Bus 67, Germiston.
1962 Haggie Rand Limited, Box/Bus 72, Cleveland.
1970 Hawker Siddeley Electric A.T.W. (Pty.) Ltd., Box/Bus 417, Roodepoort.
1957 Heinnemann Electric (S.A.) Ltd., Box/Bus 99, Bramley, Transvaal.
1957 Hopkinsons S.A. (Pty.) Ltd., Box/Bus 11029, Johannesburg.
1957 Hubert Davies & Co., Ltd., Box/Bus 3762, Johannesburg.
1962 A. Jackson, Box/Bus 4814, Cape Town.
1957 R. T. Jones, Esq., 43 The Avenue, Gardens, Johannesburg.
1968 Kantey, Loteryman, Gardner & Anstey, 44 New Medical Centre, 19 St. James' Road, East London.

1967 Keen's Electrical Distributors (Pty.) Ltd., Box/Bus 2656, Johannesburg.
1972 Max Engineering (Pty.) Ltd., Box/Bus 179, Vereeniging.
1957 L. H. Marthinusen Ltd., Box/Bus 25664, Denver, Transvaal.
1967 Merz & McLellan, Box/Bus 31012, Braamfontein, Transvaal.
1959 N. V. Nederlandsche Kabelfabrieken Ltd., Box/Bus 494, Port Elizabeth.
1972 Ove Orup & Partners, Box/Bus 10389, Johannesburg.
1968 Phillips Lighting Corp. S.A. (Pty.) Ltd., Box/Bus 7148, Johannesburg.
1971 Phosware (Pty.) Ltd., Box/Bus 391, Springs.
1957 Renuert & Lenz Ltd., Box/Bus 92, Johannesburg.
1957 Reyrolle Parsons of S.A. (Pty.) Ltd., Box/Bus 8080, Elandsfontein.
1960 A. Reyrolle & Co. (Rhodesia) Ltd., Box/Bus 1975, Salisbury, Rhodesia.
1971 Republic Power & Communication Co. (Pty.) Ltd., Box/Bus 5440, Johannesburg.
1957 Rice & Diethelm Ltd., Box/Bus 930, Johannesburg.
1967 G. S. Rogers (Pty.) Ltd., Box/Bus 3667, Johannesburg.
1969 Simplex Electric of S.A. (Pty.) Ltd., Box/Bus 7035, Johannesburg.
1957 Scottish Cables (S.A.) Ltd., Box/Bus 2882, Johannesburg.
1960 Siemens S.A. (Pty.) Ltd., Box/Bus 4583, Johannesburg.
1970 Steam and Mining Equipment (Pty.) Ltd., Box/Bus 1039, Johannesburg.
1957 Stone-Stamcor (Pty.) Ltd., Box/Bus 50292, Randburg, Transvaal.
1957 Supercola Ltd., Box/Bus 31386, Braamfontein, Transvaal.
1957 Switchcraft (Pty.) Ltd., Box/Bus 6444, Johannesburg.
1960 South Wales Electric (Pty.) Ltd., Box/Bus 426, Kempton Park.
1967 S.A. National Committee on Illumination, Box/Bus 395, Pretoria.
1960 Thorn Lighting S.A. (Pty.) Ltd., Box/Bus 43075, Industria.
1971 Usco Cable Co. (Pty.) Ltd., Box/Bus 48, Vereeniging.
1969 Wardle & Simpson, Box/Bus 5010, Port Elizabeth.
1965 G. D. Wiehahn, Box/Bus 664, Bethlehem.
1957 Wilson & Herd (Pty.) Ltd., Box/Bus 3093, Johannesburg.
1959 Yorkshire Transformers (S.A.) (Pty.) Ltd., Box/Bus 43, Bedfordview.

The Forty-second Convention of the Association was held in the Camps Bay Civic Centre, Cape Town, from 18th to 1st October, 1971. Attendance at the Convention was as follows :—90 Councils, represented by 61 Councillors and 89 Engineers and Associates; 1 Honorary Member (not representing Councils or Affiliates); 2 Associate Members; 79 Representatives of 37 Affiliates; 46 Visitors (representing Government Departments, Public Utilities and other organisations); 2 Retired Members; 148 Ladies; 6 A.M.E.U. Officials —a total of 434 persons.

Die Twee-en-Veertigste Konvensie van die Vereniging is in die Kampsbaaise Burgersentrum, Kaapstad, van 18 tot 21 Oktober 1971 gehou. Die Konvensie is deur die volgende persone bygewoon :—90 Stadsrade, verteenwoordig deur 61 Raadslede en 89 Ingenieurs en Geassosieerdes; 1 Ere-lid (wat nie Rade of Geaffilieerdes verteenwoordig nie); 2 Geassosieerde lede; 79 Verteenwoordigers van 37 Geaffilieerdes; 46 Besoekers (wat Regeringsdepartemente, Openbare Nutsmaatskappye en ander organisasies verteenwoordig); 2 Afgetrede-lede; 148 Dames en 6 V.M.E.O.-beamptes—altesaam 434 persone.

FIRST DAY

OPENING SESSION

The President, Mr. H. T. Turner, greeted the Convention and called upon the Mayor's Chaplain, Rabbi A. H. Lapin, to open the Proceedings with a prayer.

The President introduced His Worship the Mayor of Cape Town, Councillor R. M. Friedlander, who in extending an official welcome to the City of Cape Town, presented the following address :—

Mnr. die President, u Edele die Adjunk-Minister, my kollega, die Agbare Burgemeester van Springs en ander gaste, dames en here, dis altyd 'n groot voorreg en plesier om ons vriende uit ander dele van Suid-Afrika hier in die moederstad besonder welkom te heet.

Dat hierdie konferensie baie belangrik is, blyk uit die feit dat soveel van die afgevaardigdes nie net uit ander dele van Suid-Afrika kom nie, maar ook verder noord uit Rhodesië en lande van Afrika. En ons is altyd bly en bevoorreg om ons vriende uit dié dele van Afrika in Kaapstad te verwelkom. Soos u reeds gesê het, mnr. die President, het ons gereël om hierdie mooiste maand van Oktober nog so effens mooier te maak vir al ons gaste! Eintlik moet ek 'n bietjie stadig oor die klippe gaan want ek hoor my kollega, die Burgemeester van Springs, het vandag die laaste woord en ek kry geen ander geleentheid om aan u almal welkom te sê nie !

Ladies and gentlemen, you are indeed very welcome here in Cape Town. We hope to show you something of the magnificence of the city by electric light during the course of the conference when the mountain is to be illuminated at night. Of course, it is very beautiful in its own right but when the lights

EERSTE DAG

OPENINGSITTING

Die President, Mnr. H. T. Turner, bring sy groete aan die Konvensie oor en vra die Burgemeester se Kapelaan, Rabbi A. H. Lapin, om die verrigtinge met gebed te open.

Die President stel Sy Agbare die Burgemeester van Kaapstad, Raadslid R. M. Friedlander aan die aanwesiges voor. Raadslid Friedlander verwelkom die afgevaardigdes amptelik in die stad Kaapstad en lewer die volgende rede :—

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are switched on it is something of absolute imagery and true magnificence.

Besides which I hope you will experience a trip up the mountain by electrically-operated cable-car to the towering peak from which there is such a wonderful view over the Cape Peninsula. Here I must pay tribute to the operators of our Cable-Car Company who have, in fact, deferred the annual check-up of the cable-way in preparation for the Christmas season, specially so that you might have this opportunity of going up the mountain the easy way! (laughter). I can assure you it's quite safe because I've been up twice in the last week myself! (applause). In fact, yesterday I even went up by helicopter and got back in one piece! I do recommend this, though, as it is one of the outstanding features of Cape Town.

It is a very interesting fact that the first time electricity was used in Cape Town it was used in our own City Hall—not the present one but the old Town House in Greenmarket Square which has been there since 1755. Admittedly it took another 140 years before they turned the lights on but in 1895 on Saturday, April 13th, the first electricity supply was provided in Cape Town; for the first time electric light was seen here at the southernmost tip of Africa. It

was about time too, Mr. President, because this was 2½ centuries after we first brought the 'enlightenment' which was to 'light up' the whole of the southern part of the continent of Africa in the years that lay ahead.

We have then, as I say, Mr. President, generated electricity to generations of Capetonians and our neighbours and, indeed, I believe it would be well were this situation to continue. Certainly we do at the moment supply electricity to the whole of the immediate Cape Peninsula, i.e. the area abutting the mountain. The Northern areas have other arrangements with their generation although we, in fact, are suppliers of this area. I might just whisper, Mr. President, that we look back with great pride to the fact that we were a 'jewel of light' in the 'area of darkness' which pervaded this part of the Cape Peninsula during the latter part of August! And I should like here and now to pay tribute to our own officials, our own organisation here in the Cape Town City Council area, for their tremendous public service and the way they have devoted themselves to the provision of the needs of our community in this field.

Dames en here, my taak is net vandag om u en u gades hier in die moederstad, van harte welkom te heet. Ons sien mekaar weer vanaand in die Stadssaal, maar intussen hoop ek dat die verrigtings in die beste belang van die hele gemeenskap dwarsdeur Suid-Afrika gaan wees.

To the ladies up in the gallery may I say a particular word of welcome. My wife, unfortunately, cannot be with us here this morning. She is involved in a charity première which will provide the needs for her Christmas and charity fund during the forthcoming Christmas season. Quite frankly, we barely greeted one another this morning before she was off on her rounds. However, we will all meet up—she, you and I—at a later stage of the day in the City Hall at Cape Town where we look forward very much to being able to receive you all.

Again, Mr. President, on behalf of the city, you are indeed welcome here and we wish you every success in your deliberations.

After thanking the Mayor of Cape Town, the President called upon His Worship the Mayor of Springs, Councillor Dr. F. W. Strydom, to welcome delegates to the Convention. Dr. Strydom said :

Nadat hy die Burgemeester van Kaapstad bedank het, vra die President Sy Agbare die Burgemeester van Springs, Raadslid Dr. F. W. Strydom, om die afgevaardigdes by die Konvensie te verwelkom. Dr. Strydom sê :

Mnr. die President; u Edele mnr. du Plessis, Adjunk-Minister van Ekonomiese Sake; u Edelagbare Raadslid Friedlander, Burgemeester van Kaapstad; afgevaardigdes na hierdie 42ste Konvensie van die Vereniging van Munisipale Elektrisiteitsondernemings van Suid Afrika; gaste; dames en here, namens die Stadsraad en die stadsgemeenskap van Springs, die tuis-munisipaliteit van u geagte Aangewese President, mnr. von Ahlften, doen dit my genoeë om u vanmôre hier van harte te welkom by die konvensie.

In the first place, and on behalf of this convention, the Town Council of Springs would like to express its very sincere appreciation to His Worship the Mayor of Cape Town, Councillor Friedlander, to the City Councillors and to the citizens of Cape Town, also to the City Electrical Engineer, Mr. Frantz, for extending to this convention the hospitality of the mother city.

Cape Town, with its grand atmosphere reflecting not only its maturity, historical background, scenic beauty but also at the southernmost hub of large-scale activities in a wide diversity of fields too many to mention—ones of importance to this convention being power installations and large-scale undertakings in the fields of electricity and engineering—is a popular and obvious choice of venue for almost any convention of a national type.

Mr. President, the convention wishes to thank you, to thank His Worship the Mayor of Cape Town, for the temporary, though very much appreciated, freedom of the city extended to the delegates. We thank him for all the arrangements made for the convenience of us as visitors to this wonderful city—the fine weather, all the parties—all of which we sincerely appreciate.

As a past-student of the University of Cape Town I'm very pleased to have the privilege to be back in the city of my alma mater.

Mr. President, you are aware of the fact that the City Electrical Engineer of Cape Town, Mr. Frantz, had in the previous year been ear-marked as the prospective president of this 42nd Convention, but due to the retirement from municipal service early in 1972 of Mr. Frantz and after consultation with him, it was thought advisable to compromise so that the convention would still be held in Cape Town but with the Town Electrical and Mechanical Engineer of Springs as the President—an arrangement for which the Town Council of Springs is indebted and wishes to express its sincere appreciation to the City Council and the City Electrical Engineer of Cape Town.

Ons sluit aan by Sy Edelagbare die Burgemeester van Kaapstad, Raadslid Friedlander, wat betref die verwelkoming aan Sy Edele mnr. du Plessis, die Adjunk-Minister van Ekonomiese Sake, waar hy as hoofgas vanmôre die amptelike openingsrede tot hier-

die konvensie sal lewer. Ons wil hom verseker dat sy teenwoordigheid en optrede hier in amptelike hoedanigheid, wat vir ons 'n weerspieëling is van die owerheid se belangstelling in die werk van die lede van hierdie konvensie, as aansporing en inspirasie dien vir elke afgevaardigde. On dank hom van harte.

Mnr. die President, aan die afgevaardigdes rig ons ook 'n hartlike welkom by hierdie konvensie. Ons spreek die begeerte en hoop uit dat die konvensie sal bydra tot die prestige van u vereniging omdat dit die noodsaaklike bouwerk lewer met betrekking tot alle belangrike aspekte van u vak en omdat alle probleme met moed, volharding en insig te bowe gekom word. In ons snel-ontwikkelende land lewer u onskatbare dienste en u sal al meer geroepe word om dit te doen.

To the guest delegates from our neighbouring states we extend a hearty welcome. They hail from Rhodesia, South West Africa, Angola, Mozambique, Botswana, Swaziland and Lesotho, and we are pleased that as guest delegates they will always have access to the conventions of the Association of Municipal Electricity Undertakings of South Africa.

U sal merk in die program in u besit dat daar vyf belangrike referate gelewer sal word. Hulle sal ook bespreek word. Ons wens u 'n vrugbare bespreking toe en ons dank byvoorbaat die referente.

Mr. President, I wish to refer to one gentleman, a visitor from the United Kingdom, who will deliver an important address. I'm referring to Mr. Goodall, the President of the Electro-technical Commission, who will address you on 'International Standards' covering your specific field. As the President of a body of such high international standing, Mr. Goodall is undoubtedly eminently equipped to address you. To him we extend a most hearty welcome to this Convention.

Mnr. die President, ek dank u vir die geleentheid om die gaste en afgevaardigdes na hierdie 42ste Konvensie te verwelkom.

The President thanked Dr. Strydom and then said :

Die President bedank Dr. Strydom en sê :

Ladies and gentlemen, we are very privileged and very honoured to have with us today to open this 42nd Convention the Hon. the Deputy Minister of Economic Affairs, Mr. A. H. du Plessis. As you know ministers are extremely busy men and we are very proud indeed and very happy that the Minister has found time to come here and do us the honour of opening our Convention. I will now call upon him to do so.

The Hon. the Deputy Minister of Economic Affairs, Mr. A. H. du Plessis :

Sy Edele die Adjunk-Minister van Ekonomiese Sake, mnr. A. H. du Plessis :

Mnr. die President, Agbare Burgemeesters, dames en here, dis vir my aangenaam om vandag hier by u teenwoordig te wees en u toe te spreek. Ek wil u ook dan graag van harte bedank vir hierdie vriendelike uitnodiging wat aan my gerig is.

Laat my toe om onmiddellik te sê dat die ontwikkeling van elektrisiteitsvoorsiening in Suid-Afrika kan, wat betref die ordelikheid daarvan en die vèrsiendheid en moed van die manne wat dit beplan en uitgevoer het, as 'n model vir baie ander nywerheidsondernemings in Suid-Afrika beskou word.

Een van die erkende maatstawwe waarvolgens die peil van 'n land se ekonomiese ontwikkeling gemeet word is sy produksie van elektrisiteit. Suid-Afrika se ontwikkeling tot 'n hoogs-geindustrialiseerde en gevorderde land op tegniese gebied sou gewis nie moontlik gewees het sonder goedkoop elektriese krag nie.

Dit moet dan ook inderdaad as 'n sonderlinge prestasie beskou word dat Suid-Afrika een van die eerste lande ter wêreld was waar elektrisiteitsvoorsiening op 'n handelsgrondslag aangepak is. Ek weet ook van geen ander land waar so 'n klein bevolking so veel so gou op die gebied van elektrisiteitsvoorsiening vermag het nie. Volgens die jongste beskikbare gegewens lewer Suid-Afrika nog steeds sowat 50% van alle elektrisiteit wat op die vasteland van Afrika opgewek word; en dit doen ons met slegs 6% van die vasteland se bevolking en op slegs 4% van sy totale oppervlakte.

Maar miskien is Afrika as geheel vir ons van weinig betekenis en laat ons liewer terugloop op die weg van elektrisiteitsvoorsiening in Suid-Afrika. Soos in die res van die wêreld het die inisiatief vir elektrisiteitsvoorsiening in Suid-Afrika grootliks van ons munisipaliteite uitgegaan en, soos te begrype is, het die groot stedelike sentrums die toon aangegee.

Die voorsiening van elektrisiteit in die Witwatersrandse goudmynbedryf het aanvanklik gekom van kragsentrales wat die verskillende mynhuise vir hul eie behoeftes opgerig het, maar die snelle uitbreiding van die mynboubedrywighede het steeds groter eise aan die krag-installasies gestel.

'n Belangrike mylpaal was die aanname van die Elektrisiteitswet in 1922 waardeur EVKOM gestig is. Die hoofdoel van EVKOM was die voorsiening van elektrisiteit aan alle gebiede, die koördinasie en samewerking van bestaande ondernemings en om sodoende die voorsiening, waar ook al benodig, van goedkoop en voldoende toevoer te bevorder.

In the original Act of 1922, Mr. President, emphasis was laid on the co-ordination of and co-operation between electricity undertakings so that ESCOM was at its inception charged with the duty of seeking ways and means of co-ordination and co-operation of existing undertakings. In terms of the Act, ESCOM had to keep the business of each undertaking separate. Thus various undertakings were established as separate, geographical units, each serving a particular area and having its own set of tariffs.

In the half century since 1922 great changes have occurred. ESCOM's undertakings have been extended and new undertakings have been established: so much so that ESCOM undertakings now have at least one common boundary with another. This period also saw great advances in the engineering techniques; possibly the most striking of which has been the ability to transmit electricity over long distances without significant losses. This has enabled ESCOM to extend the supply system from its peak pithead power stations to remote areas such as the goldfields in the Free State, the Western Transvaal and the Cape Northern area. Similar developments took place in the other licensed areas of ESCOM's other undertakings, particularly in Natal and the Western Cape. The development of high voltage transmission systems also led to the erection of large power stations on the vast Eastern Transvaal coalfields. The inter-connection of these power stations and distribution systems into a single grid system, in turn, enabled ESCOM to instal large generating sets in its power stations.

In 1910 the maximum generator size was about 10 megawatt: by 1975 the generator size will be 500 megawatt—fifty times as large. This is consistent with the growth in electricity demand which has doubled every 10 years on the average and is today about sixty times as much as it was in 1910. At this rate of growth the demand will again double in the next 10 years, and this trend is expected to continue until the end of the present century.

Mr. President, as I said at the beginning, the electrical supply industry in South Africa is known for bold decisions. The events I have outlined supply ample proof that the industry still needs bold decisions. Such a bold decision was taken in the middle of the sixties when it was decided to establish a national electricity supply system which will eventually link all major consumers and power stations all over the country to a common grid.

The proposed inter-connection of the various electricity undertakings to form a national supply system has many advantages but it involves considerable capital expenditure which has to be justified on economic grounds. The integration of the various separate electricity supply systems in South Africa via the national inter-connecting grid, coupled with normal growth, will result in a rapid increase in the capacity of the pooled South African system and is a safeguard for the uninterrupted supply of power throughout the country.

The benefits of an integrated generating system supplying large units are considerable. Let me mention only a few :

1. The capital cost per unit is lower due to the economy of scale.
2. A relatively smaller staff is required for the operation and maintenance of large integrated stations than for the same capacity installed in the multiplicity of smaller separate systems. This is an important consideration, particularly in South Africa with our severe shortage of skilled labour.
3. The larger stations operate at higher pressure and temperatures, using re-heating facilities and are therefore more efficient.
4. A saving is made on reserve plant. Reserve plant required for a greater number of smaller, independent stations tends to be more than for larger, connected stations.
5. Where the periods of peak loads differ from area to area, a connected grid system tends to level out the oscillating demand for current.

Considerations of this type have led all modern countries to integrate their generating capacity. Britain, for example, today has a single national grid of over 40 000 megawatt capacity, which is furthermore interconnected with Scotland via an undersea link with France. France and Italy both have state-established national generating authorities. So have Sweden, Russia and many other communist and non-communist countries.

One noteworthy exception in Western Europe is Germany where the terms of the occupation treaty preclude integration on a single ownership taking place. However, all Western European systems, including the various German systems, are interconnected and buy and sell power over their interconnecting links to improve both efficiency and economy.

The United States utilities have also voluntarily formed pools, the largest of which is approaching 200 000 megawatt. It is gratifying to note that South Africa is also moving in this direction. An important step in this direction was taken this year when Parliament passed an amendment to the Electricity Act enabling ESCOM to establish a single national undertaking for the generation of electricity. Together with the countrywide transmission grid now being established, this will enable all ESCOM's undertakings—and thus all its consumers—to share in the economies that are gained from large power stations established at large collieries designed and operated for that special purpose.

Ek herhaal, mnr. die President, dat ek dit as verblydend beskou dat daar in Suid-Afrika nou daadwerklike stappe gedoen word om die elektrisiteits-

voorsieningsbedryf op 'n rasionale grondslag te plaas. Die beoogde stigting van 'n sentrale kragontwikkelingsonderneming binne EVKOM is vir my 'n duidelike bewys dat selfs binne 'n organisasie soos EVKOM die samevoeging van eensoortige funksies onder één sentrale beheer gebiedend noodsaaklik geword het. Hoeveel te meer is dit dan nie noodsaaklik om hierdie funksies op 'n landswye grondslag saam te snoer nie.

EVKOM het sedert sy stigting in 1922—danksy die koördinering van bestaande ondernemings en samewerking met sulke ondernemings, hoofsaaklik munisipaliteite—die voorsiening van Suid-Afrika se primêre kragbron, elektrisiteit, op 'n grondslag help plaas wat vir die Suid-Afrikaanse ekonomie nie alleen van onskatbare waarde was nie, maar ook onontbeerlik geword het vir die ordelike uitbou van 'n gesonde infrastruktuur. U is almal vertroud met hierdie dinge maar tog wil ek die ander beweegredes en voordele van koördinering en samewerking hier aanstip:

1. Die groot steenkoolafsettings wat ekonomies gunstig is vir die ontwikkeling van elektrisiteit is in Natal, maar veral in Oos-Transvaal, geleë. Hierdie twee gebiede het terselfdertyd ook redelike hoeveelhede water wat vir verkoelingsdoeleindes aangewend kan word. Dit is dus, afgesien van die ander voordele wat ek reeds genoem het, logies om die kragsentrales dáár op te rig want die praktyk bewys dat dit goedkoper is om elektrisiteit met hoëspanningsleidings na die verbruiker te bring as om die steenkool vir plaaslike kragontwikkeling lang afstande per spoor te vervoer, waarvan 'n deel uiteindelik in die vorm van nuttelose as weggegooi moet word.
2. Steenkool-vervoerkoste- volg 'n immer-stygende patroon. Hierteenoor bly die koste van 'n transmissiestelsel grotendeels feitlik onveranderd wanneer die lyne en vernaamste distribusie-stasies eers gebou is. Die voordele daarvan om spoorvervoerkoste deur transmissiekoste te vervang, sal dus met die loop van jare steeds groter word.
3. Wanneer effektiewe tussenverbinding tussen die skag-hoofkragwerk (?) sentrale van die sentrales langs die kus bewerkstellig is, sal verdere besparings moontlik wees deur die stasies as 'n geïntegreerde stelsel te bedryf.
4. Ons beweeg reeds in die rigting van opwekking van elektrisiteit deur middel van kernkrag. Die vraag is nou: hoe moet hierdie nuwe ontwikkeling aangepak word?

Soos u weet is die Raad op Atoomkrag by wet beklee met sekere bevoegdhede in verband met die vreedsame aanwending van kernkrag. EVKOM is ook reeds besig met voorbereidings vir die eerste kernkragstasie langs die weskus van Kaapland.

Met die oog op die koste van so 'n skema en die noodsaaklikheid om kennis en kundigheid saam te voeg, is dit weereens wenslik dat die opwekking van elektrisiteit onder één liggaam, naamlik EVKOM, moet ressorteer; natuurlik met die tegniese bystand van die Atoomkragraad.

'n Ander argument ten gunste hiervan is dat die landswye netwerk uiteindelik gebruik kan word om die elektrisiteit van die kernkragsentrales langs die kus na die binneland terug te voer.

Mnr. die President, u kan tereg vra hoe die ontwikkelings wat ek hierbo geskets het, ons munisipaliteite sal raak. In 1970 het EVKOM se grootmaatverkope van elektrisiteit aan munisipaliteite met 11,63% toegeneem en het hulle derde plek beklee op die ranglys van vernaamste verbruikers. Munisipaliteite is dus, naas die mynbou en nywerhede, die belangrikste verbruikers van elektrisiteit. As 'n mens verder kyk op die snelle en steeds volgehoue ontwikkeling van nuwe dorpsgebiede dan besef jy te meer wat 'n belangrike rol munisipaliteite in die voorsiening van elektrisiteit speel.

Trouens ek wil hier kategories verklaar dat die landswye netwerk wat tans in aanbou is, nie 'n werklikheid kon word sonder die heelhartige samewerking van ons munisipaliteite nie. Laat my 'n tipiese voorbeeld noem: sonder die medewerking van Kaapstad sou die 400 kW kraglyn vanaf Oos-Transvaal na Wes-Kaapland nie nou al gebou kon word nie; of sou dit nie gou 'n ekonomiese proposisie vir die ander verbruikers in Wes-Kaapland kon word nie. En sonder die samewerking met die munisipaliteit van Port Elizabeth sou die 400 kW kraglyn nie vanaf De Aar na Oos-Kaapland afgetak kon word nie.

Sonder hierdie twee groot verbruikers sou dit nie moontlik gewees het om dorpe soos Oudtshoorn, Mosselbaai, George, Knysna, Middelburg, Graaff-Reinet en nog talle ander met die landswye voorsieningstelsel in te skakel nie.

Ek verneem ook dat EVKOM reeds met ons ander groot stede wat nog hul eie kragsentrales bedryf, naamlik Johannesburg, Pretoria en Bloemfontein, 'n ooreenkoms aangegaan het om hulle verdere behoeftes te voorsien, en dat hulle nie verder eie kragsentrales gaan bou nie. Dit is 'n hoogs verblydende ontwikkeling hierdie wat alleen tot groot voordeel van ons hele land kan strek.

EVKOM en ons munisipaliteite vul mekaar volledig aan en noue samewerking tussen hulle is noodsaaklik. Ek het die versekering van EVKOM dat hy te alle tye sy volle samewerking sal gee, en ek twyfel nie daaraan nie dat die munisipaliteite van hul kant ook hul heelhartige samewerking sal gee.

Die ontwikkeling van elektrisiteit verg enorme kapitaal-uitgawe. 'n Kragstasie soos Kriel waarin die allerjongste toerusting en tegnieke gebruik word, sal na raming R300 miljoen kos. Die ontwerp, oprigting en bedryf van so 'n stasie vereis op hulle beurt weer uitgebreide kennis en kundigheid. Hoëspanningsleidings oor lang afstande verg ewe-eens kapitaal en

kennis. Daarom glo ek dat dit ekonomies gesond is dat alle kapitaal-bronne en kundigheid vir hierdie doel meer en meer gekanaliseer moet word in die toekoms.

Elektrisiteitsvoorsiening val egter in twee vakke. Naas die aspekte hierbo genoem is daar die ewebelangrike kleinmaatverspreiding daarvan. In sekere opsigte is hierdie aspek selfs nog belangriker as eersgenoemde. Ons weet almal watter frustrasie en konsternasie 'n skielike kragontbreking kan veroorsaak. Dikwels is die onderbrekings gering van omvang maar steeds ernstig en verg dit onmiddelike aandag.

Ek beskou die munisipaliteit by uitstek as die geskikte instansie om die kleinmaatverspreiding van elektrisiteit in sy gebied te onderneem. In hierdie verband het die plaaslike owerhede reeds baie ondervinding en kundigheid opgedoen en onderneem hulle die taak up 'n bevredigende wyse. Daar is van die kleiner munisipaliteite wat nog nie hierdie funksie van kleinmaatelektrisiteitsverspreiding onderneem nie. Ek vertrou egter dat hulle ter gelegener tyd stappe sal doen om die verspreidingsnetwerke in hulle gebiede oor te neem sodra hulle finansieel daartoe in staat is. EVKOM weet wat sy beleid is en sal alles in sy vermoë doen om oorname van sy netwerke deur munisipali eite te vergemaklik.

Ek wil ten slotte, mnr. die President, die Vereniging alle sukses toewens met sy besprekings tydens hierdie konvensie en die wens uitspreek dat dit baie geslaag en baie vrugbaar sal wees.

President (Mr. H. T. Turner) :

Thank you, Mr. Minister. What you have told us, sir, is indicative quite frankly of the tremendous growth of this wonderful country and also shows the tremendous task that South African ESCOM has so successfully taken on to ensure the economical growth continuing unhindered. On behalf of the Association we thank you for opening this Convention and for the time you've taken to be with us.

Ladies and gentlemen, before introducing you to the new President, I would ask you to allow me a few minutes to review the past two years. I thank you, gentlemen, for electing me as your President in Umtali just over two years ago, to follow in the footsteps of my illustrious predecessor, Mr. Hawie Theron. Just in passing I may say that the town of Umtali is now a city—the third largest city in Rhodesia. We were raised to this status about two weeks ago.

I would like also to pay tribute to and thank the Executive Council whose unfailing support and understanding in all the problems associated with power supply over the vast territory comprising the Republic of South Africa. South West Africa and Rhodesia, has at all times been an inspiration to me in the office I have so much enjoyed as your President.

Of course, when you see the President standing up here, as I am at the moment, bedecked in this beautiful gold chain, the thought is possibly engendered in your minds that the president is a very august-looking and learned man—possibly well fed as well! —versed in all the answers to all the problems which constantly bedevil our Society in so far as the generation and distribution of power is concerned.

Well, I must confess to you that to a great extent this is an illusion! By choosing the right hairdresser, using the best in hair lotions, coupled with the satorial effects of a good tailor, the achievement of being—or appearing to be—a very august and wise president is simple enough! But to get down to knowing the real facts of life and be able to expound

President (mnr. H. T. Turner) :

them ad lib for all and sundry, the President soon enough finds it necessary to lean heavily on the shoulders of the Secretary and his staff for advice and guidance and who, in our case, have been associated with the ups and downs of this Association for more years than I care to remember. Consequently I would like to pay a sincere tribute to our Association Secretary, Mr. Dick Ewing, assisted as always by a very able Miss Elaine Brewin (more affectionately known to most of us as Dick and Elaine) for the oiled wheels on which the affairs of this Association are run. I know that Dick on occasions runs out of oil, especially when the subject of a new constitution is raised as it appears to be doing from time immemorial, but Dick in his own way readily gets things going smoothly again.

Now coupled with Dick as our Secretary, I would like to pay a very warm tribute to his good lady, Mrs. Joy Ewing, who in many ways contributes a tremendous deal to this Association, especially as far as organising the delegates' wives is concerned.

Ek wil graag vandag hulde betuig vir die werk en opofferings van die stadsraadsafgevaardigdes: nie alleen vir hulle wat reeds 'n hele aantal jare leiding gee wat lede van die Uitvoerende bestuur is nie, maar aan almal wat aan die debatte deelgeneem het om luister aan ons vergadering te verleen. Dit is hierdie noue samewerking tussen die tegniese ingenieurs en die lekeraadslede wat bygedra het tot die fenomenale groei en belangrikheid van die Vereniging soos ons dit vandag ken.

I come now, ladies and gentlemen, to the last, but by no means least pleasant task of my term of office as president of this Association, and that is to bedeck your President Elect, Mr. Jules von Ahlften of Springs, with the chain of office and the burdens and pleasures that go with it.

Mr. von Ahlften has been a member of this Association since 1957 and has served on the Execu-

tive Council since 1964. His positive thinking, calm and well-disciplined support and wealth of knowledge of his profession, and his warm and engaging personality have been of the greatest assistance to me in my term of office. And now, Jules, it is my great honour and pleasure, on behalf of the Executive Council of the A.M.E.U., to ask you to come forward and receive the chain of office of this Association.

After receiving his chain of office, the new President, Mr. J. K. von Ahlften, addressed the Convention as follows :

U Edele mnr. die Adjunk-Minister, u Agbare die Burgemeester van Kaapstad, Raadslid Friedlander, u Agbare die Burgemeester van Springs, Raadslid Dr. Strydom, dames en here, laat my eerstens toe om u almal hartelik te bedank vir die eer wat u my vandag hier aangedoen het om my as President van hierdie Vereniging aan te wys. Dis die derde keer dat hierdie eer die dorp van Springs te beurt val en vir hierdie eer aan die dorp en aan myself verleen is ek u opreg dankbaar.

Ongelukkig het die aanvaarding van my presidentskap gepaard gegaan met heelwat plaaslike probleme waaroor ek nie graag verder wil uitwei nie, maar ek moet in besonder Raadslid Kotzé, Voorsitter van ons Bestuurskomitee van die Stadsraad van Springs, hartlik bedank—nie net as raadslid nie maar ook as 'n vriend—dat hy dit vir my moontlik gemaak het om hierdie eer te aanvaar, wat ek as die hoogste eer beskou wat aan 'n munisipale ingenieur toegeken kan word.

Dis vir my ook besonder aangenaam om hier in die Kaap hierdie eer te kon aanvaar want ek het aan die Universiteit van Stellenbosch gestudeer. Ek is ook besonder bly om uit die bywoningslys van afgevaardigdes die name van twee van my leermeesters te sien. Ek verwys eerstens na Dr. Straszacker—hy sal eers môre hier wees—voormalige Professor van Meganiese-Ingenieurs-wese en later Dekaan van die Fakulteit: en na Professor Heydorn, Professor in Elektrotegniese Ingenieurswese, wat vandag hier is as Raadslid van Stellenbosch. Dit is vir my besonder aangenaam om dié twee here by hierdie konvensie te

Nadat hy sy ampsketting ontvang het, spreek die nuwe President, mnr. J. K. von Ahlften, die Konvensie soos volg toe :

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sien.

Ladies and gentlemen, while I'm on my feet I would like to refer to our Rhodesian undertakings. Apart from being a happy occasion as far as the presidential honour is concerned, it is a rather sad one as far as these undertakings are concerned as it is probably the last convention they will be attending in their official capacity as members of this Association. I think, therefore, it was really fitting that a Rhodesian engineer member, my friend Harry Turner, should have been honoured as President during the last two years of their membership of this Association, and it was indeed for me an honour and a privilege to accept this chain of office from Harry Turner.

But, ladies and gentlemen, we won't be rid of our Rhodesian friends so easily! As you probably will have noted the amended Constitution to be presented to you this afternoon, they retain their engineer membership, the only difference being that the undertakings will in future not have any voting or legal rights. The engineer members, however, will most certainly still attend our conventions. This is, in fact, what has been envisaged by our amended Constitution —to have conventions on an international level. So we look forward to having conventions in Rhodesia again in the foreseeable future on the same level and basis as was the case in Lourenco Marques in 1967.

Ladies and gentlemen, I would like to call upon you to show your appreciation in the usual manner for what these undertakings from Rhodesia have meant to us during the many years of their membership since 1935. (very hearty applause).

The Convention proceeded with the election of the President Elect and in proposing Mr. Jack Waddy of Pietermaritzburg to this office, Mr. R. W. Barton (Welkom) said :

As the first non-VIP member to speak at this Convention, may I on behalf of the rank and file congratulate you on your appointment as president, wish you a very happy and successful Convention and an equally happy and successful two years of office. Those of us who knew of your operation are very relieved to see you here this morning. We realise that it hasn't been easy for you and that it's not going to be easy. However, I feel sure that I

Die Konvensie gaan oor tot die verkiesing van die Aangewese President en toe hy mnr. Jack Waddy van Pietermaritzburg vir hierdie amp voorstel, sê mnr. R. W. Barton (Welkom) :

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speak for all of us when I say we will help you all we can; we'll treat you gently. After all, if you're going to sit down for the duration of the conference you wouldn't want your seat to be any hotter than it need be! (laughter)

Mr. President, some years ago members of this Association voted on the question of the holding of conferences annually or bi-annually. There was a unanimous vote that it should be held every year but,

as we all know, we lost on the deal and it is now held every two years. One of the sadder effects of this—it has many disadvantages—is that we can only have half as many presidents because a president now serves for two years instead of one; and very many deserving people do not get to be president. From my point of view there is an easy solution to this—we should simply go back to holding annual conventions! But no doubt if we approach the authorities on this subject, they will have an equally easy solution—they will simply increase the retiring age to 80! (laughter)

That being said, Mr. President, it gives me very great pleasure now to propose our new President Elect in the person of Jack Waddy of Pietermaritzburg.

Mr. Barton proceeded to review Mr. Waddy's career from the time he was born in Canada through his technical training in Great Britain and immigration to South Africa where he joined the staff of the Johannesburg City Council and lastly becoming City Electrical Engineer and Transport Manager of Pietermaritzburg. He mentioned that Mr. Waddy is a Fellow of the London Institute of Electrical Engineers and presently Honorary Vice-President of the South African Institute of Electrical Engineers.

Voortgaande gee mnr. Barton 'n oorsig van mnr. Waddy se loopbaan vanaf sy geboorte in Kanada, déur sy tegniese opleiding in Groot-Brittanje en sy immigrasie na Suid-Afrika, waar hy by die personeel van die Johannesburgse Stadsraad aangesluit en uiteidelik Elektrotegniese Stadsingenieur en Vervoerbestuurder van Pietermaritzburg geword het. Hy meld dat mnr. Waddy 'n Genootlid van die Londense Instituut van Elektrotegniese Ingenieurs is en ook op die oomblik Ere-Vise-President van die S.A. Instituut van Elektrotegniese Ingenieurs.

Seconding the proposal, Councillor M. P. Kotzé (Springs) said :

Toe hy die voorstel sekondeer, sê Raadslid M. P. Kotzé (Springs) :

Dit is vir my 'n besondere genoeë om vir u namens die Stadsraad van Springs geluk te wens vir die eer wat u vanoggend hier te beurt geval het. Ek wil u verseker dat ons baie trots is om ons ingenieur in die presidentstoel hier vanoggend te sien. Ek wil u ook verseker, mnr. die President, dat die Stadsraad van Springs alles in hulle vermoë sal doen om dit vir u moontlik te maak om hierdie taak te behartig. U moet maar net sê wat ons kan doen en wanneer ons vir u moet verlof gee, en wanneer ons u moet Kaap toe stuur om dinge te gaan doen en ons sal maar te bereid wees om dit te doen. U het groot eer na ons dorp toe gebring. Ons sê vir u baie dankie daarvoor.

As there were no further nominations the President announced the unanimous election of Mr. Jack Waddy as President Elect and called him up to the rostrum to take his place at the President's right.

Aangesien daar geen verdere nominasies is nie, kondig die President die eenparige verkiesing van mnr. Jack Waddy as Aangewese President aan en vra hom om sy plek op die rostrum aan die regterkant van die President in te neem.

Mr. Waddy proceeded to address the Convention as follows :

Mnr. Waddy spreek voorts die Konvensie soos volg toe :

I greatly appreciate this houour as I'm quite sure my City Council will as well. Pietermaritzburg was one of the Founder Members of this Association back in 1915 and I will be the third of their engineers to become President of the Association since then. They really appreciate all the good work that the Association had done for electricity undertakings and I am sure they will be glad to take a fuller part in this themselves.

I would like to thank my proposer and seconder, as well as the Executive who played a part in my election as President Elect. For me it's virtually a case of coming back to where I came in since it was in Camps Bay that I attended my first convention 13 years ago. And if there's any bad luck associated with that number I think it's entirely mine in that for all that period I've been able to coast along while others did the work and now I have to face up to doing some myself! However, I can asure you, Mr. President, that whenever you call upon me to assist you I shall be pleased to do so. But, knowing what a hard worker you are, I have a feeling that I'll be able to coast along for another two years yet! In fact, I hope you'll do enough work during your term of office to see the Association through for a further two years afterwards! Thank you.

Dealing with the venue of the 1972 Technical Meeting, the President said :

In verband met die vergaderplek van die Tegniese Vergadering van 1972 sê die President :

Die Uitvoerende komitee het dit goedgedink om hierdie vergadering in Mei volgende jaar te belê op 25 en 26 Mei. Die voorgenome vergaderplek sal wees die Holiday Inn Hotel by Jan Smuts-lughawe. Ek dink dit is 'n baie sentrale plek en behoort homself baie goed te leen aan 'n Tegniese Vergadering. Indien dit u goedkeuring wegdra as konvensie wil ek graag aan u voorlê dat ons Tegniese Vergadering in 1972 gehou sal word in die Transvaal by die Holiday Inn Hotel op 25 en 26 Mei.

The venue was unanimously accepted.

Proceeding with the venue for the next Convention, the President called upon Councillor W. J. A. Gilson (Pietermaritzburg) to speak. Councillor Gilson said :

Die vergaderplek word eenparig aanvaar.

Wat betref die vergaderplek vir die volgende Konvensie, vra die President Raadslid W. J. A. Gilson (Pietermaritzburg) om die Konvensie toe te spreek. Raadslid Gilson sê :

May I first of all echo the words of Councillor Kotzé in saying how pleased we are to see you as President of this Association and also, on behalf of my Council, congratulate your President Elect, Mr. Jack Waddy. You've heard him say that he will coast along. Let me tell you that when I have dealings with the Electricity Department I am the one who coasts along! You always find that where you have somebody prepared to do the work the Chairman has a very easy time, particularly so in the Pietermaritzburg Corporation where we are very fortunate.

Councillor Gilson went on to issue a sincere invitation that the next convention be held in Pietermaritzburg or, failing that, at least in Natal and this was accepted with thanks by the President on behalf of the Convention.

Raadslid Gilson gaan voort deur 'n opregte uitnodiging te rig dat die volgende Konvensie in Pietermaritzburg of, indien nie in daardie stad nie, dan tenminste in Natal gehou word en dit word deur die President namens die Konvensie met dank aanvaar.

The next item on the agenda was the Presidential Address during which the President Elect took the Chair.

Die volgende item op die sakelys is die Presidentsrede, waar gedurende die Aangewese President die stoel inneem.

PRESIDENTSREDE

Deur

J. K. VON AHLFTEN.

ELEKTRIESE EN MEGANIESE STADSINGENIEUR SPRINGS.

'N TOEKOMSBLIK VAN MUNISIPALE ELEKTRISITEITS VOORSIENING IN SUID-AFRIKA

1. Onderwerp van die Rede :

Met die deurblaai van die vorige verrigtinge van hierdie Vereniging vir 'n geskikte onderwerp vir die Presidentsrede, was dit opvallend uit die groot verskeidenheid van onderwerpe, wat deur vorige Presidente behandel is, dat almal 'n gemeenskaplike doel gehad het en dit was om die diens wat deur munisipale elektrisiteitsondernemings gelewer word, steeds te verbeter wat nie net in belang van 'n besondere gemeenskap maar ook in belang van die land in sy geheel sou wees.

Voortspruitend uit 'n ontleding van vorige Presidentsredes is dit ook duidelik dat munisipale elektrisiteitsondernemings al hoe groter wordende eise die

PRESIDENTIAL ADDRESS

By

J. K. VON AHLFTEN.

TOWN ELECTRICAL AND MECHANICAL ENGINEER SPRINGS.

A GLANCE AT THE FUTURE OF MUNICIPAL ELECTRICITY SUPPLY IN SOUTH AFRICA.

1. Subject of the Address :

While searching through the past proceedings of this Association on a suitable subject for the Presidential Address, it was very obvious that the variety of subjects dealt with by past Presidents all had a common purpose in mind and that was to continuously improve the service rendered by municipal electricity supply undertakings which would not only be to the benefit of a specific community but also to the country as a whole.

Emerging from an analysis of past Presidential Addresses it is also clear that municipal electricity undertakings will be faced with ever increasing

hoof sal moet bied om in die behoeftes van die moderne samelewing in die volgende dekades te voorsien. Die vraag kan dus heeltemaal tereg gestel word—**Wat is die toekoms van Munisipale Elektrisiteitsvoorsiening in Suid-Afrika in die lig van hierdie steeds toenemende eise?**

Om aan die steeds toenemende behoeftes van die moderne samelewing in 'n steeds groter wordende metropolis te voorsien, kan ook verwag word dat in die volgende dekades die sogenaamde noodsaaklikheid om munisipale dienste in Suid-Afrika op 'n streeksbasis te rasionaliseer onder die soeklig sal kom.

Onlangs, in 'n uitgawe van die tydskrif „Munisipale en Openhare Dienste" dateer Februarie 1971 word in die redaksionele kommentaar oor die vaspenning en jongste aanpassing van die salarisse van Stadsklerke die volgende opmerkings gemaak :

Nou het sekere munisipaliteite, so wil dit in elk geval lyk, nie die geld om hul stadsklerke meer te betaal nie. Dat meer as een munisipaliteit se geldsake nie juis rooskleuring is nie, is ook geen geheim nie.

Nou wonder 'n mens of dit nie dringend tyd geword het om eerlike oorweging te skenk aan die instelling van streekowerhede nie. Ons land het 'n werkerstekort, ons leef nie meer in die dae van melk en heuning nie, en oorvleuelende dienste is 'n luukse wat ons net nie meer kan bekostig nie. 'n Streekowerheid kan heelparty euwels uitskakel en as die beste manne in so 'n owerheid saamwerk, moet dit eenvoudig beter resultate lewer as versnipperde dienste

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Met watter gesag hierdie sienswyse uitgespreek word en hoevêrre hierop ag geslaan moet word is nie duidelik nie maar dit is my mening dat sover dit ons as munisipale elektriese ingenieurs aanbetref, die tyd geleë is om ons huidige posisie in oënskou te neem en te bepaal wat die algemene toestand in werklikheid is wat hedendaagse munisipale elektrisiteitsvoorsiening in Suid-Afrika betref. Dit is noodsaaklik indien die munisipale elektrisiteitsonderneming sy identiteit wil behou met die steeds toenemende eise wat in die volgende dekades aan munisipale elektrisiteitsvoorsiening in besonder, en elektrisiteitsvoorsiening in sy geheel, gestel gaan word.

2. Huidige Kragopwekking en Voorsiening :

Indien ons nou as munisipale elektriese ingenieurs tot pessimisme geneig was en sonder voorbehoud sou aanvaar dat munisipale elektrisiteitsondernemings nie in staat sal wees om die eise van die toekoms die hoof te bied nie, dan sal hierdie Presidentsrede seer sekerlik moet bekend staan as die kortste wat nog in die geskiedenis van die V.M.E.O. gelewer is aangesien ek hier sou moes afsluit sonder enige verdere bespreking.

Gelukkig het munisipale elektriese ingenieurs in

demands associated with the needs of modern society within the next decades. The question can therefore quite rightly be asked—**What is the future of municipal electricity supply in South Africa in the face of these ever increasing demands?**

In order to meet the demands of modern society within an evergrowing metropolis it can also be expected that within the next decades the so called need for the rationalisation of municipal services on a regional basis in South Africa will be focussed upon.

Recently in an edition of the magazine " Municipal and Public Services " dated February 1971 in the editorial comment on the pegging and recent adjustment in the salaries of Town Clerks, the following remarks are made :

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en gebrek aan samewerking en gesamentlike beplanning.

Terselfdertyd kan 'n aansienlike aantal manne en vroue wat nou vir die lomp munisipale masjien nodig is, vir ander noodsaaklike werk vrygestel word.

As provinsiale owerhede te wille van groter doeltreffendheid in die slag moet bly, behoort ons met grasie vaarwel te sê aan die ou dae, en die nuwe bedeling so spoedig moontlik te laat vlot.

Ons land is in die proses van oorskakeling van 'n „klein" land na 'n moderne, geindustrialiseerde reus en onderwyl getwis word oor hoeveel 'n stadsklerk betaal moet word, gaan kosbare tyd en breinkrag verlore wat so dringend in ander rigtings nodig is.

With what authority these views are being expressed and to what extent heed hereof must be taken is not quite clear but I am of the opinion that as far as we as municipal electrical engineers are concerned, the time is opportune to turn our thoughts to and determine what the situation in general actually is as far as present day municipal electricity supply in South Africa is concerned. This is vital if the municipal electricity undertaking is to retain its identity in the face of the ever increasing demands which will be made upon municipal electricity supply in particular, and electricity supply in general, in the following decades.

2. Present Generation and Supply :

Now if we as municipal electrical engineers were inclined to pessimism and resigned ourselves to the fact that municipal electricity undertakings will not be able to meet the demands of the future, then surely this must go down as the shortest Presidential Address in the history of the A.M.E.U. as this address would have to be concluded right here without any further discussion.

Fortunately, however, municipal electrical en-

die verlede by hierdie konvensies egter reeds bewys dat hulle geen uitdaging aanvaar sonder 'n deeglike ontleding om die regte oplossing te vind nie. Ek wil dus die vertroue uitspreek dat wanneer ons aan die einde van hierdie Konvensie gekom het, ons weereens daarin sal slaag om die uitdaging van die toekoms die hoof te bied.

Teneinde die huidige posisie wat elektrisiteitsopwekking en voorsiening in Suid-Afrika betref, te ontleed, is dit nodig om net kortliks die ontstaan van munisipale elektrisiteitsvoorsiening te skets soos ons dit vandag ken. Dit het sy oorsprong in 1882 toe elektrisiteit vir die eerste keer in Suid-Afrika opgewek is. Namate die dorpe en stede gegroei het is plaaslike kragsentrales en verspreidingsstelsels opgerig in hierdie dorpe en stede om die inwoners van elektrisiteit te voorsien. Met die jare het die aanvraag na hierdie nuwe diens gaandeweg toegeneem maar dit was steeds die belastingbetalers self wat besluit het hoe hulle fondse tot die beste voordeel van die gemeenskap aangewend sou word om in hierdie behoefte te voorsien en dit het dan ook tot vandag hulle demokratiese reg gebly.

Die teenswoordige munisipale elektrisiteitsonderneming is dus die swaar verdiende eiendom van die belastingbetalers self, en ons, die Raadslede en Ingenieurs van vandag, het 'n morele plig teenoor ons belastingbetalers om te verseker dat hierdie diens wat nou so onontbeerlik vir die bestaan van die mens geword het steeds tot die beste van ons vermoë beskikbaar te stel.

Gepaard met die normale ontwikkeling van munisipale elektrisiteitsvoorsiening het die behoefte na elektrisiteit op 'n baie groter skaal begin ontstaan namate die natuurlike hulpbronne van die land ontgin is. Hier dink ons aan die ontstaan en die uitbouing van die goudmynbedryf in ons land, die elektrifisering van ons nasionale spoorwegstelsel, die groot yster en staal bedrywe, die chemiese en petro-chemiese nywerheid en ander verwante groot nywerheidsontwikkeling. Dit was dus voor die handliggend dat om aan hierdie besondere behoefte vir die grootmaat voorsiening van elektrisiteit te kan voldoen dit op nasionale vlak sou geskied teenoor die voorsiening van elektrisiteit op bloot huishoudelike vlak in ons dorpe en stede.

Dit is dan soos ons die posisie vandag ken. 'n Onderneming wat vir kragopwekking en verspreiding op nasionale vlak verantwoordelik is om in die land se groter elektrisiteits behoeftes te voorsien asook aan daardie dorpe en stede waar laasgenoemde nie self hulle eie kragopwekking onderneem nie.

Ongelukkig is dit ook so dat dit juis hier was waar die regte van voorsiening binne die voorsieningsgebied van plaaslike owerhede in baie gevalle op 'n twis uitgeloop het tussen die nasionale en plaaslike voorsienings-owerhede namate die dorpe en stede

gineers have already proved at these conventions that they accept no challenge without a thorough analysis to find the correct solution. I therefore wish to express confidence that when we have come to the end of this Convention, we will once again succeed in facing the challenge of the future.

In order to determine the present situation with the generation and supply of electricity in South Africa, I think it is necessary to briefly reflect upon the past history of municipal electricity supply as we have known it in this country. It has its origin in 1882 when electricity was generated for the first time in South Africa. As the towns and cities grew, local power stations and distribution systems were established by these towns and cities to provide the community with this precious commodity which would further local development. With the years the demand for this service steadily grew but it remained in the hands of the ratepayers themselves to decide how their funds would be spent to the best advantage of the community to provide this service and this has remained their democratic right up to the present day.

The present day municipal electricity undertaking is therefore the hard earned property of the ratepayers themselves, and we, the present day Councillors and Engineers, have a moral duty towards our ratepayers to ensure that this commodity, now so vital for the existence of man, is kept available to the best of our abilities.

Hand in hand with the development of municipal electricity supply came the need for the provision of electricity on a much larger scale as the natural resources of the country were being utilised and here we think of the gold mining industry, the electrification of our national railway system, the vast iron and steel industries, the chemical and petro-chemical industry and other large industrial developments. So it was only natural that the provision of these larger amounts of electricity was to be undertaken on a national level as opposed to the provision of electricity on a purely domestic level in our towns and cities.

This is then the position as we have known it over the past decades, a national authority generating and supplying electricity to meet the larger needs of the bigger consumers in the country as well as of those towns and cities, where these did not generate their own needs.

Unfortunately it was also here where the rights of supply within the area of supply of local authorities was the scene of many a prolonged argument between the national and municipal supply authorities as the towns and cities grew and larger industries within

gegroei het en verwante nywerhede ook binne hierdie gebiede hulle ontstaan gehad het. Dit was natuurlik te verwagte met die vinnige ontwikkeling van hierdie dorpe en stede asook binne die raamwerk van die Elektrisiteitswet van toepassing op elektrisiteitsvoorsiening in Suid-Afrika.

3. Toekomstige Kragopwekking en Voorsiening :

Daar kan by ons egter nie die minste twyfel bestaan nie dat die dekade sewentig en die daaropvolgende dekades eise aan hierdie nywerheid gaan stel wat ongeëwenaard sal staan teenoor die behoeftes van die verlede wat elektrisiteitsvoorsiening in Suid-Afrika betref.

Die jongste syfers in EVKOM se verslag toon aan dat in 1970 die geinstalleerde kragopwekkings vermoë van EVKOM reeds op 7 583 megawatt te staan gekom het, munisipaliteite en ander ondernemings op 3 000 megawatt—'n totaal van 10 600 megawatt. Dit word beraam dat teen 1975 die totale geinstalleerde kragopwekkings vermoë op 14 700 megawatt te staan sal kom. Die vermoë van onafhanklike ondernemings sal heelwaarskynlik op 3 000 megawatt bly staan aangesien EVKOM in toekoms die alleen opwekker van elektrisiteit in die Republiek sal wees. Indien 'n groeikoers van tussen 7% en 8% toegelaat word, gebaseer op die gemiddelde syfer vir 1968/69 dan kan verwag word dat in die jaar 1980 die geinstalleerde vermoë op 17 500 megawatt te staan sal kom, waarvan na raming munisipale elektrisiteitsondernemings minstens 'n derde (1968 se syfer was reeds 23%) sal absorbeer vir verdere kleinmaat verspreiding, inagnemende dat die groot stede ook in toekoms deur EVKOM met elektrisiteit voorsien sal word. Dit verteenwoordig 'n ontsaglike munisipale elektrisiteitsvoorsienings nywerheid opgeweeg teen enige standaarde. Die feit wat ons moet aanvaar is dat 'n nasionale kragopwekkings-owerheid gekom het om te bly teenoor suiwer plaaslike kragopwekking, wat noodsaaklik is, nie net vir tegniese maar ook vir ekonomiese redes om in die Republiek se toekomstige elektrisiteits behoeftes te kan voorsien.

Dit is egter ook 'n feit dat die kleinmaat verspreiding van elektrisiteit deur plaaslike owerhede aan hulle verbruikers, of hulle nou huishoudelik, kommersieël of industrieël mag wees, binne die gelisensieerde voorsieningsgebied van die plaaslike owerheid nie net die demokratiese reg maar ook plig van daardie owerheid is en moet bly.

Hier wil ek graag verwys na die verslag van die subkomitee insake voorsieningsregte wat in 1970 tydens die Tegniese Vergadering in Potchefstroom aan die Vereniging voorgelê was, waarin die huidige toestand duidelik opgesom word :—

> „Gebeurtenisse gedurende die afgelope jaar dui daarop dat die bou van enige munisipale kragsentrale in die toekoms uiters onwaarskynlik

these areas were being established. This was only to be expected with the fast developing towns and cities and within the concepts of the Electricity Act controlling the supply of electricity in South Africa.

3. Future Generation and Supply :

There can be no doubt in our minds that the decade of the seventies and following decades will impose demands on the electricity supply industry unprecedented in the past history of this country's electricity needs.

The latest figures in the ESCOM report indicate that in 1970 the installed generating capacity by ESCOM was already 7 583 megawatt, municipalities and other undertakings some 3 000 megawatt—giving a total of some 10 600 megawatt. It is estimated that by 1975 the total installed generating capacity will be some 14 700 megawatt. The capacity of independent undertakings is likely to remain at about 3 000 megawatt since ESCOM will be the sole generation authority in the Republic in future. If a growth rate of between 7% and 8% is allowed based on the 1968/69 figure, then the expected demand by 1980 will 17 500 megawatt of which municipal electricity undertakings will, taking into account that the larger cities will be supplied by ESCOM in future as well, be absorbing at least one third for retail distribution (this figure was already 23% in 1969). This represents a formidable municipal electricity supply industry by any standards. A fact that we have to accept today is that a national generation authority has come to stay, as opposed to local generation, which is essential to meet the Republic's future needs, not only for technical but also economic reasons.

It is however also a fact that the retail distribution of electricity by a local authority to its various consumers, be they domestic, commercial or industrial within the licensed area of supply of such a local authority is not only the democratic right but also the duty of that authority.

Here I would like to refer to the report of the Rights of Supply Sub-Committee submittted to the Association at its Technical Meeting in Potchefstroom in 1970, which clearly sums up the present situation:

> " Events during the past year indicate that the construction of any municipal generating station in the future is extremely unlikely and that

sal wees en dat EVKOM uiteindelik die enigste owerheid in die land sal wees wat elektrisiteit sal opwek. Dit sal in ooreenstemming wees met die aanbevelings van die Borckenhagen-kommissie, die verklarings van die verantwoordelike Kabinetsministers en die toespraak van die Voorsitter van EVKOM by die Konvensie wat gedurende Mei 1963 te Margate gehou is, asook van EVKOM se Onder-Hoofbestuurder in Umtali in Junie 1969.

Al hierdie owerhede is ook die mening toegedaan dat die reg om elektrisiteit aan verbruikers in sy gebied te verskaf, aan die plaaslike owerheid oorgelaat behoort te word.

Die Uitvoerende Raad is van mening dat dit slegs realisties sal wees om die situasie te aanvaar soos dit is en om sy toekomstige pogings daarop toe te spits om te verseker dat enige voorgestelde wysiging van die Elektrisiteitswet, EVKOM se toekomstige tariewe en die regte van Munisipaliteite om elektrisiteit by kleinmaat aan sy verbruikers te verkoop, so voordelig as moontlik is."

Voortgesette samewerking tussen hierdie twee belangrike voorsiening-owerhede wie se funksies aanvullend en nie teenstrydig met mekaar behoort te wees nie, in noodsaaklik om in die toekomstige behoeftes vir elektrisiteit in Suid-Afrika te kan voorsien en ek vertrou dat ons nou maar afstand sal kan doen van die „skaduwee van EVKOM wat op ons neerdaal" waarna in die verlede by hierdie Konvensie verwys is.

4. Opknapping vir Doeltreffendheid :

Ons kan nou kortliks voortgaan om die huidige doeltreffendheid van munisipale elektrisiteitsvoorsiening in oënskou te neem, 'n saak wat 'n dekade gelede reeds deur 'n vorige President in sy rede na verwys is.

Soos reeds vermeld word nou aanvaar dat kragopwekking en die verspreiding daarvan oor 'n nasionale transmissie-stelsel die verantwoordelikheid van EVKOM sal wees. Die kleinmaat verspreiding van elektrisiteit vanaf hierdie kragsentrales en transmissiestelsel is die verantwoordelikheid van munisipale elektrisiteitsondernemings binne hulle lisensieërde voorsieningsgebiede.

Alhoewel daar tot dusver geen standaard wyse bestaan om die doeltreffendheid van munisipale elektrisiteitsondernemings op vergelykbare grondslag te bepaal nie kan die werkverrigting en praktyk van Springs se munisipale elektrisiteitsonderneming met 'n spitslas van oor die 60 megawatt heelwaarskynlik as tipiese voorbeeld geneem word van die toestand wat in die algemeen heers in soortgelyke ondernemings waar laasgenoemde elektrisiteit in grootmaat van EVKOM ontvang vir verdere kleinmaat verspreiding.

Dit word miskien nie allerweë besef dat 'n munisipale elektrisiteitsonderneming wie elektrisiteit in groot-

ESCOM will eventually become the sole generation authority in the Republic. This would be in accordance with the recommendations of the Borckenhagen Commission, the statements of the responsible Ministers of State and the address given by the Chairman of ESCOM to the Convention held in Margate in May 1963, and also by ESCOM's Deputy-General Manager in Umtali in June 1969.

All of these authorities also considered that as far as possible the right to distribute electricity to consumers in their areas should be left to the local authorities.

The Executive is of the opinion that it would be realistic to accept this situation and to concentrate endeavours towards ensuring that any contemplated alterations to the Electricity Act, the future tariffs of ESCOM, and the rights of Municipalities in retailing to their citizens are as advantageous as possible."

Continued co-operation between these two important supply authorities, the functions of which should be complementary and not contradictory to one another, is essential to meet the future needs for electricity in South Africa, and I trust that we will now be able to dispose of the so called "shadow of ESCOM that descends upon us" referred to in the past at these Conventions.

4. Trimming for Efficiency :

Having arrived at this point in this address, we can now briefly turn our thoughts to the present day efficiency of municipal electricity supply, a matter already referred to a decade ago by a past President in his address.

As already mentioned, we now accept that the generation of electricity and its distribution over a national transmission system is the responsibility of ESCOM. The retail distribution of electricity from this transmission system and generating stations is the responsibility of municipal electricity undertakings within their licensed areas of supply.

Although there is as yet no standard means of assessing the overall efficiency of an electricity undertaking on a common and comparable basis the performance and practice of the Springs electricity undertaking, with a maximum demand of some 60 megawatt, can most probably be taken as fairly typical of the situation in general, in similar undertakings where these receive their supply in bulk from ESCOM for further retail distribution.

It is perhaps not generally realised that a municipal electricity undertaking receiving its electricity in

maat ontvang, slegs 'n klein gedeelte van die totale bedryfskoste beheer en dus regstreeks kan beïnvloed soos aangetoon in fig. 1(a) en (b) van die bylae.

Die uitgawe waarop 'n direkte kontrole uitgeoefen kan word beloop gemiddeld slegs 17.4% van die totale bedryfskoste, die balans is vir die aankoop van elektrisiteit in grootmaat vanaf EVKOM (64%) en leningskoste (18.6%). Soos aangetoon in fig. 1(b) van die bylae, is laasgenoemde tans onderhewig aan sterk inflasionêre druk en gepaardgaande stygende rentekoerse.

Andag moet dus toegespits word om die bedryfsdoeltreffendheid te verbeter en alhoewel die gedeelte van die bedryfskoste wat wel beinvloed kan word gering is, is dit nogtans die enigste direkte koste wat deur munisipale elektrisiteitsonderneming beheer kan word. Die werkverrigting van Springs se elektrisiteitsonderneming in die opsig word aangetoon in fig. 2 van die bylae.

Dit toon dat die tempo waarteen distribusiekoste gestyg het heelwat laer is as die styging in totale uitgawes nieteenstaande 'n verhoging in koste van materiaal en arbeid oor die afgelope dekade. Hierdie syfers toon dus 'n definitiewe toename in bedryfsdoeltreffendheid aan.

Dieselfde geld vir administrasiekoste wat ook regstreeks deur die elektrisiteitsonderneming beheer word, maar die departementele bydrae wat gemaak moet word om kosteberekenings, begrotings, meterlesings en die uitstuur en invordering van rekenings te behartig, toon 'n styging wat in direkte verhouding is met die toename in totale uitgawe nieteenstaande verhoogde meganisasie met kompers ens. Die vraag ontstaan dus of hierdie bydrae realisties bereken word indien dit opgeweeg word teenoor die werklike uitgawe. Moontlik kan ons Tesouriers 'n bevredigende antwoord hierop verskaf en ek sou graag wil sien dat hierdie aangeleentheid deeglik ondersoek word aangesien hierdie uitgawe nou 30% uitmaak van daardie gedeelte van die bedryfskoste wat regstreeks beheer kan word. 'n Herwaardering mag dus nodig wees vir 'n verdere bydrae vir die verbetering in werksverrigting van munisipale elektrisiteitsondernemings.

Wat van produktiwiteit en gevolglike bydrae vir 'n verlaging in bedryfskoste? Dit word aangetoon in fig. 3 van die bylae wat aandui dat nieteenstaande die handhawing van 'n hoë groeikoers van die onderneming soos aangetoon deur die toename in kilowattuur (eenhede) wat verkoop word en kapitaal besteding wat nodig is, het mannekrag 'n geringe vergelykende verhoging getoon. Die rede hiervoor is dat daar gepoog word om met personeel geëweredig aan 'n doeltreffende organisasie die onderneming te bestuur. 'n Ander belangrike faktor wat bedryfskoste wesenlik beïnvloed en natuurlik ook die leningskoste op nuwe uitrusting wat geinstalleer word, is die verlaging van ingenieurskoste deur verhoogde standaardisasie op

bulk, can only influence a fairly small proportion of its total operating costs as shown in fig. 1(a) and (b) of the addendum.

The directly controlled costs average only about 17.4% of the total, the remainder being the purchase of electricity in bulk from ESCOM (64%) and capital charges (18.6%). The latter at present being influenced substantially by strong inflationary pressure and increased interest rates as shown in fig. 1(b).

Attention must therefore be given to improving operating efficiency, because although the proportion of operating costs which can be influenced is relatively small, this is still the only means by which a municipal electricity undertaking can control the total figure. The performance of the Springs electricity undertaking in this respect is shown in fig. 2 of the addendum.

This shows that the rate of increase in distribution costs has been kept substantially lower than the increase in total expenditure, despite increased costs of materials and labour over the past decade. These figures therefore represent a real improvement in operating efficiency.

This also applies to administration costs which are directly controlled by the municipal electricity undertaking, but the departmental contribution towards costing, meter reading and accounting however shows a rate of increase which is in direct proportion to the increase in total expenditure despite increased mechanisation with computers, etc. The question therefore arises whether the basis of calculation for this contribution is realistic in relation to the actual expenditure involved. A revaluation may be necessary so that a further contribution towards increased operating efficiency in municipal electricity undertakings can be achieved. Possibly our Treasurers can provide us with a satisfactory answer and I would suggest that this aspect be investigated seeing that this cost is now about 30% of the total proportion of the operating costs which can be controlled.

What about productivity and its contribution to a reduction in operating costs? This is shown in figure 3 of the addendum which indicates that despite the expansion of the municipal electricity undertaking shown by the increase in units sold and capital expenditure involved, manpower has not increased as rapidly as the aim has been to work with staff commensurate with an efficient organisation. Another factor affecting operating costs and naturally loan charges on new equipment being installed, is the lowering of engineering costs by increased standardisation of materials and new techniques on equipment such as transformers, switchgear, plastic insulated cables, aluminium replacing copper conductor for

JAARLIKSE PROPORSIONELE BEDRYFSKOSTE

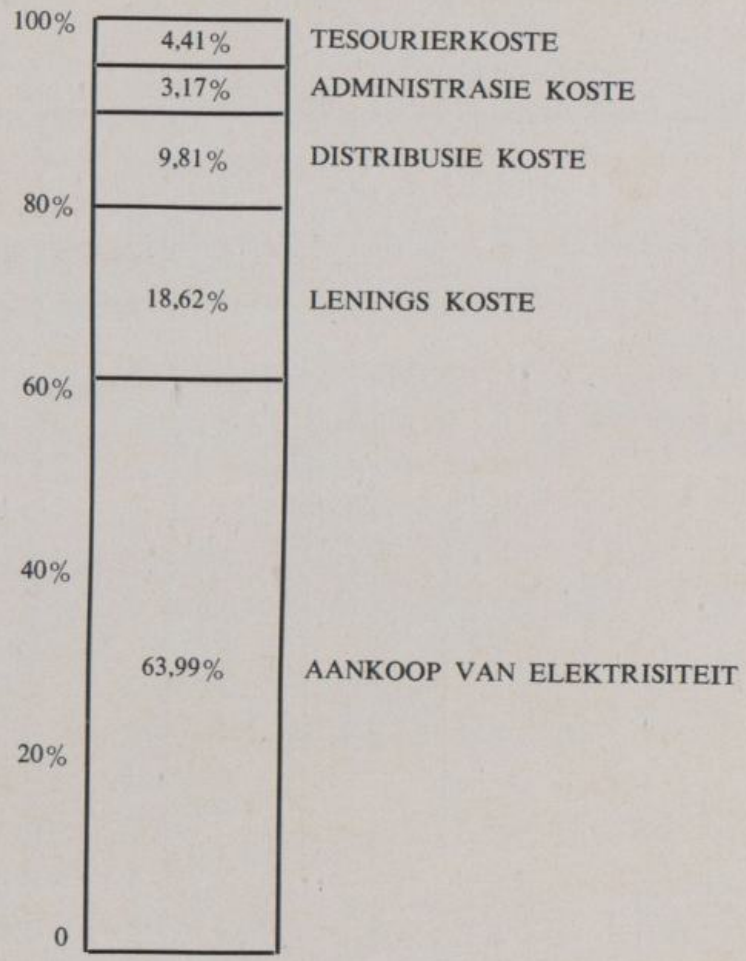


FIG. 1 (A)

VIR DIE PERIODE 1961/71
FOR THE PERIOD 1961/71

ANNUAL PROPORTIONATE OPERATING COSTS

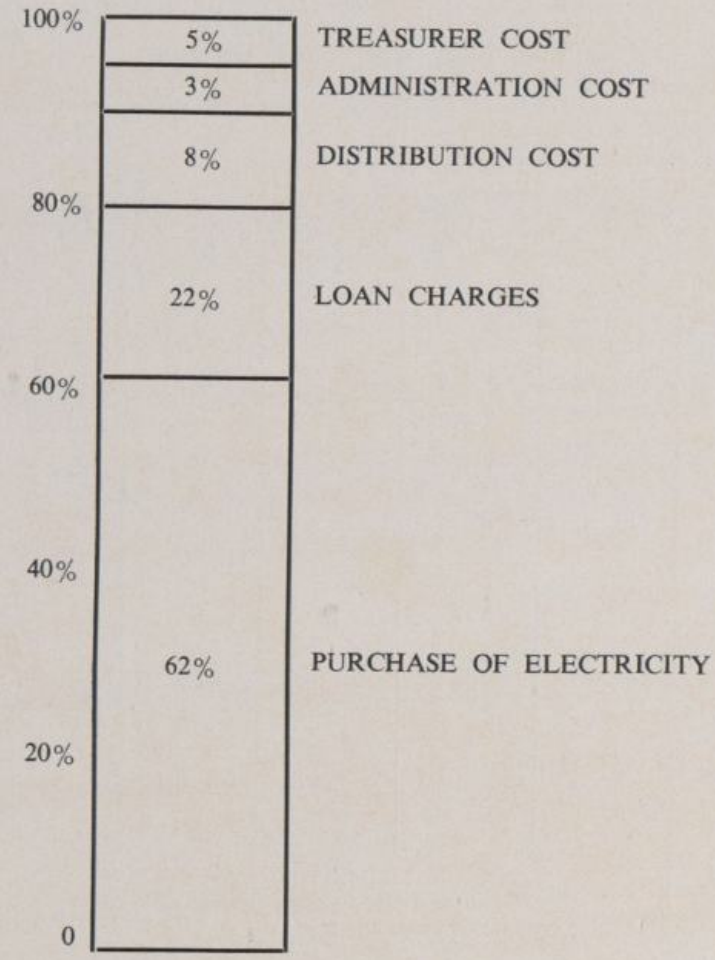
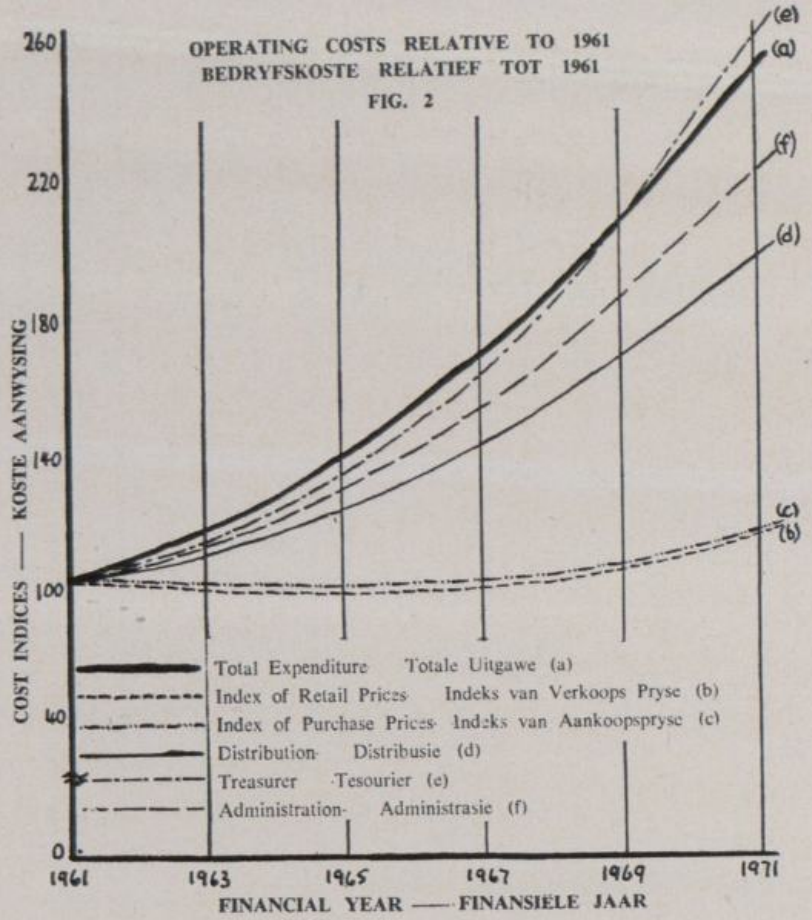


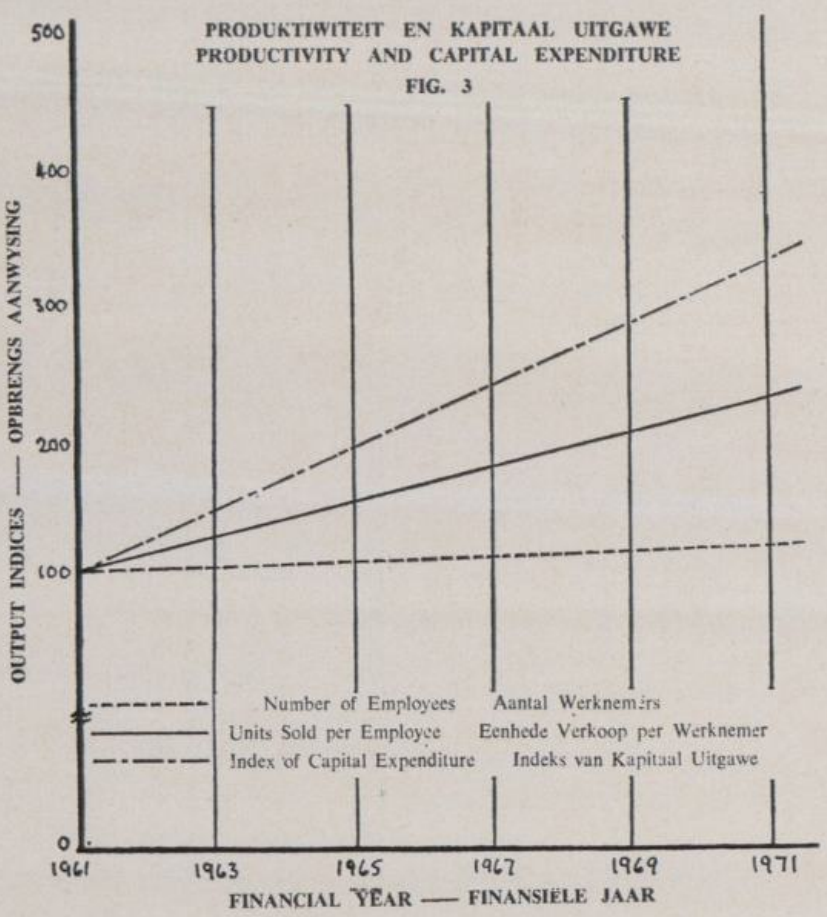
FIG. 1 (B)

VIR DIE JAAR 1971/72
FOR THE YEAR 1971/72

OPERATING COSTS RELATIVE TO 1961
BEDRYFSKOSTE RELATIEF TOT 1961
FIG. 2



PRODUKTIWITEIT EN KAPITAAL UITGAWE
PRODUCTIVITY AND CAPITAL EXPENDITURE
FIG. 3



materiale en aanwending van nuwe tegnieke vir uitrusting soos transformators, skakeltuig, plasties geisoleerde kabels, aluminium in plaas van koper as geleier in ondergrondse en bogrondse verspreiding, die aanwending van beskermende veelvuldige aarding (p.m.e.) met konsentriese nul-geleier kabels en ander verwante nuwe aanwendings.

Ek dink ons behoort hier die Buro van Standaarde geluk te wens en te ondersteun in hulle voorgesette pogings met verhoogde standaardisasie want slegs deur hierdie wyse kan ons ingenieurskoste verder verlaag.

Verdere moontlike bydraes vir 'n verbetering in doeltreffendheid sluit in die aanwending van afstandskakeling- en meting, outomatisasie, en die gebruik van nuwe en gevorderde ontwerpe vir skakeltuig van die minimum-olie of vakuum tipes met gepaardgaande laer instandhoudingskoste.

Nieteenstaande die feit dat 'n munisipale elektrisiteitsonderneming dus slegs 'n klein gedeelte van die totale bedryfskoste regstreeks kan beinvloed word die werkverrigting steeds verbeter om aan te pas by die toenemende eise wat aan hierdie nywerheid gestel word.

5. Moderne Bestuur :

Die voorafgaande ontleding van die werksverrigting van 'n munisipale elektrisiteitsonderneming toon dus duidelik dat daar oor de afgelope dekade 'n werklike poging was om die bedryfs-doeltreffendheid te verhoog. Die belangrike vraag egter is of hierdie doeltreffendheid gehandhaaf of selfs verbeter sal kan word gedurende die volgende dekades in die lig van steeds stygende materiaal en arbeidskoste asook binne die raamwerk van die huidige plaaslike regeringstelsel in Suid-Afrika.

Met die handhawing van 'n hoë bedryfsdoeltreffendheid is 'n voortgesette toename in produktiwiteit die enigste manier waardeur dit verkry sal kan word en hier is ek van mening dat baie bereik kan word met die hulp van moderne bestuurstegnieke, organisasie en metodes. Dit is myns insiens die een onderwerp waaraan daar in 'n munisipale organisasie nie genoeg aandag verleen word wat dit regverdig nie. Die Minister van Finansies het in 1970 die volgende opmerking gemaak :

„ Dit is nie vir die Regering alleen om die mannekragvraagstuk op te los nie. Ek wil in alle erns die vraag stel of werkgewers nie deur doeltreffender organisasie en metodes 'n groter bydrae kan maak tot die bereiking van groter produktiwiteit nie, en of ons almal, selde watter werk ons doen, nie die welsyn van ons land aansienlik kan help vermeerder deur 'n bietjie harder en 'n bietjie langer te werk nie."

Nou is dit egter ook so dat in die verlede heelwat probleme ondervind is met onsuksesvolle implementering en toepassing van die meeste doeltreffendheidsondersoeke in munisipale departemente met die gevolg dat Ingenieurs geneig is om baie skepties te staan

cables and overhead lines, the adoption of protective multiple earthing (p.m.e.) with concentric neutral cables and other applications.

I think here we should congratulate and support the South African Bureau of Standards in their continued efforts for increased standardisation as only by these means can we achieve a further lowering of engineering costs.

Further possible contributions towards improved efficiency include the application of ripple control, automatic supervision, telemetering and the introduction of new designs of switchgear, either of the small-oil volume type or incorporating vacuum switching which will require less scheduled maintenance.

Although the municipal electricity undertaking can therefore only influence a small proportion of its total operating costs the operating efficiency is steadily being improved to meet the increased demands made upon this industry.

5. Modern Management :

The foregoing analysis of the operating efficiency of a municipal electricity undertaking therefore clearly indicates that during the past decade there has been a real attempt to increase efficiency. The important question however is whether this can be maintained or even improved during the following decades in the face of ever increasing costs, labour shortages and the present local government system in South Africa.

In maintaining a high operating efficiency a continued increase in productivity is the only real means by which this can be achieved and here I think that much can be done with the aid of modern management techniques, organisation and methods. This is, in my opinion, the one subject that has not received the attention it deserves in a municipal organisation. The Minister of Finance made the following remark in 1970 :

Unfortunately due to the many problems experienced with the unsuccessful implementation and application of most efficiency investigations in municipal departments in the past, the result has been that Engineers are inclined to stand very sceptical towards

teenoor die werklike voordele wat uit sodanige ondersoeke behoort te vloei.

Dit was ongelukkig ook my eie ondervinding maar met die korrekte opleiding vir die suksesvolle implementering daarvan bestaan daar egter by my nie die minste twyfel nie dat die voordele wat verkry kan word uit moderne bestuurstegnieke 'n verreikende invloed kan hê op verhoogde produktiwiteit asook verhoogde doeltreffendheid in munisipale departemente.

Tydens die huidige Konvensie sal ons die voorreg geniet om na referate oor hierdie kontensieuse onderwerp te kan luister en samesprekings daaroor te voer en ek vertrou dat dit sal bydra om die voorbehoude uit die weg to ruim wat by Ingenieurs in die verband bestaan.

Ek sou egter graag ook van die geleentheid wil gebruik maak om 'n beroep te doen op bestuursdepartemente om met doeltreffendheids-ondersoeke in Ingenieursdepartemente, die praktiese aspekte vir die toepassing daarvan in gedagte te hou. Dit dien geen doel om lywige verslae met suiwer teoretiese oplossings aan die hand te doen vir verhoogde produktiwiteit en doeltreffendheid en dit dan aan die Ingenieur oor te laat om die praktiese tekortkominge vir die implementering daarvan uit te sorteer nie. Die gevolg hiervan is dat die voordele wat hieruit mag voortspruit nooit werklik verwesenlik sal word nie en soos die naam immers ook aandui is hulle diensdepartemente en nie bloot beheerdepartemente nie. Ek vertrou dat hierdie beroep in die gees waarin dit bedoel is aanvaar sal word en nie as ongeregverdigde kritiek van O. & M. of bestuurdienste beskou sal word nie.

Daar is ook onlangs tydens die Kongres van Stadsklerke 'n pleidooi gelewer vir 'n terugkeer na 'n sesdaagse werksweek maar tensy dit gepaard gaan met verhoogde produksie sal dit geen merkbare verskil op werksuitvoering of arbeidsbesparing meebring nie.

Ek sou net graag 'n opmerking wil maak oor hierdie woord „produktiwiteit" waarna so dikwels en so maklik die afgelope aantal jare verwys word. Wat beteken die woord in werklikheid? Dit beteken nie eenvoudig „harder" of „langer" werk nie maar eintlik beteken dit „knapper" werk, en dit is die funksie van „bestuur" en nie slegs die „werknemer" om die doel te bereik. Ons moet die toesighouer en die werker die nodige toerusting gee en die tegnieke leer wat hom in staat sal stel om doeltreffender werk te kan verrig en dit is waar moderne bestuur 'n al hoe belangriker bydrae in toekoms sal moet lewer indien ons die beste gebruik van ons beskikbare mannekrag wil maak.

Dit is ook die moeite werd om te onthou „ dat bestuur slegs dit **verdien** wat dit **sien** " en dit beteken dat dit wat ons persoonlike aandag en tyd geniet presies is wat ons ondergeskiktes aan ons sal teruggee. Met ander woorde—„ Bestuur maai wat dit saai " is net so waar in hierdie geval.

the real values to be gained from such investigations.

This has unfortunately also been my own experience but with the correct training for the successful implementation thereof there is no doubt in my mind that the advantages to be gained from modern management techniques can have a far reaching effect on increased productivity and efficiency in municipal departments.

At this Convention we will be fortunate to have papers presented to us on this contentious subject and I trust that this will help to overcome the reservations Engineers may have in this respect.

I would however like to take the opportunity of requesting management departments when undertaking efficiency investigations in engineering departments to keep the practical aspects for the application thereof in mind. It serves no purpose to present voluminous reports containing purely theoretical solutions for increased productivity and efficiency and it is then left to the Engineer to sort out the practical shortcomings for the implementation thereof. The result is that the advantages claimed will never really be realised and as the name also implies they are service departments and not solely control departments. I trust that these remarks will be accepted in the right spirit and not as unfair criticism of O. & M. or management services.

At the recent congress of Town Clerks a plea was made for a return to a six day working week but unless this is accompanied by an increase in production, this will have no noticeable effect on working performance or result in labour saving.

I would just like to make a remark on this word " productivity " so often and easily referred to over the past few years. What does the word really mean? It does not merely mean to work " harder " or " longer," in fact it means to work " smarter " and it is up to " management " to achieve this and not only the " employee." We must provide the supervisor and the worker with the tools and teach him the techniques that will enable him to perform his task more efficiently and that is where modern management will have to play a much more important part in future, if the best possible use is to be made of our available manpower.

It is also worth remembering " that management **gets** what it **inspects** " which means that whatever receives our personal attention and time is exactly what our subordinates will give us back. In other words " Management reaps what it sows " is equally true in this instance.

6. Plaaslike Regering in Suid-Afrika :

Ek dink dit is ook nodig om kortliks die plaaslike regeringstelsel in oënskou te neem soos ons dit ken in Suid-Afrika. Dit is immers hierdie hoër gesag wat die beleid bepaal wat munisipale aangeleenthede aanbetref en as sulks dus 'n belangrike rol sal speel in die toekoms van munisipale elektrisiteitsvoorsiening in Suid-Afrika.

Heelwat kritiek is in die jongste tyd teenoor die plaaslike regeringstelsel in ons land uitgespreek. Daar word gesê dat sekere dinge plaasvind wat 'n stremmende uitwerking het op die vinnige en doeltreffende uitvoering van munisipale projekte. Onder andere word beweer dat die beheer stelselmatig uit die hande van plaaslike owerhede geneem word, dat plaaslike finansiële beleid nie meer 'n suiwer plaaslike eengeleentheid is nie, dat die salarisse wat hulle meen hulle senior amptenare regverdig, nie meer deur hulle bepaal word nie.

Daar word in werklikheid gesê dat plaaslike owerhede niks anders meer is as die mondstuk van die hiërargie wat die gesag oorgeneem het om belangrike besluite te neem oor suiwer plaaslike aangeleenthede.

Dit is 'n feit dat plaaslike besture 'n opdraende stryd voer om al hulle verpligtinge na te kom. Kapitaal-besteding moet drasties besnoei word en die mannekrag wat behoorlik opgelei is om projekte uit te voer word deur die privaat sektor geabsorbeer waar hulle vir hulle dienste beter vergoed word. Inmenging met salaris-strukture kan 'n nadelige invloed hê op die kwaliteit van applikante wat aansoek doen vir senior betrekkinge in munisipaliteite met die gevolg dat wanneer die teenswoordige toegewyde amptenare wat nog in diens van plaaslike besture staan, die dag nie meer daar is nie, daar maar weinig van dieselfe gehalte sal oorbly om hulle plekke te vul.

Dit kan seker nie betwis word dat sekere van bovermelde dinge 'n stremmende uitwerking kan hê maar terselfdertyd moet die vraag gestel word of die probleme voortspruitend uit sogenaamde inmenging op die regte vlak bespreek en uitgemaak word? Hier wil ek graag die opmerking van mnr. R. S. Ferreira, voormalige L.U.K. belas met Plaaslike Bestuursaangeleenthede in die Transvaal, aanhaal wat gemaak is tydens die Kongres van die T.M.V. gehou in Potchefstroom gedurende 1969 :

„ Daar is een aspek wat voortspruit uit provinsiale beheer waarna ek wil verwys en dit is dat sodanige beheer deur sommige stadsrade en amptenare vertolk word as inmenging in die huishoudelike sake van stadsrade.

Ek weet dat hierdie vertolking nie nuut is nie. Dit is jare gelede al met tussenposes gemaak. Dit word telkemale sporadies herhaal. Onlangs nog het daar 'n voorlegging voor die T.M.V. gedien waarin dieselfde bewering van immenging gemaak is.

6. Local Government in South Africa :

I think it is also necessary to briefly reflect upon the present local government system in South Africa, who after all are the higher authorities who determine the policy governing municipal affairs and as such will be playing an important part in the future of municipal electricity supply in South Africa.

A certain amount of criticism has lately been levelled at the local government system in this country. It is said that certain things are taking place which have the effect of hampering the speedy and economic execution of works by local authorities. It is said that control is being taken out of the hands of local authorities, that their finances are no longer its own affair, that the salaries it feels its senior officials are worth are no longer decided by them.

In fact it is said that these civic bodies do no more than pay lip-service to the hierarchy that has taken over the powers to make important decisions affecting the domestic affairs of municipalities.

It is a fact that local authorities are battling against severe odds to keep things going in their cities and towns. Spending powers must be gravely curtailed and the men suitably qualified to carry out vital works are being absorbed by the private sector where they are adequately rewarded. Interference in salary grades can have an adverse effect on the quality of the men applying for senior positions in municipal service, the result of which may be that when the teams of dedicated men still in the service have gone there will be few of their calibre left to take their place.

That some of the above matters can have a detrimental effect can possibly not be disputed but at the same time the question must be asked whether the problems associated with so called interference have been discussed and resolved at the right level? Here I wish to quote the following remarks made by Mr. R. S. Ferreira, former M.E.C., responsible for Local Government matters in the Transvaal, during the T.M.A. Congress held in Potchefstroom in September, 1969 :

Ek het die voorlegging gelees en nadat ek dit gelees het, het ek gewonder wat die beskuldiging nou werklik is, want dit het nie na spesifieke voorbeelde van sogenaamde inmenging verwys nie. Dit hinder my dat mense die beskuldigings op 'n distansie maak. Almal weet waar my kantoor en die kantoor van my Direkteur is, want daar word daagliks by ons aangeklop vir hulp, raad en advies, wat ons verwelkom en waarmee ons uit ons pad gaan om te help. Niemand het blykbaar nog die vrymoedigheid gehad om met

ons oor gevalle van beweerde inmenging te kom praat nie.

Ek sal graag wil weet waaroor dit gaan en as daar wel gevalle van onregmatige inmenging plaasgevind het, sal ek nie huiwer om dit reg te stel nie. My departement is nie net 'n beheerdepartement nie, maar ook 'n diensdepartement en daarom behoort daar in hierdie verband geen misverstand tussen plaaslike besture en my departement te wees nie."

Dit wil dus voorkom dat daar 'n gebrek aan oorlegpleging bestaan tussen plaaslike en provinsiale owerhede waar probleme van hierdie aard ondervind word. Dit is egter ook 'n feit dat plaaslike regering in Suid-Afrika 'n aanpassing sal moet maak on tred te hou met die eise van die toekoms.

Hier is dit miskien van belang om ook die opmerking van die voormalige Administrateur van Natal, Sy Edele mnr. T. J. A. Gerdener, aan te haal, tydens die Kongres van die N.M.V. in Scottburgh gedurende 1969 :

It would therefore appear that there is a lack of consultation between local and provincial authorities where problems of this nature are experienced. It is however also equally true that local government in South Africa needs adjustment to meet the demands of the future.

Here I quote the former Administrator of Natal, The Honourable Mr. T. J. A. Gerdener, who opened the annual conference of the N.M.A. in Scottburgh in 1969 :

" I have taken the trouble to read one or two of the reports which emanated from the South African local government experts who attended the congress of the International Union of Local Authorities held in Vienna in June of this year.

From the replies given by the 33 countries which attended the congress it is abundantly clear that local government throughout the Western World is becoming less and less a purely local affair. The tendency which is observable in practically every democracy in the world, is that local government has to expand and contract activities to the dictates of the national economic position, to the dictates of certain national planning concepts and to the dictates of the national socio-political pattern.

It is most interesting to note from the reports also that increased financial control by higher authorities is a world wide phenomenon. Everywhere local authorities are being called upon to provide more and better services without always being provided by the additional sources of taxation, and aften without being given the scope to operate under conditions which are conductive to the growth of either their autonomy or their revenue.

It is equally clear too that all over the world local authorities are experiencing that the less independent they are on grants and subventions from higher authorities, the greater is their freedom and the more dependent they are on help, the stronger are the dictates from the higher tiers of government. Unmistakably, the answers to the questionnaires disclosed also that there is widespread uneasiness on local government level in most countries, and what is more, that the position is deteriorating.

This is often attributable to not only the paucity of taxation sources but also to the fact that such taxes as are available are nearly always too in-elastic for local authorities' needs."

Plaaslike Regering sal dus ook in Suid-Afrika 'n aanpassing moet maak by 'n steeds veranderende patroon en wat munisipale elektrisiteitsondernemings betref moet besef word dat die diens wat gelewer word uiteindelik net so goed kan wees soos die beleid wat dit beheer. Ek wil dus die vertroue uitspreek dat die plaaslike regering en die hoër vlak van gesag daarin sal slaag om die nodige aanpassings te maak om te voorsien in die toekomstige behoeftes van die moderne samelewing. Dit is noodsaaklik om doeltreffende munisipale dienste te kan verseker.

Local Government in South Africa will therefore also need to adjust itself to an everchanging pattern and as far as municipal electricity supply is concerned it must be realised that a service sold to the public can in the end only be as good as the policy that governs it. I therefore express confidence that local government and the higher tiers of authority will succeed in adjusting itself to meet the future needs of modern society. This is essential to ensure efficient municipal services.

7. Die toekomstige rol van die V.M.E.O.

Dit is ook baie duidelik dat die V.M.E.O. aanpassings sal moet maak en homself al hoe meer sal moet laat geld op die gebied van elektrisiteitsvoorsiening in Suid-Afrika.

Volgens my waarneming as lid van die V.M.E.O. en ook as lid op die Uitvoerende Raad oor die afge-

7. The Future Role of the A.M.E.U.:

It is quite clear that the A.M.E.U. will have to make adjustments and bring its influence to bear in a greater measure as far as the supply of electricity in South Africa is concerned.

From my observations as a member of the A.M.E.U. and also as a member of the Executive

lope aantal jare tree die V.M.E.O. hoofsaaklik op as tussenganger of raadgewer oor sake rakende nasionale en munisipale elektrisiteitsvoorsiening. Is dit nie miskien nodig dat die V.M.E.O. sy beleid wysig en homself meer positief sal laat geld nie slegs op nasionale vlak nie maar ook op internasionale vlak?

Dit is my eerlike mening dat die oorwegende passiewe rol wat die V.M.E.O. tot dusver ingeneem het gewysig behoort te word en dat die V.M.E.O. sy regmatige plek moet inneem op nasionale sowel as internasionale vlak en veral ook wat beherende liggame rakende elektrisiteitsvoorsiening in Suid-Afrika betref.

Hiermee word geensins beweer dat die V.M.E.O. nie tot dusver sy funksie doeltreffend vervul het nie. Inteendeel, die V.M.E.O. het hom goed van sy taak gekwyt en die belange van munisipale elektrisiteitsvoorsiening steeds tot die beste van sy vermoë beskerm en bevorder, maar dit is altyd nodig dat aanpassing gemaak word by steeds veranderende omstandighede, wat nie net vir die V.M.E.O. nie maar ook vir ander munisipale organisasies sal geld.

Dit is egter bemoedigend om te kan meld dat die Uitvoerende Raad van die V.M.O.E. reeds die belangrikheid van internasionale deelname op die gebied van elektrisiteitsvoorsiening besef het en vir die eerste keer verteenwoordig was in die Suid-Afrikaanse afvaardiging tydens die onlangse vergadering in Mei vanjaar van die I.E.K. in Brussels.

Die vraag ontstaan verder of dit enige doel dien omslegs elke tweede jaar 'n konvensie te belê in die lig van die steeds toenemende eise wat aan hierdie nywerheid in Suid-Afrika gestel word. In my opinie is dit nodig om belangrike besluite en beleid-sake rakende munisipale elektrisiteitsvoorsiening spoedig tot finaliteit deur te voer indien dit enigsins effektief moet wees wat beswaarlik moontlik is met 'n onderbreking in kontinuïteit oor 'n tydperk van twee jaar.

Dit blyk dus nodig te wees dat die onderskeie munisipale verenigings hierdie aangeleentheid weer in oënskou neem en dat dit in die regte perspektief geplaas word. Heelwaarskynlik sal gevind word dat die faktore wat in die verlede aanleiding gegee het tot die hou van kongresse elke tweede jaar nou wesenlik verander het.

8. Slot :

Die afleiding kan dus gemaak word dat die werkverrigting van munisipale elektrisiteitsondernemings in Suid-Afrika steeds verbeter word om die toenemende eise die hoof te bied maar terselfdertyd moet toegegee word dat aangesien 'n derde van die totale elektrisiteits behoeftes van die land deur munisipaliteite versprei word, dit 'n ontsaglike elektriese voorsieningsnywerheid verteenwoordig waarvoor plaaslike regering en owerhede die verantwoordelikheid aanvaar het.

Tegniese ontwikkeling in hierdie ruimte-eeu is

Council over the past few years, the A.M.E.U. acts mainly as mediator or advisor on matters relating to national and municipal electricity supply. Has the time not arrived for the A.M.E.U. to change its policy and bring its influence to bear more positively on the national as well as the international level?

It is my honest opinion that the predominantly passive role the A.M.E.U. has so far adopted needs a change and that the A.M.E.U. took its rightful place in the national as well as the international level and especially, as far as governing bodies relating to the supply of electricity in South Africa are concerned.

Hereby it is by no means suggested that the A.M.E.U. has so far not fulfilled its function efficiently. On the contrary, the A.M.E.U. has acquitted itself admirably of its responsibilities and has at all times protected and promoted the interests of municipal electricity supply to the best of its abilities, but it is however always necessary to make the necessary adjustments to meet the constant changes that take place, which does not only apply to the A.M.E.U. but to all other similar municipal organisations as well.

It is however gratifying to be able to mention that the Executive of the A.M.E.U. has already realised the importance of international participation in matters concerning electricity supply and was represented for the first time on the South African delegation which attended the last meeting of the I.E.C. in Brussels in May of this year.

The question also arises whether any real purpose is served by only holding Conventions every second year in the face of ever increasing demands made upon the electricity supply industry in South Africa. In my opinion it is necessary that important decisions and policy matters relating to municipal electricity supply are brought to finality as expediently as possible if they are to be really effective which has proved to be virtually impossible with a break in continuity over a period of two years.

It would therefore seem necessary that the various municipal associations reconsider this question and that it be brought into the right perspective. Most probably it will be found that the factors which have contributed towards holding biennial conventions in the past may hove changed materially over the last few years.

8. Conclusion :

It can therefore be concluded that the performance of municipal electricity undertakings in South Africa is constantly being improved to meet the ever increasing demands, but at the same time it must also be conceded that as a third of the country's electricity needs is being distributed by these undertakings, this represents a formidable electricity supply industry for which local government and authorities have accepted the responsibility.

Technical developments in this space age are

van so 'n aard dat slegs die spesialiste die toekomstige ingenieurswese sal kan bedien, insluitende die munisipale ingenieurswese. Plaaslike besture sal dus hierdie verantwoordelikheid moet besef en voorsiening daarvoor moet maak dat die spesialiste beskikbaar sal wees vir munisipale dienste, en in besonder vir die handels-ondernemings wat 'n al hoe groter bydrae in toekoms sal moet lewer om plaaslike besture in staat te stel om hulle veelvuldige verantwoordelikhede en verpligtinge na te kom.

Dit is egter 'n uitdaging aan ons, die Ingenieurs van vandag, om 'n daadwerklike poging aan te wend om voortgesette doeltreffende munisipale dienste te verseker deur steeds te streef na maksimum benutting van ons beskikbare mannekrag en materiële reserwes.

In afsluiting, Dames en Here, met hierdie paar persoonlike gedagtes wat uitgespreek is in hierdie rede, wil ek die hoop uitspreek dat daarin geslag is om aan te toon dat die donker toekoms wat soms vir munisipale elektrisiteitsvoorsiening en munisipale dienste as geheel in Suid-Afrika voorgehou word in werklikheid glad nie so donker is nie. Ons as munisipale elektriese ingenieurs is immers die mense wat „lig" moet verskaf alhoewel ons ook soms in die „donker" rondtas. Indien plaaslike regering in Suid-Afrika, en daar is geen rede om die teendeel te vermoed nie, bereid is om die nodige aanpassings te maak om in die behoeftes van die moderne samelewing in die volgende dekades te voorsien, dan sal munisipale elektrisiteitsondernemings ook in 'n posisie wees om die eise van die toekoms die hoof te bied.

Mag hierdie voorspelling bewaarheid word wanneer hierdie Konvensie weereens aan die einde van die huidige dekade byeen sal kom en 'n terugblik gewerp word oor die afgelope tien jaar se prestasies.

such that only the specialists will be able to man the machines of the future in all fields of engineering, including municipal engineering. Local authorities must therefore accept these facts and will have to make provision for the specialists to man these machines, especially for their trading undertakings who will be called upon to make even greater contributions in future so that local authorities can meet their many responsibilities and commitments.

However, it is also up to us, the Engineers of today to make an all out effort to maintain an efficient service by striving for maximum utilisation of our available manpower and material reserves.

In conclusion, Ladies and Gentlemen, with these few personal remarks expressed in this address, I trust I have succeeded in showing that the dark future sometimes forecast for municipal electricity supply and municipal services in general in South Africa is not really so dark. After all, we as municipal electrical engineers are the people who must provide "light" although we often have to fiddle around in the "dark." If local government in this country is prepared to adjust itself to the needs of modern society in the coming decades, and there is no reason to suspect the contrary, then municipal electricity undertakings will also be in a position to meet the demands of the future.

May this forecast be proven correct when this Convention meets once again at the end of this decade and a reflecting eye is cast over the achievements of the past ten years.

Proposing a vote of thanks to the President for his address, Mr. A. C. T. Frantz (Cape Town) referred to the importance of undertakings being run as efficiently as possible and to the necessity of better understanding by all concerned of the importance of the work of the A.M.E.U.

In the course of his address seconding the vote of thanks, Mr. G. C. Theron (Vanderbijlpark) said :

Toe hy 'n mosie van dank aan die President vir sy rede voorstel, verwys mnr. A. C. T. Frantz (Kaapstad) na die belangrikheid daarvan dat ondernemings so doeltreffend as moontlik bestuur moet word en na die noodsaadlikheid daarvan dat daar by alle betrokkenes 'n beter begrip moet wees van die belangrikheid van die werk wat deur die V.M.E.O. gedoen word.

In die loop van sy toespraak ter sekondering van die mosie van dank sê mnr. G. C. Theron (Vandarbijlpark) :

Dan was daar die wysiging van die Grondwet wat vir soveel jare oor ons gehang het en byna jaarliks 'n warm patat was. Maar dit alles was nodig om vir ons beleidshelderheid vir die jare sewentig te gee wat ons nou positief moet toepas en uitbou.

Die nuwe Bestuur sal moet poog om, eerstens, binnelands deur vinnige en positiewe optrede hulp en advies aan elke klein of groot onderneming sowel as

aan elke magtige staatsdepartement wat die VMEO se opinie ook soek, te verskaf. Op dié manier sal die VMEO 'n gesiene plek in die landshuishouding kan inneem. Vir dié doel is die Grondwet opgeknap om vir vinnige optrede voorsiening te maak. Maar dan moet die uitnodiging tot direkte dialoog van die L.U.K., mnr. Ferreira, soos in u rede aangehaal, aanvaar word en die VMEO moenie gebind wees om net

deur die V.M.B. op te tree nie. Die pas is tans te vinnig vir sulke omslagtige optrede.

Tweedens moet die Vereniging verder kyk as ons landgrense. Ander wil graag met ons kontak maak en van ons kennis en ondervinding gebruik maak. Sekerlik sal ons ook deur kontak van ander kan leer en die wedersydse kommunikasie sal die ondernemings plaaslik in ons land in sy geheel tot voordeel strek.

Die ander saak wat die President aangeroer het en wat my ná aan die hart lê, is die uitbouing van streeksorganisasies. Met uitsondering van moontlik die groot stede is ons plaaslike owerhede in Suid-Afrika, gemeet teen oorsese standaarde, eintlik maar klein en die moderne kommunikasiemiddels het ook ons groot afstande klein gemaak. Nou is ek geensins 'n voorstander van saamsnoering (samesmelting) van organisasies net vir die status van groot wees nie, maar ek is oortuig dat die kapitaal en mannekrag bates van ondernemings met groter vrug benut kan word indien op 'n streeksbasis opgetree word, en dit kan gedoen word. Die Hoofinspekteur van Fabrieke het vir ons die deur daartoe oopgemaak. Laat ons as raadslede en ingenieurs nooit vergeet dat die behoud van plaaslike besture uiteindelik nie lê in die aantal stemme wat gemonster kan word nie, maar in die gehalte diens wat aan die verbruiker aangebied word. Eendrag maak Mag maar ons moet nie wag totdat dit op ons afgedwing word nie.

The President responded to the vote of thanks.

Greetings were next conveyed to the President and the Convention by Mr. R. W. Barton on behalf of the President and members of the South African National Committee on Illumination and Mr. A. P. Burger on behalf of the South African Institute of Town Clerks.. Capt. P. G. Joynt, as President of the Transvaal Agricultural Union Electricity Committee, Mr. J. J. Hattingh (Pretoria) on behalf of the United Municipal Executive of South Africa, Strawson (Johannesburg) as Chairman of the British Electrical and Allied Manufacturers' Association Local Committee, Mr. A. A. Middlecote (Pretoria) on behalf of the Director General and staff of the South African Bureau of Standards, Mr. Jan H. Smith (Johannesburg) on behalf of the Electricity Supply Commission. He conveyed the apologies of Dr. Straszacker who would only be able to join the Convention at a later stage.

Die President antwoord op die mosie van dank.

Groete word hierna aan die President en die Konvensie oorgedra deur mnr. R. W. Barton namens die President en lede van die S.A. Nasionale Komitee vir Verligting en mnr. A. P. Burger namens die Suid-Afrikaanse Instituut van Stadsklerke, Kapt. P. G. Joynt, President van die Elektrisiteitskomitee van die Transvaalse Landbou-unie, J. J. Hattingh (Pretoria) namens die Verenigde Munisipale Bestuur van S.A., Strawson (Johannesburg) as Voorsitter van die plaaslike Komitee van die Britse Vereniging van Elektriese en Aanverwante Vervaardigers, mnr. A. A. Middelcote (Pretoria) namens die Direkteur-Generaal en personeel van die S.A. Buro vir Standaarde en mnr. Jan H. Smith (Johannesburg) namens die Elektrisiteitsvoorsieningskommissie. Hy vra verskoning vir die afwesigheid van Dr. Straszacker wat eers later die Konvensie sal kan bywoon.

First Day, AFTERNOON SESSION

The President introduced discussion on the adoption of the proposed amended Constitution which had been duly circulated to all members. He called upon Mr. G. C. Theron (Vanderbijlpark) to speak on the matter. Mr. Theron said :

In die eerste instansie, as Sameroeper van hierdie Sub-komitee wat vir byna twee jaar gehandel het met hierdie voorgestelde nuwe Grondwet, wil ek die lede van die Sub-komitee baie hartlik bedank vir hulle samewerking, hulle ondersteuning en al hulle hulp, en dit geld ook vir diegene wat kommentaar gelewer het op die voorstelle wat ingedien was. Ek sal egter my plig versaak as ek nie by name mnr. Pretorius noem nie. Hy het 'n reuse rol gehad, mnr. die President, in die opstel van die Afrikaanse teks van hierdie Grondwet en hy het vir ons op die nou en regte paadjie gehou wat Afrikaans betref, leestekens ens. en daarvoor wil ek hom baie bedank.

Eerste Dag, NAMIDDAGSITTING

Die President stel die kwessie van die aanname van die voorgestelde gewysigde grondwet, wat aan alle lede omgestuur is, oop vir bespreking. Hy vra mnr. G. C. Theron (Vanderbijlpark) om oor die saak te praat. Mnr Theron sê :

Die VMEO is moontlik die enigste Vereniging op munisipale vlak in die Republiek van Suid-Afrika waarvan die lede bestaan uit raadslede as afgevaardigdes van plaaslike besture en munisipale ingenieurs op gelyke voet. Die raadslede is nie net gaste nie maar is hier in hulle eie reg. Dit het in die verlede baie goeie vrugte afgewerp en is moontlik die rede waarom die VMEO sulke hoë aansien in die land geniet.

On rede van hierdie noue koppeling van die VMEO met die derde vlak van Regering het die Departement van Binnelandse Sake in 1966 na die Vereniging se Grondwet gekyk en gevind dat wysig-

ings aangebring sal moet word ten einde te voorkom dat die Staat moontlik in die verleentheid mag kom.

Assistance for and co-operation with associations outside the borders of the Republic was, however, strongly supported by the State Department but on a different principle to that in the old Constitution. After represen.ations by the AMEU the Association was granted a respite until 1971 to affect the necessary changes. Certain other requirements in the Constitution which impede the administration of the Association were also reviewed with the principle object of stream-lining the AMEU to meet the challenge of the 70's..

'n Sub-komitee bestaande uit nege persone is saamgestel om die Grondwet te hersien en die voorgestelde konsep is in Oktober 1970 aan alle lede, geaffilieerdes en andere gestuur vir kommentaar. Uit bykans 280 ondernemings, geaffilieerdes en ander persone aan wie die dokument gestuur is, is kommentaar en voorstelle van 8; en aan elkeen van die persone is die komitee baie dank en waardering verskuldig.

Die kommentaar is deur die Uitvoerende Raad op 'n vergadering gehou op 18 Februarie 1971 oorweeg. Uit die voorstelle is sommige met of sonder wysiging deur die Uitvoerende Raad aanvaar en die konsep-Grondwet wat op 19 Julie 1971 vrygestel is —en nou te tafel gelê word—is die finale produk.

I want to draw attention to a few of the major changes :

Clause 1.6 : The Constitutional limits of the Association are now the borders of South Africa and South West Africa, but, mindful of our friends outside these limits, Clause 6.1 provides, "Those natural persons in other territories who were members of the Association on the date of the adoption of this Constitution shall be members of the Association. No retirement or change of status will affect the membership of such natural persons as held at the time of adoption of this constitution."

Furthemore Clause 4.7 enables the Association to assist organisations outside the borders of South Africa and I'm sure that the new Executive in the spirit of this Constitution will not be slow in developing these lines of communication and reviewing the invitation list.

Artikel 14 : Daar is weggedoen met verteenwoordigers van die takke aangesien dit in die verlede nie baie bevredigend bewys is nie. Ten einde 'n sekere mate van verspreiding van verteenwoordigers te verseker is vyf streke afgebaken, elk waarvan op een gekose lid geregtig sal wees. Die streke se grense is bepaal om min of meer 'n gelyke aantal ondernemings in te sluit en gemeenskaplike belange te dek. Daar word vertrou dat die persone wat genomineer word aan die lede uit die streke bekend sal wees en dus aan artikel 14.2 sal voldoen.

Artikel 16.4 : Dan is daar voorsiening gemaak vir die instelling van 'n dagbestuur om die administrasie volgens gedelegeerde magte en vir dringende aangeleenthede waar te neem. Sodoende word daar gepoog om vertragings uit te skakel en aan die lede beter diens te lewer.

Maar, mnr. die President, daar is ongelukkig in die stukke wat gepubliseer was etlike klein drukfoute wat hoofsaaklik op punktuasie neerkom. Unfortunately there were in the text as published a few mistakes which are mainly printing errors and, in proposing the adoption of this proposed Constitution, I will ask the Convention to permit me to correct them in the final report.

Daar is voldoen aan die voorskrifte van artikel 24 van die Grondwet ter wysiging van die Grondwet en die aanvaarding van die konsep-grondwet soos deur die Uitvoerende Raad voorgestel en op 19 Julie 1971 gesirkuleer, en daar word nou voorgestel dat dit aanvaar word.

I now propose acceptance of the draft Constitution as submitted by the Executive Council and circulated on 19th July, 1971, subject to correction of the few printing errors.

The President continues :

Die President gaan voort deur te sê :

Ek wil net graag daarby aanvul by wat mnr. Theron gesê het en dit is onder 6.1 waar hy tereg gewys het op die klein foutjies wat daar ingekom het bv. "territories who 'were'" should read "territories who 'are' members of the Association.

For the sake of clarification I would like to propose further that after the words ". . . or living in South Africa . . ." we insert the phrase "and notwithstanding the definition in 7.2.2" — "Those natural persons in other territories who are members of this Association." This will cover our Rhodesian friends adequately, and if the Convention agrees to this, the Executive will then make the necessary alterations. This makes it quite clear that Rhodesian engineer members retain their membership of this Association.

The proposal to adopt the Constitution was seconded by Mr. E. de C. Pretorius (Potchefstroom) who thanked Messrs. Ewing, Conradie and Theron for their part in evolving the new Constitution. Messrs.

Die voorstel ter aanname van die Grondwet word gesekondeer deur mnr. E. de C. Pretorius (Potchefstroom) wat mnre. Ewing, Conradie en Theron bedank vir hul aandeel in die totstandkoming van die nuwe

E. E. de Villiers (Rustenburg) and P. J. Botes (Roodepoort) contributed to the discussion and the Constitution as appended to these Proceedings was unanimously adopted.

In thanking the members of the Association for their support in this matter, the President paid particular tribute to Mr. G. C. Theron (Vanderbijlpark) and Mr. E. de C. Pretorius (Potchefstroom) for their work in its evolution.

The Convention proceeded to elect the incoming Executive Council after nominations had been duly made and the President announced that in addition to the President and President Elect, those automatically elected were Mr. K. G. Robson (East London) Southern Region, Mr. H. C. Dreyer (Paarl) Western Region, and Mr. D. H. Fraser (Durban) Eastern Region. Ballot proceeded for the remaining five members with Messrs T. E. Wilkinson and E. B. Martin as scrutineers. The ballot resulted in the election of Messrs. E. E. de Villiers (Rustenburg), P. J. Botes (Roodepoort), D. C. Plowden (Johannesburg), R. W. Barton (Welkom) and E. de C. Pretorius (Potchefstroom). In declaring the result of the election the following morning, the President thanked those past members of the Eecutive who had not been re-elected for the services they had rendered to the Association.

Grondwet. Mnre E. E. .de Villiers (Rustenburg) en P. J. Botes (Roodepoort) lewer bydraes tot die bespreking en die Grondwet, soos by hierdie Verrigtinge aangeheg, word eenparig aanvaar.

Toe hy die lede van die Vereniging vir hul ondersteuning in hierdie verband bedank, bring die President besondere hulde aan mnr. G. C. Theron (Vanderbijlpark) en mnr. E. de C. Pretorius (Potchefstroom) vir hul werk in verband met die totstandhouding van die Grondwet.

Die Konvensie gaan voort met die verkiesing van die nuwe Uitvoerende Raad nadat nominasies behoorlik ingewag is en nadat die President aangekondig het dat, behalwe die President en die Aangewese President, diegene wat outomaties verkies is, mnre. R. G. Robson (Oos-Londen) Suidelike Streek, mnr. H. C. Dreyer (Paarl) Westelike Streek, en mnr. D. H. Fraser (Durban) Oostelike Streek is. 'n Stemming vir die orige vyf lede word gehou, met mnre. T. E. Wilkinson en E. B. Martin as stemtellers. Die uitslag van die stemming is dat mnre. E. E. de Villiers (Rustenburg), P. J. Botes (Roodepoort), D. C. Plowden (Johannesburg), R. W. Barton (Welkom) en E. de C. Pretorius (Potchefstroom) as verkose verklaar word. Toe hy die volgende oggend die uitslag van die stemming aankondig, bedank die President die gewese lede van die Uitvoerende Raad wat nie herkies is nie, vir die dienste wat hulle aan die Vereniging gelewer het.

Before proceeding with the next item on the agenda, the Report of the Secretaries (which appeared in Volume (1) of the Proceedings), he referred to the fact that there had been some confusion with regard to the name of a deceased member. He announced that Mr. H. Fohren of Eshowe had passed on as also Mr. Scotty Lees of Benoni, and Mr. Relihaan, formerly of Paarl. The Convention stood in silent tribute.

Voordat hy met die volgende item voortgaan, naamlik die verslag van die Sekretariaat (wat in Volume 1 van die Verrigtinge verskyn het) verwys hy na die feit dat daar 'n mate van verwarring ontstaan het in verband met die naam van 'n afgestorwe lid. Hy sê dat mnr. H. Fohren van Eshowe, sowel as mnr. Scotty Lees van Benoni en mnr. Relihaan, voorheen Elektrotegniese Stadsingenieur van Paarl oorlede is. 'n Mosie van roubeklag word staande aanvaar.

The President called upon Mr. D. C. Plowden (Johannesburg) to propose the adoption of the Secretaries' Report. Mr. Plowden said :

Die President vra mnr. D. C. Plowden (Johannesburg) om die aanname van die verslag van die Sekretariaat voor te stel. Mnr. Plowden sê :

Probably the item which has attracted greatest general interest in this Report is the reference to the new Constitution which was adopted earlier this afternoon. As the Report states, there are fundamental changes, some of which are far-reaching. I want to refer only to that unfortunately unavoidable change which results in Rhodesian members no longer being able to occupy the status in this Association which has been open to them for such a very long time. This Association can only be the richer for the contribution that our Rhodesian friends have made to its development and this will long be remembered.

Turning now to matters of finance, it's most satisfactory to see that for the year ending 28th February, 1971 we finished with an excess of income over expenditure which reduces the consolidated deficit for the 2 year period under review to R996.00. This happy position results largely from the decision taken by your Executive Council in December 1969 to levy a fee for attendance at Technical Meetings and

Conventions. This was imposed for the first time at the Technical Meeting held in Potchefstroom during May, 1970.

You will have noted that reference is made in the body of the Report to the consolidated deficit as being R1 051.00 instead of R996.00. This is due to a final adjustment in the accounts which was made after the Report was drafted.

Production of the Proceedings for the Umtali Convention and the Potchefstroom Technical Meeting shows the combined total loss of R3 244.00. We're all aware that it is extremely difficult to publish a journal of this nature on a break-even basis because the only sources of revenue are from sales to members and advertising fees. The support of members in purchasing additional copies for the use of their various staffs, while it could be improved, is nevertheless not unreasonable.

On the score of advertising, however, I note that Volumes 1a and 1b of the Proceedings for this Convention together carry only 18 advertisements. This is not very much when one reads in the Report that the total number of affiliates, almost all of whom are operating in the commercial and industrial fields, stands at 95. It is true that our Proceedings have a limited circulation but one must not overlook the fact that every copy finds its way to the very people whose attention is desired by suppliers of electrical and associated equipment.

We are dependent for a very large part of our income on annual subscriptions from member undertakings which presently number 136. If the remaining 170 odd undertakings eligible for membership could be persuaded to join, the Association's income would be increased by over R4 000.00 per annum, based on the scale hitherto applicable. This would be hoping for too much but if only those undertakings with annual sales exceeding 1 million units could be brought into the fold, the revenue would increase by nearly R3 000.00. This is worth thinking about.

Once again our thanks are due to our Secretaries, Dick Ewing and his staff, for the excellent way in which they look after the affairs of this Association: and here I want also to refer to Miss Brewin who so ably looks after the Johannesburg end of the business, including the organising of the frequent meetings of the Recommendations Committee for New Electrical Commodities.

The adoption of the report was seconded by Councillor B. D. Eager (Johannesburg).

There being no further discussion, the report of the Secretaries was then formally adopted by the Convention.

Having time on hand, the Convention proceeded to consider Annual Reports of Sub-Committees.

(1) Electrical Wiremen's Registration Board—Speaking as representative, Mr. J. K. von Ahlften said :

As you will have noted from the contents of the Report the Board's concession that was made in 1970 to get practising wiremen to enter for registration has been extended to the end of 1971, after which date the Act will be enforced. And here I would like to take the opportunity of calling on member undertakings to assist the Board in its efforts to get as many as possible of the practising unlicensed wiremen to register, and to ensure that Section 20 of the Act will be strictly enforced after 1971.

I have nothing further to add to the Report as submitted to the Convention. All we know is that the results of the Board trying to get these people to come forward for registration have not been those expected and that the Board now has no alternative but to enforce the Act after 1971.

Mr. Wannenburg may wish to add to his Report tomorrow as he is apparently not present at the moment.

Before I open the Report for discussion I would just like to express our appreciation to Mr. Lombard for the valuable work he's done during the many years he's been a member of this Board. I can assure you, gentlemen, it's quite a hardy annual. The Report is now open for discussion.

As all concerned were not present at this Session of the Convention, it was agreed at this stage to defer further consideration of reports.

Die aanname van die verslag word gesekondeer deur Raadslid B. D. Eager (Johannesburg).

Aangesien daar geen verdere bespreking is nie, word die verslag van die Sekretariaat formeel deur die Konvensie aanvaar.

As gevolg van die feit dat daar nog tyd oor is, gaan die Konvensie voort om die Jaarverslae van Subkomitees te oorweeg.

(1) Registrasieraad vir Elektrotegniese Draadwerkers—In sy hoedanigheid as verteenwoordiger sê mnr. J. K. von Ahlften :

Aangesien al die betrokkenes nie by hierdie sitting van die Konvensie teenwoordig is nie, word besluit dat geen verdere verslae in hierdie stadium oorweeg sal word nie.

Mr. H. Barnard (Brakpan) took the opportunity of conveying his thoughts on translation in Proceedings and other matters. The President thanked Mr. Barnard for his thoughts and advised that they would be considered by the Executive Council which was always endeavouring to streamline administrative procedures and overcome problems relating to translation.

Mnr. H. Barnard (Brakpan) neem die geleentheid te baat om sy gedagtes in verband met vertaling van die Verrigtinge en ander sake oor te dra. Die President bedank mnr. Barnard vir sy idees en sê dat dit deur die Uitvoerende Raad oorweeg sal word, welke liggaam ten alle tye probeer om die stroombelyning van administratiewe prosedures te bewerkstellig en om probleme in verband met vertaling te oorbrug.

SECOND DAY

MORNING SESSION

In introducing his paper "The Application of Modern Management Principles and Techniques to a Municipal Undertaking" as published in Volume (1) of the Association's Proceedings for 1971, Mr. J. S. du Toit, B.Com., B.Admin., A.I.A.C.(S.A.), A.I.T.C. (S.A.), S.A.I.O.M. (Town Clerk of Roodepoort), presented the greetings to the Convention of the Local Government Division of the South African Institute of Organisation and Methods.

Mr. du Toit expanded on his paper comprehensively and copies of a verbatim report thereof may be obtained by arrangement with the Secretaries.

After formally thanking the speaker, the President said :

TWEEDE DAG

OGGENDSITTING

Toe hy sy referaat „Die Toepassing van Moderne Bestuursbeginsels en -tegnieke op 'n Munisipale Onderneming" soos in Volume (1) van die Vereniging se Verrigtinge vir 1971 gepubliseer, aan die Konvensie voordra, bring mnr. J. S. du Toit, B.Comm., B.Admin., L.I.A.H. (S.A.), A.I.S.K.(S.A.), S.A.I.O.M. (Stadsklerk van Roodepoort) die groete van die Plaaslike Bestuursafdeling van die Suid-Afrikaanse Instituut van Organisasie en Metodes aan die Konvensie oor.

Mnr. du Toit brei uitvoerig op sy referaat uit en afskrifte van 'n verbatimverslag daaroor kan by wyse van onderhandeling met die Sekretariaat verkry word.

Nadat hy die spreker formeel bedank het, sê die President :

Ek het u referaat ook deurgegaan en 'n paar interessante opmerkings daar gesien veral op bl. 21 waar u kortliks wys op bestuurskomitees en gesê het: „. . . want aan die doeltreffende funksionering van hierdie uitvoerende beamptes word die sukses of andersins van bestuurskomitees gemeet." Die vraag het toe by my opgekom dat dit seker ewe wel van toepassing is op 'n bestuurskomitee as op die ou uitgediende komiteestelsel soos ons dit in die Transvaal geken het. Ek sou graag verder oor die saak iets wou hoor.

In die geheel gesien, mnr. du Toit, het u ons 'n baie interessante referaat gegee want dit is seker die een onderwerp waaraan ons almal meer aandag behoort te gee. Bloot geoordeel aan die syfers wat u genoem het—1% verhoging op produksie, met die geweldige verskil wat dit maak aan die uitgawerekening van 'n plaaslike bestuur: dit in sigself is 'n groot motivering om beter te kan bestuur.

Ek laat dit nou liewers aan die gehoor oor om verder op die referaat in te gaan. Ons is bevoorreg om nog 'n Stadsklerk in ons midde te hê, dit is my eie Stadsklerk van Springs, mnr. J. F. van Loggerenberg, en hy het ingewillig om die bespreking op hierdie referaat van u in te lei.

Mr. J. F. van Loggerenberg (Springs) said :

Ek wil mnr. du Toit opreg gelukwens met 'n uiters geslaagde referaat wat tegnies sowel as taalkundig getuig van die werk van 'n kenner op die gebied van die beginsels van bestuur. Ek is veral bly dat 'n persoon van mnr. du Toit se kaliber genader is om oor hierdie onderwerp te praat. Ek dink u keuse van die onderwerp is nie alleen noodsaaklik nie maar

Mnr. J. F. van Loggerenberg (Springs) sê :

geskied op 'n gepaste tyd en plek.

Dit is 'n alombekende feit dat daar 'n teenkanting teen moderne beginsels en tegnieke van bestuur by plaaslike owerhede in die algemeen, en meer spesifiek by ou-garde hoofde van departemente van plaaslike owerhede bestaan. Mnr. du Toit het myns insiens 'n referaat gelewer wat nie alleen vir u as elektrotegniese

ingenieurs van uiterste belang is nie maar ook vir stadsklerke en ander departementshoofde. Dit kom duidelik uit sy referaat voor dat stadsklerke en hoofde van departemente die bestuurders in 'n plaaslike owerheid is. Aangesien ander hoofde van departemente nie hier teenwoordig is nie, vertrou ek dat die Raadslede wat afgevaardig is die kennis wat hulle uit hierdie referaat sal put aan hulle onderskeie plaaslike owerhede sal oordra.

Die referaat is so kompak en die benaderings volg so logies op mekaar dat dit eintlik moeilik sal wees om oor al die aspekte deur mnr. du Toit genoem kommentaar te lewer. Ek wil egter probeer om te kyk tot watter mate sekere stellings in die referaat in die praktyk in 'n munisipaliteit toegepas kan word. Ten eerste het hy die bestuursfunksies omskryf en hy ken 'n baie hoë rol toe aan die element koördinasie. Ek dink dat koördinasie is van die uiterste belang in plaaslike bestuur. Ek twyfel of daar één onderneming in die private sektor is waar daar sò 'n groot verskeidenheid van aktiwiteite is as in 'n munisipaliteit; wat meer is, die werksaamhede van 'n stadsraad word verdeel in 'n aantal afsonderlike departemente wat elkeen as sulks individueel optree, in sommige gevalle tot 'n mate in 'n waterdigte departement. Maar tog strengel die werksaamhede so inmekaar dat daar gedurig oor en weer kontak gemaak en gekoördineer moet word.

In die bedeling in Transvaal is een van die funksies van die stadsklerk om die werksaamhede van die stadsraad te koördineer maar in die alledaagse uitvoering van hulle onderskeie pligte is dit noodsaaklik dat 'n hoof van 'n departement en sy senior amptenare moet konfereer en saamwerk met hoofde en senior amptenare in ander departemente.

Mnr. du Toit merk tereg op dat hoofde van departemente die top-leiding uitmaak. Dit is derhalwe die taak van die goeie departementshoof om hierdie oorlegpleging en koördinasie tot 'n fyn kuns te ontwikkel. Dit is die hoof van die departement wat die opleiding aan die leiers van die klein groepe, soos, mnr. du Toit hulle noem, moet gee sodat die nodige koördinasie in besonder in die betrokke departement, maar in die algemeen, ook tussen-departemente, kan bestaan. Dit sal meehelp om daardie spanwerk te bewerkstellig wat so noodsaaklik is vir suksesvolle bestuurswerk.

Mnr. du Toit het die vereiste vir 'n goeie bestuurder gestel maar terselfdertyd daarop gewys dat sover plaaslike owerhede aangaan, die bestuurder met verskillende frustrasies en probleme te kampe het wat nie in die privaat sektor bestaan nie. Mnr. die President, dit is juis daardie verskille tussen die privaat sektor en die publieke sektor wat help om die goeie en die swak bestuurder te onderskei.

Ons as munisipale bestuurders moet aanvaar dat daar verkose raadslede is wat kiesers in 'n gemeenskap verteenwoordig. Die kieser het sekere behoeftes en voorkeure. In a demokratiese land gee die mening van die meerderheid die deurslag. Die raadslid, as verkose teenoordiger van die kieser, kom gedurig in kontak met die kieser en derhalwe is hy, meer as die departementshoof, bewus van die alledaagse behoeftes van die kieser. Bo en behalwe hierdie alledaagse behoeftes van die kieser verg die bestuur van 'n dorp en stad ook vooruitbeplanning in die algemeen, sake wat die kieser moontlik nie van bewus is nie.

Die munisipale bestuur moet dus ook oor die vermoë beskik om in sy beplanning voorsiening te maak vir hierdie alledaagse behoeftes van die kieser sowel as—soos dr. Diederisks, waarna mnr. du Toit verwys het, dit gestel het—die inisiatief te voorsien om die hoogste moontlike lewenstandaard vir alle groepe moontlik te maak. Daardie vooruitbeplanning van toekomstige gebeure moet dus nie slegs gemik wees op die breë algemene ontwikkeling van die dorp of stad nie maar ook vir daardie klein dingetjies wat die goeie verhouding tussen kieser en raadslid en tussen raadslid en hoofde van departemente bevorder. Die munisipale bestuurder moet altyd in gedagte hou dat 'n plaaslike owerheid eerstens ingestel is om diens aan sy inwoners te lewer, in teenstelling met die privaat sektor waar die wins-motief seker oorheers.

Ek dink, mnr. die President, dat die besonderhede wat mnr. du Toit in paragraaf 3.2 gee oor beplanning behoort elke hoof van 'n departement gedurig byderhand te hou en na te verwys. My ondervinding in munisipaliteite is egter dat al my mooi vooruitbeplanning soms maklik in die war gestuur word deur daardie klein jakkalsies wat in die wingerd kom. Alles is mooi uitgewerk en dan vind daar 'n ramp of noodtoestand, of selfs 'n fees of 'n skou, of iets dergeliks plaas wat die onmiddellike aandag van die hoof van die departement moet kry. Dit is hier waar die goeie bestuurder by uitstek homself bewys as hy oor die vermoë beskik om vinnig sy program te verander en in ander kanale te stuur sonder dat onnodige vermorsing plaasvind. Hy moet vinnig nuwe prioriteite kan bepaal—prioriteite wat syns insiens miskien nie voorkeur behoort te kry nie maar, soos ek daarna verwys het, die raadslid verwag dit en die raadslid staan naby die kieser wat dit verlang, en daarom moet die hoof van die departement in daardie vermoë wees om sy gedagte-rigting te verander om daardie voorkeure te bepaal.

Ek dink ook die kongres is dank verskuldig aan mnr. du Toit vir die duidelike wyse waarop hy die begrip gekoördineerde organisering in paragraaf 4 uiteengesit het. Ek het veral met belangstelling sy menings oor delegering in paragraaf 4.2 gevolg. Myns insiens is delegering een van die belangrikste, maar aan die anderkant ook een van die moeilikste, funksies van 'n bestuurder. Dit is nie elkeen wat oor die vermoë beskik om te delegeer nie. So baie bestuurders vergeet dat om te delegeer beteken dat die persoon aan

wie 'n sekere funksie gedelegeer is, daardie funksie nou moet uitvoer m.a.w. daardie persoon tree nou in plek op van die bestuurder.

Daarom stem ek heelhartig saam met mnr. du Toit se mening dat verantwoordelikheid sowel as gesag gedelegeer moet word. Om slegs take waarvan die bestuurder nie hou nie, of sleurwerk op 'n ander af te skuif—of soos u netnou gesê het oor die skouer te loer—is myns insiens ook nie delegasie nie.

Ten besluite, mnr. die President, wil ek verwys na mnr. du Toit se menings oor personeelontwikkeling en, meer in besonder, opleiding. Daagliks gebeur dit in 'n munisipaliteit dat wanneer 'n' nuwe aanstelling gemaak word, die persoon hom heeltemaal verlore voel n sy nuwe omgewing en maar deur hier te vra en daar te ondersoek, en dan soms afjakke van sy kollegas te kry, vas te stel wat van hom verwag word. Hoeveel kosbare tyd, arbeidskrag en geld gaan nie verlore nie.

Opleiding dwarsdeur 'n werker se loopbaan is noodsaaklik. Dit verhoed nie alleen dat werkers in 'n groef raak nie, maar dit verseker dat die munisipaliteit voortdurend die voordeel het van kennis oor nuwe en moderne tegnieke. Ek dink as elke werker behoorlik in sy werk opgelei is met inagneming van tegnieke oor doeltreffendheid, dan sal ons huidige sogenaamde arbeidstekort omskep kan word in 'n arbeids-surplus.

In Springs het die Raad onlangs begin met 'n intensiewe opleiding en bekendstelling van die nuwe aanstelling in sy besondere pos, sowel as opleiding in doeltreffendheids tegnieke, en ek kan u verseker dat die beleid reeds op dié vroeë stadium goeie vrugte afwerp.

Ek wil net graag, mnr. die President, na die een aanvegbare punt wat mnr. du Toit daar genoem het, verwys en dit is die kwessie van langtermyn-beplanning. Ek wil hom net graag hierdie vraag vra : u sit vandag in die plaaslike bestuursektor waar dienste gelewer moet word na die proklamering van dorpsgebiede, talle dorpsgebiede. U in Roodepoort sit met die probleem, ons in Springs sit met hom: ou dorpsgebiede word omskep, nuwe dorpsgebiede moet geproklameer word. Jy verwag proklamasie in drie of ses maande; jy verwag dit in die komende jaar of miskien in twee jaar en dan duik daar probleme op wat maak dat daardie proklimasie agterweë gehou word en partymaal drie jaar talm waar u gereken het hy oor ses maande geproklameer sou word. Hoe is dit moontlik altyd om so sekuur op die langtermyn te beplan?

Nogmaals baie hartlik dank, mnr. die President. Ek dink 'n mens sou nog veel meer kon gesê het oor mnr. du Toit se referaat maar ek laat dit liewers oor om vir baie meer mense die geleentheid te gee om daaroor te praat.

In his contribution to the discussion, Mr. J. A. Loubser (Benoni) said :

Die kwessie van privaat dorpseienaars: ons daar in Benoni het 'n geval van 'n stuk grond wat in 1968 geproklameer sou gewees het. Fondse is op die begroting voorsien om die dorp to retikuleer en tot op hierdie stadium is die werk nog nie gedoen nie want die dorp is nog nie geproklameer nie.

Nou ongelukkig is dit so in plaaslike bestuur dat die twee werke-departemente—genaamd die ingenieursafdelings - eintlik lynreg in stryd met die tesourierdepartement is—die een wil die geld spandeer en die ander een wil keer dat dit gespandeer word ! Dis jammer dat dit so is maar dit is werklik so.

'n Mens raak verbonde in, sal ons maar sê „redtape." Ek wil graag weet of dit moontlik is dat 'n dorpsgebied geretikuleer kan word sonder om van die fondse van die Raad gebruik te maak m.a.w. sonder dat dit op die begroting van die Raad moet verskyn. U weet normaalweg in so 'n privaat dorpsgebied is daar 'n memorandum van ooreenkoms, 'n beslissing dat die retikulasie terugbetaalbaar is bv. wanneer 60%

In sy bydrae tot die bespreking sê mnr. J. A. Loubser (Benoni) :

van die erwe bebou is. Dan moet die Raad nou aan die privaat dorpsontwikkelaar die koste terugbetaal.

Is dit nie die plig van die ingenieur slegs om te bepaal wanneer 60% van die erwe bebou sal wees? Is dit moontlik dat die dorpseienaars die fonds kan voorsien? (Dit word so verwag natuurlik.) Maar is dit nodig dat dit werklik op die begroting moet verskyn? dat die Raad homself moet breek om sy begroting te beperk elke jaar? Ons word maar almal gevra om die begroting te sny maar 'n mens kan natuurlik nie 'n dorpsontwikkeling sny nie want dit is noodsaaklik.

Ek voel dat so 'n privaat dorp moet beskou word as heeltemaal 'n nuwe aansluiting soortgelyk aan die aansluiting wat u vir 'n huis maak. Die man kom en hy betaal jou die koste van die aansluiting en jy gaan doen vir hom dan die werk.

So ek kan nie heeltemaal sien hoekom dit deel van die begroting moet uitmaak nie, en dit is al vraag wat ek aan mnr. du Toit wil stel.

In his comments, Mr. E. E. de Villiers (Rustenburg) said :

In sy kommentaar sê mnr. E. E. de Villiers (Rustenburg) :

Gedurende Augustus vanjaar het ons Stadsraad besluit dat die Stadsklerk, Bestuurskomiteelede en hoofde van departemente 'n seminaar van die Suid-Afrikaanse Instituut van Organisasie en Metodes op Buffelspoort naby Rustenburg bywoon; eintlik die afdeling Plaaslike Bestuur. Daar het ek die voorreg gehad om mnr. du Toit te ontmoet en ook in 'n besprekingsgroep te wees oor 'n paar referate wat deur hom gelei was. Ek moet sê ek was baie beïndruk, nie alleenlik deur die referate nie, maar ook die besprekings wat ons gehad het en die leiding van mnr. du Toit. Daarom wil ek ook vir u gelukwens dat u die insig gehad het om oor hierdie kontensieuse onderwerp—tog een van geweldige groot belang—vir ons by hierdie Konvensie 'n lesing te laat kry deur mnr. du Toit. Dié sal natuurlik opgevolg word na teepouse deur die lesing van mnr. Botes. Ek dink dit is van absolute lewensbelang vir stadsrade en in besonder vir ons elektrisiteitsdepartemente dat ons sover moontlik hierdie sake in die praktyk in werking moet stel.

Ek wil net een of twee punte maak in verband met die referaat. Soos die vorige spreker gemeld het was dit ook vir my baie insiggewend gewees veral die vrae wat aan ons gestel is om, so te sê, ons hand in eie boesem te steek. U weet dit is algemene kennis dat die mens net sy sonde ken deur die tien gebooie. Nou glo ek dat hierdie 15 gebooie ons sal laat besef watter groot sondes ons in die praktyk gewoonlik doen in ons werk. Ek sal dit ook werklik ter harte neem en probeer om myself te verbeter. U kan daarvan verseker wees.

In die geskrewe referaat onder „Beplanning" wat my ook geweldig aangegryp het, is daar net een paragraaf waarmee ek voel ek nie kan saamstem nie. Dit handel oor die gebruik van hulpmiddele waaronder mnr. du Toit poelvragmotors noem met 'n vervoersuperintendent wat, soos hy dit stel, „betyds reëlings kan tref vir die rasionele aanwending van sulke vragmotors." My ondervinding het my gewys dat selfs in my eie Departement kan ek nie onderafdelings se vervoer so koördineer dat ons dit kan poel nie. Dit is 'n geweldige probleem, die vervoer, en ek voel dat as u probeer om alle departemente se vervoer te koördineer gaan u uiteindelik méér voertuie aanhou as op die huidige oomblik.

Ek sal bly wees as mnr. du Toit vir my kan verduidelik hoe mense te werk moet gaan om so 'n rasionele aanwending van poelvragmotors vir alle departemente te kan bewerkstellig.

Mr. President, under the same heading of "Planning" at the end of sub-paragraph (d) of paragraph 3.2 Mr. du Toit says that good planning "prevents the work from coming to a standstill to determine the next step or to wait for materials to arrive on the job." This delivery of materials is a very contentious subject and I should like to say a few words on it since it seems to be so indeterminable these days. As you know suppliers are loth to accept, shall we say, a penalty for any late delivery and, if they do accept it, it is usually watered down as to be not worth the paper it's written on! I've often found also that very shortly after adjudication of a contract the supplier writes to say that his delivery has fantastically increased, sometimes even doubled, which makes it very, very difficult to plan for the completion of a job.

I don't know how other delegates feel about this subject but it is something that has made me very unhappy in the past. Perhaps some of the affiliates would like to comment on this.

Mr. H. Barnard (Brakpan), in the course of his comments, said :

Daar is egter baie punte waaroor ons nie kan saamstem nie en alhoewel dit miskien vir mnr. du Toit sal lyk asof ek hom gaan aanval, is dit nie die bedoeling nie. Dit is meer 'n kwessie van die toepassing in die praktyk van die referaat se punte wat hy genoem het. Ek het in die geskrewe referaat 'n paar strepies getrek en as u my sal vergun om hulle so een vir een te behandel dink ek gaan dit die maklikste wees.

Op bl. 19 sê mnr. du Toit (en hierdie punt was al voorheen aangeraak) : „Management as one finds it in practice is, to a greater or lesser degree, usually defective. Municipal undertakings are no exception. It is, therefore, important that we in municipal service shall take notice of the techniques that have been developed by the more competitive private sector in order that we may be more effective in carrying out

Mnr. Barnard (Brakpan) sê in die loop van sy kommentaar :

our own management functions." Mnr. die President, hierdie is vir my baie, baie raak gesê maar ons moet slegs hier kyk wat bedoel word by die „mededingende bedryfslewe" wat genoem word. Soos u self weet is die munisipaliteite ongelukkig in hierdie posisie geplaas waar die personeel wat beskikbaar is baie moeilik bekombaar word. Die rede daarvoor is hoofsaaklik dat die private sektor personeellede kan aanstel wat hulle wil hê en daar is, volgens my, slegs een rede daarvoor en dit is hulle kan betaal wat hulle wil.

Ons het al baie gehoor van stadsklerke se salarisse, dat dit vasgepen word deur die Administrateur, ens. maar by my bly die kern van die saak dat bestuur, as sulks, goed uitgeoefen kan word as jy die personeel het om dit mee te doen; en die enigste manier om daardie personeel te kry is nie om met die man mooi te praat oor die sekuriteit van werk in die

munisipaliteit nie maar wel in die vorm van die salaristjek wat hy by die einde van die maand ontvang.

Om verder te gaan : bl. 21 paragraaf 2.4 : "Ideally, top management should mainly carry out management work . . . In this respect Parrot distinguishes between the amateur and the professional manager. He finds it easy to locate an amateur by reference to the following characteristics :

> * He specialises in the work of his subordinates because that is the work that he knows best, better than management work; . . ." etc.

Referring to the Functional Chart of Roodepoort, Mr. Barnard queried the omission of Planning and Co-ordination and, in conclusion, he asked the question : „Indien hierdie bestuurswese sou funksioneer—teoreties en prakties—soos wat hy daar uiteengesit het, hoeveel addisionele personeel gaan nodig wees om daaraan uitvoering te gee?"

Met verwysing na die Funksionele Kaart van Roodepoort, wys mnr. Barnard op die weglating van Beplanning en Ko-ordinasie en ten slotte vra hy die vraag :—„ Indien hierdie bestuurswese sou funksioneer —teoreties en prakties—soos wat hy daar uiteengesit het, hoeveel addisionele personeel gaan nodig wees om daaraan uitvoering te gee?"

In his contribution, Mr. C. Lombard (Germiston) queried the practicability of target dates in the case of an Electricity Department in view of the many factors which may influence the completion of projects. He felt that more discretion should be given to the head of the department. He commented on the frustration of personnel who had acquired qualifications but could not always be suitably accommodated in senior posts. He asked Mr. du Toit whether he could suggest methods of overcoming this problem.

In sy bydrae bevraagteken mnr. C. Lombard (Germiston) die praktiese uitvoerbaarheid van doelwitdatums in die geval van 'n elektrisiteitsdepartement met die oog op die menigvuldige faktore wat die voltooiing van projekte kan beinvloed. Hy is die mening toegedaan dat daar meer diskresie aan die hoof van die departement gegee moet word. Hy lewer kommentaar oor die frustrasie van personeel wat kwalifikasies verwerf het, dog nie altyd op geskikte wyse in senior poste geplaas kan word nie. Hy vra of mnr. du Toit metodes aan die hand kan doen om hierdie probleem te oorbrug.

Mr. A. P. Burger (Johannesburg) said that in Johannesburg the Council had established a special sub-section of the Personnel Department with a view to Management Training. It was working outstandingly.

Mnr. A. P. Burger (Johannesburg) sê dat in Johannesburg die Raad 'n spesiale onderafdeling van die Personeeldepartement daargestel het met die oog op Bestuursopleiding. Dit werk uitstekend.

Summarising his thoughts, he said that the view in Johannesburg was that they accepted the need for Management Training but had doubts concerning the application in Local Government of Management by Objective (MBO) and programme budgetting and would appreciate Mr. du Toit's further comments on that point.

Ter opsomming van sy idees. sê hy dat die opvatting in Johannesburg is dat hulle die noodsaaklikheid vir Bestuursopleiding aanvaar, dog dat hulle twyfel oor die toepassing in plaaslike bestuur van Bestuur deur doelstelling en programberaming en dat hy mnr. du Toit se verdere opmerkings in verband hiermee sal waardeer.

At this stage the President introduced Mr. P. J. Botes, B.Sc. (Eng.), Pr.(Eng.), F.S.A.I.E.E. (Town Electrical and Mechanical Engineer, Roodepoort), who presented comments on his paper " Programming and Scheduling as Managament Aids with Special Reference to Municipal Electricity Undertakings," which was published in Volume 1(b) of the 1971 Proceedings. He indicated the following corrections to the published document :

In hierdie stadium stel die President aan die Konvensie voor mnr. P. J. Botes, B.Sc.(Ing.), Pr.(Ing.), G.S.A.I.E.I., en hy lewer kommentaar oor sy referaat „ Programmering en Skedulering as Bestuurshulpmiddels, met spesiale verwysing na Munisipale Elektrisiteitsondernemings " wat in Volume 1(b) van die 1971-verrigtinge gepubliseer is. Hy dui aan dat die volgende korreksies aan die gepubliseerde dokument aangebring moet word :

In Figuur 1 op bl. 6 vul asseblief die woorde „ Activity A/Aktiwiteit A" in bokant die lyn wat die tweede en derde mylpale verbind. Dit sal die beskrywing van hierdie mylpale in hierdie gebeurtenis verder in my referaat verduidelik.

The sentences in the middle of page 7 should read as follows :—

" Between milestones 0 and 2 in Figure 2

there are two activities which run parallel, the activities start at milestone 0 and end at milestone 2 :

Consequently the identification of the activity (0,2) is confusing.

" This problem can be eliminated by the use of a dummy activity as illustrated in Figure 3 :

The activities can now be identified as activities (0,2) and (0,3)."

In the middle of page 11 the formula for the variance should be sigma squared equals b − a over 6 **all** squared, and not (b − a) squared over 6 as it appears in the paper.

The President thanked Mr. Botes for his contribution and Mr. E. E. de Villiers (Rustenberg) introduced discussion on the paper. Mr. de Villiers referred to the importance in modern times for high quality administrative ability to be available to the technical head of a Municipal Electricity Department and for the utilisation of modern management techniques where these could be shown to be advantageous.

The President then invited discussion to proceed on both the papers of Mr. du Toit and Mr. Botes.

Councillor P. G. Joynt (Tzaneen) contributed to the discussion and referred to the importance of problems which were dealt with in the papers being discussed at conferences of Municipal Undertakings. Other contributors to the discussion were Mr. J. D. Weyers (Randfontein) and Mr. W. F. Cronje (Peri-Urban Areas).

Mr. A. H. L. Fortman (Boksburg) referred to the problems of forward planning which at times involved heavy capital expenditure for equipment in advance of immediate requirements.

Councillor E. Clurr (Pretoria) considered that long range planning should apply to cities of any size and the geographical economics as applied to the layout of cities and towns was most important. He advocated central planning committees to advise councils. He asked whether different municipalities would be prepared to take part in a financial analysis study as far as the production of electricity was concerned and offered the co-operation of Pretoria in this regard.

Turning to Mr. Botes' paper, he felt that some of the older programming methods had stood the test of time and could still be utilised with advantage. He also posed certain questions to Mr. Botes which the latter dealt with in his reply.

Mr. T. L. Swart (Glencoe), whilst stressing the importance of attention to detail, reminded the Con-

Die President bedank mnr. Botes vir sy bydrae en mnr. E. E. de Villiers (Rustenburg) lei die bespreking oor die referaat in. Mnr. de Villiers verwys na die belangrikheid daarvan dat in moderne tye administratiewe bekwaamheid van hoë gehalte vir die tegniese hoof van 'n munisipale elektrisiteitsdepartement beskikbaar moet wees en van die gebruik van moderne bestuurstegnieke waar hierdie tegnieke tot voordeel van die onderneming aangewend kan word.

Die President nooi hierna die Konvensie uit om die referate van sowel mnr. du Toit as mnr. Botes te bespreek.

Raadslid P. G. Joynt (Tzaneen) dra tot die bespreking by en verwys na die belangrikheid daarvan dat die probleme waarna in die referate verwys word, by die konferensies van munisipale ondernemings bespreek moet word.

Ander bydraers tot die bespreking is mnre. J. D. Weyers (Randfontein) en W. F. Cronje (Buitestedelike Gebiede).

Mnr. A. H. L. Fortman (Boksburg) verwys na die probleme van vooruitbeplanning wat by tye hoë kapitale uitgawes ten opsigte van toerusting wat nie onmiddellik benodig word nie, meebring.

Raadslid E. Clurr (Pretoria) spreek die mening uit dat langtermynbeplanning op stede wat enigsins groot is, van toepassing gemaak moet word en dat die geografiese ekonomie soos op die aanleg van stede en dorpe toegepas, van groot belang is. Hy lewer 'n pleidooi vir sentrale beplanningskomitees om rade van advies te bedien. Hy vra of verskillende munisipaliteite bereid sal wees om aan 'n finansiële analise-studie van die produksie van elektrisiteit deel te neem en bied die samewerking van Pretoria in hierdie verband aan.

Met verwysing na mnr. Botes se referaat is hy die mening toegedaan dat sekere van die ouer programmeringsmetodes die toets van die tyd deurstaan het en nog met voordeel toegepas kan word. Hy stel ook sekere vrae aan mnr. Botes, wat laasgenoemde in sy antwoord behandel.

Mnr. T. L. Swart (Glencoe) lê klem op die belangrikheid van aandag aan detail, dog wys die

vention that one must be on the alert not to allow over attention to detail to detract from the main objectives.

Mr. J. J. Barrie (Johannesburg) referred to the danger of limiting the opportunity of the individual to a narrow sphere with consequent probability of job frustration. He reminded listeners that for satisfaction it was essential for the individual to see what he is doing and what he is getting at.

Mr. E. Trautman (Ladysmith) asked whether co-ordination with the civil engineering department had been tried.

Mr. H. Barnard (Brakpan) referred to the importance of competition as an incentive towards greater productivity.

konvensie daarop dat 'n mens in jou pasoppens moet wees om nie toe te laat dat te veel aandag aan detail afbreuk doen aan die hoofdoelstellinge nie.

Mnr. J. J. Barrie (Johannesburg) verwys na die gevaar dat die geleenthede vir die indiwidu tot 'n enge vlak vernou word, met die gevolglike waarskynlikheid van taakfrustrasie.

Hy herinner luisteraars daaraan dat, teneinde tevredenheid te bewerkstellig, dit vir die indiwidu noodsaaklik is om te sien wat hy doen en waarheen hy beweeg.

Mnr. E. Trautman (Ladysmith) vra of daar al probeer is om met die siviele ingenieurswesedepartement te ko-ordineer.

Mnr. H. Barnard (Brakpan) verwys na die belangrikheid van kompetisie as 'n aansporingsmiddel tot groter produktiwiteit.

2nd Day, AFTERNOON SESSION

The Convention proceeded to consider reports, all of which were published in Vol. 1(a) of the 1971 Proceedings.

Electrical Wiremen's Registration Board :

Mr. J. von Ahlften (Representative). The contribution by Mr. J. G. Wannenburg, Chief Inspector of Factories, Department of Labour, Pretoria, appears in Vol 2(a) of the 1971 Proceedings.

Report of the Recommendations Committee for New Electrical Commodities—Mr. R. W. Barton, Convener) :

Expanding on his report, Mr. Barton said that its short, factual nature gave no idea of the amount of work which this committee puts in. He paid tribute to the members of the committee, to the South African Bureau of Standards and to the Secretaries, especially Miss Brewin, for their contributions towards the operation of the committee.

Report on the World Energy Conference—Mr. R. W. Barton (Representative) :

No comment.

Report on the South African National Committee on Illumination Congress 1970.—Mr. R. W. Barton (Representative) .

Adding to his report, Mr. Barton said :

2de Dag, NAMIDDAGSITTING

Die Konvensie gaan voort om verslae, wat almal in Vol. 1(a) van die 1971-verrigtinge gepubliseer is, te oorweeg.

Registrasieraad vir Elektrotegniese Draadwerkers :

Mnr. J. von Ahlften (Verteenwoordiger). Die bydrae van mnr. J. G. Wannenburg, Hoof-Inspekteur van Fabrieke, Departement Arbeid, Pretoria, verskyn in Volume 2(a) van die 1971-verrigtinge.

Verslag van die Komitee vir Aanbevelings Insake Nuwe Elektriese ware—Mnr. R. W. Barton (Sameroeper) :

Ter uitbreiding van sy verslag, sê mnr. Barton dat die kort, feitelike aard van die verslag geen idee gee van die hoeveelheid werk wat hierdie Komitee doen nie. Hy bring hulde aan die lede van die Komitee, aan die Suid-Afrikaanse Buro vir Standaarde en aan die Sekretariaat, veral mej. Brewin, vir hul bydraes tot die suksesvolle funksionering van die Komitee.

Verslag oor die Wêreldkongres Insake Energie.—Mnr. R. W. Barton (Verteenwoordiger).

Geen kommentaar.

Verslag oor die 1970-Kongres van die S.A. Nasionale Komitee Insake Verligting—Mnr. R. W. Barton (Verteenwoordiger) .

Ter aanvulling van sy verslag sê mnr. Barton :

We had a session at the last SANCI Convention at which we discussed light fittings, particularly street lighting fittings manufactured in this country, and there was a general consensus between manufacturers,

suppliers and users that it would be a very good thing if the Bureau were to prepare a specification to cover these particular articles. People have had various difficulties; questions of uniformity and performance, construction, quality and so forth have arisen. There was a unanimous decision that SANCI should approach the AMEU to ask them to process this idea. In other words, if the AMEU agrees, would they then approach the Bureau for the preparation of this specification.

With the unanimous agreement of the convention, this matter was referred to the Executive Council for decision and communication with the Bureau of Standards.

Met die eenparige steun van die Konvensie word hierdie saak na die Uitvoerende Raad verwys vir 'n besluit en vir kommunikasie met die Buro vir Standaarde.

Report on the Revision of the Standard Regulations for the Wiring of Premises.—Mr. E. E. de Villiers (Representative):

Commenting on this report, Mr. A. A. Middlecote (S.A.B.S. Pretoria) referred to the likelihood that progress with the local wiring regulations will have to wait on the progress of international work.

Verslag oor die Hersiening van die Standaardregulasies vir die Bedrading van Persele.—Mnr. E. E. de Villiers (Verteenwoordiger).

In sy kommentaar oor hierdie verslag verwys mnr. A. A. Middlecote (S.A.B.S. Pretoria) na die waarskynlikheid daarvan dat vordering met die plaaslike bedradingsregulasies sal moet wag vir vordering ten opsigte van internasionale werksaamhede.

Report on the S.A. Electrolytic Corrosion Main Committee.—Mr. D. C. Plowden (Representative).

No comment.

Verslag oor die S.A. Hoofkomitee Insake Elektrolitiese Verwering.—Mnr. D. C. Plowden (Verteenwoordiger).

Geen kommentaar.

Report on the Co-ordinating Committee for High Voltage Research Facilities.—Mr. D. C. Plowden (Representative).

Mr. Plowden said:

There was a meeting held of this Committee on 8th October which will be reported more fully on another occasion. But a decision was taken at this Committee that its next meeting which is to be held about April or May, will be held in Cape Town.

Verslag oor die Ko-ordinerende Komitee vir Hoogspanningsnavorsingsgeriewe.—Mnr. D. C. Plowden (Verteenwoordiger).

Mnr. Plowden sê:

At the meeting on 22nd April the Bureau set up a Working Group on external installation and pollution and I just wanted to mention that this Association's Representative is a member of that Working Committee.

Report on Common Service Facilities.—Mr. G. C. Theron (Convener).

Introducing Mr. A. F. W. H. Eggers (Department of Posts and Telegraphs, Pretoria), Mr. G. C. Theron thanked Messrs Frantz and Simpson for their guidance on the sub-committee. He added that the Code of Practice which had been prepared and was now available is to be regarded as a **guide** as to what procedure can be followed, and to be utilised by engineers in collaboration with the Post Office authorities.

Verslag oor Gemeenskaplike Diensgeriewe.—Mnr. G. C. Theron (Sameroeper).

Toe hy mnr. A. F. W. H. Eggers (Departement van Pos- en Telegraafwese, Pretoria) aan die Konvensie voorstel, bedank mnr. G. C. Theron mnre. Frantz en Simpson vir hul leiding in die Subkomitee. Hy voeg by dat die gebruikskode wat voorberei is en wat nou beskikbaar is, beskou moet word as 'n **gids** met betrekking tot welke prosedure gevolg kan word, en wat deur ingenieurs in samewerking met die Poskantoorowerhede gebruik moet word.

Mr. Eggers said:

First of all, I would like to thank Mr. Theron, Mr. Simpson and Mr. Frantz very much indeed for their cooperation and the fine spirit in which we were able to discuss this matter.

Mnr. Eggers sê:

The draft Code of Practice included in the brochure which I think was made available to everybody here, is a first attempt, I would say, at reaching some basis on which we can get power and telephone

cables installed simultaneously; thereby obtaining economic benefits for both local authorities and the Post Office in so far that the costs of trenching, particularly, and the labour which is employed on that work is exploited to the full, instead of separate work being undertaken by local authorities and the Post Office in the same area.

There are one or two points as regards the present book that I think I should mention particularly. First of all there is the suggested division of trenching costs (paragraph 3.4) and the table which appears thereunder: this was based on rational thinking as to how this could best be arranged but it appears from more recent experience that there are cases where we might find, on the Post Office side, that we would have to withdraw from such an arrangement because of extremely high trenching costs; particularly in those cases where contractors are employed, possibly by local authorities themselves, or via consulting engineers.

I don't know what the entire answer is here but I visualise that in these cases this may have to be negotiated in each individual case.

As far as paragraph 4.2 is concerned, mention is made that the requirements are included in the Standard Regulations for the Wiring of Premises. This is a little premature as it is not so at the moment. We have raised the matter with the Committee responsible for the Wiring Regulations and hope that some means will be found of including these requirements in these Standard Wiring Regulations.

The thought behind this is really more a question of making information available or rather drawing the attention of contractors to these requirements to ensure that they're not overlooked. It would be rather a pity if, in a particular instance, arrangements had been made and everybody had carried out the plans up to the point where the installation on private property had to be undertaken, only to discover that the contractor has forgotten to install the pipe at the same time as the power cable, to be used for the installation of a telephone service at a later date.

Finally, under 4.3 mention is made of an amendment of the Post Office Act which would be necessary in order to enable municipalities to reimburse themselves the cost of a pipe which would be installed on private property, by including this in the connection fee or making some other arrangement via the contractors. This amendment has not yet become fact; it is a proposal which we hope will be passed through Parliament in due course.

Mr. A. C. T. Frantz (Cape Town) asked permission to raise a related matter, viz., a proposal received from the Cape Provincial Administration in connection with common services for television aerials. By way of explanation, the President confirmed that this matter was being taken care of by the Bureau of Standards and that the A.M.E.U. were represented on the relative committee.

Mnr. A. C. T. Frantz (Kaapstad) vra toestemming om 'n aanverwante saak te opper, naamlik 'n voorstel wat van die Kaaplandse Provinsiale Administrasie ontvang is in verband met gemeenskaplike dienste ten opsigte van beeldradio-antennas. Ter verduideliking sê hy dat hierdie saak deur die Buro van Standaarde onder hande geneem is en dat die V.M.E.O. in die betrokke Komitee verteenwoordig is.

Report on the C.S.I.R. Advisory Committee for Electrical Engineering.—Mr. G. C. Theron (Representative).

Mr. J. D. N. van Wyk (C.S.I.R., Pretoria) commented as follows :

Verslag oor die W.N.N.R. se Advieskomitee Insake Elektrotegniese Ingenieurswese.—Mnr. G. C. Theron (Verteenwoordiger).

Mnr. J. D. N. van Wyk (W.N.N.R. Pretoria) lewer soos volg kommentaar :

Laat my toe eerstens om namens die W.N.N.R. vir u baie geluk te wens met u verkiesing tot hierdie hoë amp en ons wil u ook alles van die beste toewens vir die twee jaar wat u gaan dien.

Dan wil ek graag net 'n paar algemene aanmerkings maak : Firstly, I think it would perhaps be interesting to delegates to know what the purpose of this Advisory Committee of ours is. The Committee is really there to make sure that we keep in close contact with what is going on in industry. Projects on our research programme appear there in two ways: they are either contract projects which come to us from a sponsor who then pays for the work and is at liberty to do as he pleases with the results; or else we use the Government grant which we get to do more long-term research. Although this is normally of a more basic nature it is aimed at assisting industry by looking into problems which are common to industry as a whole.

Naturally we try to identify these problem areas and this is really where the Advisory Committee comes in and I would stress here the importance of keeping your representative informed about such problems so that he can bring them to our notice and so that we can take this into account when we plan our long-term research projects.

I would like also to point out that you don't necessarily have to keep to the power engineering field

as we are also doing work in the light current field and, for example, in the field of automation; solid state electronics, where we deal with semi-conductors (and everybody has to deal with semi-conductors in the power engineering field today); and micro-circuits. In fact, we have an Electronics Instrumentation Group. So I would like any of those members who can to bring any problem areas in any of these fields to our notice.

In fact, I would invite each and everyone of you, if you have a problem or you need some information, to come and see us or write to us about it. We don't know all the answers—if we did we would be out of business!—but we do come into contact with a lot of literature and information in our programme and we would be very pleased to assist you as much as we can.

Mr. President, just allow me to remark on two items appearing under these two reports: the first is the High Voltage Co-ordinating Committee Item 7. I think, in fairness to the Co-ordinators, I should amplify that particular paragraph. They did not really advise that the C.S.I.R. should **not** get high voltage facilities; they simply said that any facilities which we establish should **augment** the facilities which will be available at ESCOM and at the Bureau of Standards. This is also our intention.

However, research—particularly applied research—has become a business today and you have to do it on a very tight schedule and planned programme so that a certain amount of duplication is inevitable because you cannot have the research man standing around waiting for some free time on somebody else's facility.

Nevertheless, we feel this Co-ordinating Committee is fulfilling a very vital role in at least bringing people together in this field and I think, with the lack of manpower that we've got, it is almost axiomatic that duplication is kept to a minimum.

As regards the reference here to the C.I.G.R.E. working group, I should like to comment that I think the correct reference is Committee No. 33 which deals with over-voltage and insulation co-ordination. Mr. Anderson is the Chairman of the working group of that Committee en hy sal miskien ook iets wil byvoeg.

Kan ek net vir u baie dankie sê vir die geleentheid wat ons altyd kry om saam met u hier te wees. Ons waardeer dit baie want dit gee vir ons werklik 'n insig in die probleme wat u in die praktyk het en dit is vir ons van baie groot waarde om seker te maak dat ons nie in afsondering werk nie.

Mr. R. B. Anderson (C.S.I.R., Pretoria) contributed as follows :

First of all, thank you very much for your kind invitation here. I think we come here for many reasons, one of the most important being, as far as I'm concerned, getting closely in touch with people operating your systems, and learning at first-hand the problems with which you are faced. I myself have had some experience with the Electricity Supply Industry and feel that I can understand a lot of these problems but I think it much better to have the concerted opinion of people and to hear from this Organisation where the real problem areas lie; and I'm grateful indeed for the opportunity of coming here to do just that.

I thought it might be helpful to amplify very briefly the work we are doing at the moment in the power electrical engineering division. In connection with C.I.G.R.E. we are participating in a programme of developing lightning flash counters. As you know, our lightning in this country varies from a few thunderstorm days to nearly 100 or so in the Transvaal and it is a question of how we should grade our transmission systems and our lightning protection systems as from one part of the country to the other. As we all know, the thunderstorm day is not a reliable means of grading; it's not proportional to the lightning flash density and, in common with the rest of the world, an intrument is being sought which will measure the

Mnr. R. B. Anderson (W.:N.N.R. Pretoria) lewer die volgende bydrae :

actual lightning density to ground, on which we can then base all our comparisons, not only in our own country but with other parts of the world.

We are participating in that and developing this counter and we hope that when (in the not too distant future) a counter is available for general use, that your Organisation and municipalities will participate in using counters to obtain the data which we will then need in order to find out this parameter for South Africa.

You might also be interested to hear that one of the members of the working group reported the use of these counters as a warning system for an electricity supply system: this particularly in Japan where the counters are being used throughout the undertaking and information is being fed back to the control centre from the counters so that control does know where the lightning storms are and can alert their operating staff to stand by for emergency operations. I don't think we've reached that stage yet but that is one of the purposes for which it is being used.

Another interesting fact to come out of a C.I.G.R.E. meeting is that the working group was able to produce a new current distribution curve for lightning. Those of you who've had anything to do with line design, lightning protection, will realise how useful this is and this information is based on lightning

currents to tall chimneys.

In this respect we suspect that lightning in South Africa might be more severe in many respects than that from which these measurements were made and it is our intention at the CSIR to try and get some more information on this. If, in fact, it is more severe then we will have to take more steps than they do overseas.

Another side we are tackling is insulation: the evaluating of insulating materials. We have a fully qualified man on this job (M.Sc.) who has all the equipment at his disposal and can undertake long-term and short-term evaluation of insulation. We've been able to assist industries in some troubles with insulation that they've had and we hope that this service will become more widely available.

Part of this service is the prediction of the life of insulation in machines and possibly cables at a later stage, by measurement. We hope to find the most sensitive measurements for these machines that will indicate when the life is being shortened. But more important perhaps, is the evaluation of the materials that are used in the manufacture of equipment, particularly in the rewinding of motors.

We have also been doing work on earthing although we are now awaiting more definite proposals from Mr. Middlecote's working group on earthing.

Work has also now been started on the application of semi-conductors to the control of rotating machines. Control by this means, as you know, is something which is very much in the modern world of machine operation. We have somebody there who can look into these problems and, in that connection, we would also be pleased to know what troubles are being experienced with these control systems at the present time.

The President thanked Messrs van Wyk and Anderson for their enlightening reports on the activities of the C.S.I.R.

Die President bedank mnre. van Wyk en Anderson vir hul insiggewende verslae oor die werksaamhede van die W.N.N.R.

The proceedings of the Convention were interrupted by the President who reported that he had received the distressing news of the sudden passing of Mr. C. F. Hafele, formerly City Electrical Engineer of Bloemfontein. The Convention stood in silence in memory of Mr. Hafele.

Die verrigtinge van die Konvensie word deur die President onderbreek met 'n aankondiging dat hy die treurige nuus van die skielike oorlye van mnr. C. F. Hafele, voorheen Elektrotegniese Stadsingenieur van Bloemfontein, ontvang het. Die Konvensie aanvaar staande en in stilte 'n mosie van roubeklag met mnr. Hafele se heengaan.

Report on the Standing Advisory Committee on Electrical Safety.—Mr. G. C. Theron (Representative).

Verslag van die Vaste Advieskomitee Insake Elektriese Veiligheid.—Mnr. G. C. Theron (Verteenwoordiger).

Report on the South African Bureau of Standards.—Mr. G. C. Theron (Co-ordinating Representative).

Verslag oor die Suid-Afrikaanse Buro vir Standaarde.—Mnr. G. C. Theron (Ko-ordinerende Verteenwoordiger).

Expanding on his report, Mr. Theron said:

Ter aanvulling van sy verslag sê mnr. Theron:

Mnr. die President, met u toestemming sal ek graag dié twee verslae gelyktydig wil hanteer aangesien beide van hulle baie nou gekoppel is aan die werksaamhede van die Buro van Standaarde en mnr. Middlecote ook hier is om vir ons in hierdie verband verder toe te spreek.

Ek wil net graag uitwys, mnr. die President, onder die Veiligheidskomitee is daar die Komitee van die I.E.K. nr. TC 61. Die Komitee neem geweldige groot afmetings aan en is sekerlik een van die belangrikstes waarmee die Buro van Standaarde en die VMEO huidig te doen het.

Dan onder die verslag van die Buro van Standaarde wil ek niks byvoeg nie behalwe om al die verteenwoordigers van die VMEO op die verskillende sub-komitees baie hartlik te bedank vir hulle ondersteuning, hulle gewilligheid om die las op hulle te neem, en ook vir hulle Rade wat dit vir hulle moontlik gemaak het om die Vereniging op hierdie subkomitees te verteenwoordig. Ek kan u verseker, mnr. die President, hulle doen 'n geweldige groot werk, 'n baie belangrike werk, want die resultate daarvan word uiteindelik standaardspesifikasies wat met die moderne bestuurstegnieke die werk van ons ingenieurs almal weer baie makliker maak as dit behoorlik toegepas word.

The President said:

Die President sê:

Mnr. Theron, ons wil ook net die dank van die Kongres aan u oordra vir die werk wat u gedoen het toe u die Kongres in Brussel bygewoon het van die Internasionale Elektrotegniese Kommissie. Ons is besonder bly dat dit die eerste keer was dat hierdie Vereniging daar verteenwoordig was en dit is sekerlik van waarde gewees vir ons Vereniging dat ons dit ook in die toekoms sal opvolg. Ons sê aan u baie dankie dat u die tyd opgeoffer het om namens ons Vereniging daar teenwoordig te wees.

Joining the discussion, Mr. A. C. T. Frantz (Cape Town) said that his department was disturbed at the trend in standard specifications with particular reference to those for transformers.

Toe hy tot die bespreking toetree, sê mnr. A. C. T. Frantz (Kaapstad) dat sy departement bekommerd is oor die jongste neiginge met betrekking tot Standaardspesifikasies, met spesiale verwysing na dié vir transformators.

Mr. Frantz said :

Mnr. Frantz sê :

We have heard that the Bureau will be standardising on distribution transformers without tapping switch, no oil-drain valve too small to facilitate oil circulation for filtering, no valve between the main tank and the conservator tank, etc., in order to cheapen the design.

Apparently on this Committee the AMEU is represented by one man whereas the transformer manufacturers are all individually represented and they, of course, outvote us every time.

Although they assure us that if we're dissatisfied we can specify our own specification such as a bigger valve, an oil conservator with a valve, the trouble is that when big consumers like blocks of flats or business houses have to provide their own transformer they will buy one to SABS specification only to find that they've got the wrong voltage because they use no tapping switch; when the oil has to be filtered it can't be filtered and that sort of thing.

I'm wondering whether we can't do something about getting the Constitution of this Committee altered so that we can have more votes on it in relation to the transformer manufacturers.

Mr. A. A. Middlecote (S.A.B.S., Pretoria) responded :

Mnr. A. A. Middlecote (S.A.B.S. Pretoria) antwoord :

First of all, there's no such thing as having a vote on a technical committee meeting. It has never been so. The sincere aim and object is to get accord without which you've failed in your object.

Briefly, if you're an efficient chairman you classify the members of a committee into the various classes of consumer, manufacturer, user, independent scientific individuals in certain cases, commercial representatives, etc. Each has an interest: the commercial man is interested in simplification because he doesn't want to carry too much in stock; the manufacturer wants long production runs; the consumer wants an efficient, reasonably priced article. You yourselves have stressed that in order to obtain a low cost per unit one of the methods used is to intelligently apply standardisation.

I can assure Mr. Frantz, however, that he has probably heard this the wrong way round: no vote is taken regardless of whether there're 6, 7 or 8 manufacturers there and only 1 AMEU representative. If the AMEU man stands solidly against it, particularly if he's backed by say ESCOM or another user interest, I'm sure the matter would not go through.

Since I am no longer the Chairman I can't speak with any authority on all the points he's quoted but I will say this that the matter of leaving out a tapping switch didn't arise from the manufacturers; the lead, I'm almost certain, came from a municipal engineer and there are certain municipalities that are very strong on this point.

I'm not going to put the case for one or the other. All I can say is that, as usual, there would be pros and cons and it is the task of the Committee to look at this dispassionately and even, I would say, patriotically. To wax sentimental for a moment, we live in a country, which consists of a whole and the whole consists of parts, the parts being the manufacturers, consumers, retailers and so on. They act and react upon each other and eventually produce something that's good for the country; they produce a pattern of development that's in the best interests of the country as a whole.

If, however, a manufacturer is small-minded enough to believe that something which appears to be to his immediate benefit might not possibly redound to the whole economic set-up of the country, he might do damage. Likewise, the municipal engineer must ask himself whether there is any virtue in a particular thing or whether, as a whole, it helps the country in its economic advance.

I can quote a very good example in the British Electrical Industry. They now admit to tremendous

losses many years ago when the greatest setback to Britain's export trade in electrical engineering apparatus was caused by the unnecessarily high, finicky standard set up by the C.E.G.B. They insisted on particular little items which they felt were good quality, good practice, but which priced the British article out of the international market, for which they paid a terrific price which they only now admit to. They have now appealed to their Electricity Supply Industry to look upon this rationally to decide what is in the best interests of the country.

This is the aim and object of a technical committee, which is why we appeal to you to send your very best men there with positive ideas and with a consolidated opinion of the AMEU. We try to follow this and I would remind Mr. Frantz, in all fairness, that because we feared this might not be the case, we even had a special meeting in Cape Town to which we invited the representatives of municipalities in the Cape and ESCOM and, as far as I understood, they seemed to be satisfied with these requirements.

Actually this spec isn't complete so let's just compromise and say that we've accepted Mr. Frantz's warning but would the AMEU now give us their genuine feelings on this subject. They won't be outvoted.

I admit we probably will change the set-up. The development of a technical committee sometimes is historical in that at the beginning you want representatives so you start by inviting individual, industrial firms because you know you'll get enthusiastic contributions from each of these as very interested members. But, of course, in a mature economy one should appeal to organised industry and one should ask S.E.I.F.S.A. to nominate two manufacturers to represent the whole of the manufacturing industry. This, incidentally, is our present policy and with new projects we prefer to do it that way.

Whatever happens, though, numbers don't count; it's the sector that counts: and if the whole of the consumer sector is violently opposed to something it would be foolish for us to try and push it through. People just wouldn't work to our specs and, you know, the acceptance of our specifications is completely voluntary. I hope that answers that question.

Mr. A. C. T. Frantz (Cape Town) indicated that he still felt that the A.M.E.U. representation was insufficient. In reply, Mr. Middlecote said that no opinion would ever be neglected but cautioned the A.M.E.U.:

Mnr. A. C. T. Frantz (Kaapstad) sê dat hy nog van mening is dat die V.M.E.O. se verteenwoordiging onvoldoende is. In antwoord hierop sê mnr. Middlecote dat geen mening ooit geïgnoreer sal word nie, dog waarsku die V.M.E.O.:

If you send a representative there who keeps quiet then you have only yourselves to blame.

Mr. A. H. L. Fortman (Boksburg) advised that the Highveld Branch had been asked by the A.M.E.U. representative on this committee for comment on the issue of tap switches. The outcome of discussion was minuted as follows:

Mnr. A. H. L. Fortman (Boksburg) sê dat die Hoëveldse Tak deur die V.M.E.O.-verteenwoordiger in hierdie Komitee versoek is om oor die kwessie van tapskakelaars kommentaar te lewer. Die uitslag van die bespreking is soos volg genotuleer:

Die Vereniging besluit dat die Komitee versoek word om die tapverbindings te laat soos in die huidige spesifikasie uiteengesit.

The President then introduced the topic of **"Standard Voltages"** as appearing on the last page of Vol. 1(a) of the 1971 Proceedings. He drew attention to a printing error in that the asterisks at the end should be reversed.

Die President lê hierop die onderwerp „Standaardspannings," soos op die laaste bladsy van Volume 1(a) van die 1971-verrigtinge gepubliseer, vir bespreking voor. Hy vestig die aandag op 'n drukfout, naamlik dat die sterretjies aan die einde, omgeruil moet word.

Mr. A. A. Middlecote (Pretoria) introduced discussion and said:

Mnr. A. A. Middlecote (Pretoria) lei die bespreking in en sê:

This is something we've been evading for years. We are in a situation (in common with much of the rest of the world) where we have something like four so-called standard low voltages 200, 220, 230, 240 and 250. Now this is extremely unhealthy. In fact, if you go back to the origins of the I.E.C. you will discover that it was set up primarily to try and standardise voltages and currents. It's done a great deal of work

but, certainly in South Africa, it hasn't succeeded in standardising low voltages.

One can only accept this as historical again but it is a disadvantage as it means that any local manufacturer has either got to design liberally (which isn't usually economical) for a wide band of voltages so that the machine or appliance will operate on anything from 220V to 250V, involving additional cost which is bad in a competitive world; or else he has to make four different windings or some such arrangement. This means he suffers a disadvantage.

One can, of course, adopt the age-old attitude of letting matters take their course and getting down to it in the future but at the present rate of expansion of our economy, every 10 years (perhaps more like 8 or 9 years) the job becomes twice as hard. In other words, you have twice as much apparatus to change in 8 or 10 years time as you have now. The sooner then that one gets down to this, the better for the country.

In certain municipalities it would be at a disadvantage but personally I think if one accepted a standard voltage and then the AMEU perhaps, appointed a study committee to go into ways and means on a planned basis, of gradually programming those out of step towards coming into step, it would be doing an extremely good job for the country.

So I put it to you to look at and to see if it's worth your while adding your strength to this step of doing what we should have done already because the Electricity Act states we are 220V and this is, therefore, something we should work on.

On the proposal of the President, it was agreed that this matter be referred to the Executive Council for action.

Op 'n wenk van die Voorsitter word daar ooreengekom dat hierdie saak na die Uitvoerende Komitee verwys word vir verdere optrede.

Arising from the report, Mr. J. C. Waddy (Pietermaritzburg) said :

Voortvloeiende uit die verslag, sê mnr. J. C. Waddy (Pietermaritzburg) :

Recently in Natal the Bureau of Standards has been active in endeavouring to persuade municipalities to prohibit the installation of water heaters that don't bear the SABS mark. No doubt if they have this mark they are superior but when it comes to prohibiting the sale of those units not bearing the mark, I'm not sure we're on firm ground.

I've been told that most municipalities in the country do, in fact, prohibit the installation of the non mark-bearing water heaters but surely if the Bureau feels that the sale of these latter should be prohibited, there should then be a compulsory specification for them. I'd be interested to hear what Mr. Middlecote has to say about it.

In reply to Mr. Waddy, Mr Middlecote advised as follows :

In antwoord op mnr. Waddy, deel mnr. Middlecote die Konvensie soos volg mee :

As far as compulsory specifications are concerned I must remind you we're a very democratic country and the Minister has to declare this a compulsory specification, not the Bureau; and the Minister will not consider declaring any specification compulsory unless it is a hazard to life or limb. This is really why we have not attempted to make the installation of hot water cylinders bearing the mark compulsory. It's merely a matter of choice in each individual municipality.

I don't know of any marked approach as such to the consumer apart from general guidance. The safety aspects are one thing but if one takes the standing loss, it would, in fact, cost the purchaser more than the difference in price between a lower quality cylinder and the one bearing our mark, due to increased losses. Even a 50 watt heat loss over and above specification adds up to quite a few cents per year.

The real motivation then is the protection of the consumer; to make sure he's getting his money's worth. It also, in certain small municipalities, does result in a decrease in the peak. It's probably not of moment in big municipalities and it is certainly not grounds for national compulsion: it's merely looking after consumer interests and making sure that the buyer gets good value for money.

The President next invited Messrs Botes and Du Toit to answer the various questions raised on their papers.

Hierop versoek die President mnre. Botes en du Toit om op die verskillende vrae wat omtrent hul referate gevra is, te antwoord.

Mr. P. J. Botes (Roodepoort) said :

Mnr. P. J. Botes (Roodepoort) sê :

Mnr. de Villiers, ek wil u baie bedank vir die woorde wat u gerig het in verband met my referaat. Mens strewe natuurlik altyd na optimum werkverrigting en om dit te probeer bereik is daar 'n paar basiese dinge wat 'n mens moet doen. Jy moet eerstens tevredenheid by jou werkers daar stel want 'n ontevrede werker is 'n verpesting van die hele departement. Mens moet hom tevrede stel en ingaan op sy probleme, sy huislike probleme, want as hoof van 'n departement is jy ook vader van almal wat daar is.

Dan moet 'n mens ook natuurlik die basiese opleiding daarstel. Persone moet opgelei word om die werk te doen en nie net gesê word om aan te gaan daarmee nie. Hy moet behoorlik opgelei word en 'n mens moet 'n algemene goeie en gesonde toestand daarstel vir die verkryging van werkverrigting.

In verband met O. en M. kan ek dit sò stel dat dit my nie meer kan boelie nie want ek kan hulle taal praat en dit vir my persoonlik van baie groot waarde.

Sover dit die koste van PERT betref moet mens maar natuurlik opweg wat die koste daaraan verbonde is. Klein projekte moet 'n mens nie met PERT aanvang nie; dis nie nodig nie, maar komplekse skemas waar daar R500 000 of 'n miljoen of iets op die spel is, is dit van uiters te waarde en is die koste van PERT minimaal.

Dan is daar die bate wat 'n mens daaruit kry. Dit kan ek die beste illustreer uit my eie ondervinding onlangs. Dit het gebeur by die afhandeling van 'n groot taak—die inwerkstelling van 'n spanningsverlaging-substasie—en ek het die werkers beloof dat ons 'n groot party gaan hou dié dag met die Burgemeester, die Stadsklerk en almal teenwoordig en alles moet net reg en goed geskied. Ter elfder ure is daar 'n paar dingetjies wat hier en daar gedoen moet word; 'n boompie plant, die sypaadjie regmaak, ens. Eers later vra ek toe vir my Assistant of hy bewus was daarvan dat hy die kostes daardeur buite alle verhouding laat opstoot het. Ek reken dit het minstens R1 000 per dag gekos met al die ploegbase, implemente en mense wat hy daar gehad het.

Dit is juis wat PERT probeer doen: om die goed betyds te doen en om die taak so spoedig moontlik af te handel sodat die koste beperk kon word.

U weet dit is die geval as u 'n pos ooplaat. Daar is die ou storie van die poskantoor posnommer wat hulle oopgemaak het om 'n paar boeke te koop van R50. Maar niemand het toegesien dat die pos weer gesluit word nie en na twee jaar was daar R2 000-00 teen daardie pos gedebiteer !

Hoe gouer jy dan jou taak afhandel hoe minder is daar kanse dat daar oorbesteding kan plaasvind. Ek het nog nie persoonlik ingegaan op wat dit my spaar nie; ek het nie die spesifieke voorbeelde nie maar ek noem dit net.

Aan Raadslid Joynt van Tzaneen wil ek dankie sê vir woorde. Soos ek reeds genoem het voel ek dat PERT-netwerke net daargestel kan word met groot projekte. Wat kleiner projekte aangaan in Ghanttkaarte en Baars-kaarte voldoende. Ek het nie ondervinding daarvan nie maar ek dink dat waar dorpe van konsulterendeingenieurs gebruik maak kan hulle gevra word om met hulle verslae 'n PERT-diagram in te dien; of met die tenders wat aangevra is ook daarmee 'n PERT-program in te dien.

Ek stem saam dat gekwalifiseerde manne baie skaars is. Ons adverteer al vir ses maande vir ingenieurs en kry geen aansoeke nie. Ons stel dus ingenieurs-assistente met beperkte kwalifikasies en ondervinding aan om sekere tipe werke, wat hulle bevoeg is om te doen, te kan verrig.Verder lei ons op die oomblik op twee persone as tegnici en ook twee wat ons op die Universiteit van Pretoria het wat hulle bekwaam as elektrotegniese ingenieurs. Hierdie persone word natuurlik verbind vir 'n aantal jare na hulle studies, om by die Roodepoort se Munisipaliteit te werk.

In verband met die probleme met personeel wat mnr. Weyers genoem het: daarmee het ons geen probleme in Roodepoort nie behalwe die tekort aan ingenieurs. Eintlik het ons 'n waglys vir vakmanne daar.

Mnr. Weyers is daar weg toe en nog in die beginstadium van PERT was en ek kan net aan hom noem dat ek gevind het dat by groot werke dit noodsaaklik is om die voorman aan te stel om in beheer te wees of toe te sien op die PERT-program nie, aangesien by besig is met 10 of 12 verskillende ander werke soos ek reeds na verwys het. Ek verkies dus om iemand daar te stel, soos byvoorbeeld 'n ingenieurs-assistent wat ons nou in gebruik het, om daardie werk te doen.

As regards the comments of Mr. Fortman of Boksburg: Mr. Fortman, we shouldn't break down a job into elements as one can only go so far and no farther. In jointing, for instance, you can explain in great detail what must be done but if your programme is in days, obviously you can't stipulate that a joint be done per day. Actually, this isn't your job at all; it's the workman's job. He knows about it and therefore he should do it.

There are quite a few programmes on display for you to look at. In the reticulation of townships what I've done is to divide the township into three specific zones and then PERT-ed the zones. In other words, all cable jointing done in that zone is specified "Cable Jointing." It may take 2, 4, 5 or 6 days, depending upon the amount of work, but you can't specify that in detail.

When it comes to major, complex schemes, I drew up one of an installation of a 0,5 sq. in. cable. It worked out pretty well, as I mentioned in my paper, but for the fact that the contractors didn't stick to their part of the contract. If you care to look at the diagram on display you will see there that I've given

times for the various joints to be done. This is, of course, on a 33kV scheme where they take one or two days to complete a joint—or three days, in some instances. So one can't break down everything into elements.

Councillor Clurr, Ghantt charts are most essential but only on smaller projects. I use them a lot myself but when it comes to complex schemes, major schemes of the order of R200-, R300-, R400 000, then I prefer the PERT diagram.

In answer to your specific query as to the ownership of the property I mentioned: it was Council property!

Regarding a cost-integrated programme, I haven't done one as yet but I intend to do one on this new Kloofendal extension.

With regards to Mr. Trautman's comments, I just want to point out that there are quite a few diagrams on the table involving all departments of the Council.

In verband met mnr. Barnard se navraag wil ek net noem dat, alhoewel ek my bes probeer het om soveel as moontlik weer te gee in my referaat, ek dink dis baie beter, as u 'n PERT-program wil opstel, om van die boeke in die bibliografie wat ek genoem het, 'n paar aan te skaf om meer in verband met die tegniek uit te vind.

Wat motivering betref, moet 'n mens maar baie tyd daaraan spandeer, maar ek dink dit werp die nodige vrugste af.

Nou, in verband met sy kommentaar oor my skema wat ek verwerp en die bestuur kortgeskied het, wil ek net noem dat ek daardie skema meer as vyf jaar al beplan. Maar nadat ek die hele ding beplan het, het ek besluit om 'n ander tipe van retikulasie daar te stel wat heelwat probleme opgelewer het en waar ek die hooftoevoer moes verander. Dit is 'n meer ekonomiese en 'n meer praktiese skema op die oomblik en ek dink 'n mens se beplanning moet altyd so ingestel wees dat jy dit as daar veranderings voorgestel is, jy dan weier om dit te verander. Jou beplanning moet buigbaar wees om ander idees en metodes in te neem.

Wat betref ons strewe na groter produktiwiteit en die kwessie wat mnr. Barnard genoem het in verband met mededinging, stem ek volkome saam met hom. Medelinging is baie goed maar ek dink my Stadsklerk gaan meer uitwei op sekere aspekte hiervan en ek wil net volstaan by hierdie.

Mr. J. S .du Toit (Town Clerk, Roodepoort) said in his reply :

In sy antwoord sê mnr. J. S. du Toit (Stadsklerk, Roodepoort) :

I want to thank you and the delegates present here today for your wonderful co-operation. You've made it a pleasure for me to read the paper and, by the way you've responded to it, I now have the same pleasure in replying to your various questions.

First of all, there is Mr. Bill Botha from the Sound Desk. I'd better keep on good terms with him as it's very easy for him to switch me off ! Mr. Botha wants me to define more clearly what is meant by " motivation." I know very little about psychology but it is said that every human being has, what the sociologists call, his own " value system " and that every human action is ' motivated ' by the urge to satisfy a need or want of some sort. Primeval man, of course, had a job just surviving, and this is still the case in many parts of the world today.

During a period of oppression when unemployment is rife, job security will rank very high. I believe, too, that the prime concern of prisoners-of-war during the last World War was how to get hold of more food, and that they never discussed sex. Therefore, to reiterate, one can never be dogmatic about what motivates people, as they are differently motivated at different points of time and under different circumstances.

When recruiting an official for a particular job, therefore, it is as well to find out how he is motivated and why. In this way you may save yourself the trouble of training his successor within a short space of time.

Mr. President, I want to thank Mr. van Loggerenberg and all the others for their very kind remarks about my paper. It is indeed encouraging. I'm glad that Mr. van Loggerenberg drew the distinction between what is called the " profit motive " in the private sector and the "service motive" in the public sector. However, whether it is the objective of the private concern to maximise profits or the objective of the public concern to improve the service, both sectors still have to make use of the fundmentals of good management.

The problem of long-range planning was raised and the questions asked how it was possible to plan accurately for the future. Of course, this is not possible. (This question was also raised by Mr. Loubser of Benoni). What we have tried to do in Roodepoort is to establish improved communication between the township developers and the local authority. We've pointed out to them that if they want service from us, they have to keep us in the know; and the better the co-operation we get from them, the better the service they, in turn, will get from us. Thus, the better he will be able to sell his stands because he can with a certain amount of confidence tell the prospective buyers when services will become available.

A further problem posed was why the capital

expenditure to be incurred in the provision of these services should be included in the municipal budget. All expenditure incurred by a municipality—whether it is rate fund expenditure on behalf of township developers—must be included in the budget because it forms part of our system of country-wide financial planning, which is controlled by the State Treasury.

We've had quite a problem with the State Treasury in that, because of our rapid expansion, they wanted to limit us to a certain arbitrary growth rate or increase in expenditure, but we were able to prove to them that we are really providing essential services and, by being able to present to them our long-range planning programme, we were able to indicate to them what the anticipated expenditure on capital works would be over the next five years. They then agreed to leave our programme uncut after we have made certain reductions ourselves. This is the kind of advantage to be gained if you are able to prove that your long-range planning has been fairly realistic.

Mr. de Villiers of Rustenburg mentioned the question of pool transport. This is one of the problems we are still wrestling with. Ons het die probleem—ons vermoed dit nie; ons opnames het reeds bewys; ons weet dit—dat baie van ons vragmotors nie meer as 50% beset is nie. Die onbesette vragmotor is nie soseer die groot probleem nie want hy raak nie op terwyl hy staan nie, maar vir elke vragmotor is daar 'n bestuurder wat aansienlike koste verteenwoordig en wat jy 'n plan moet mee maak. Wanneer ons die antwoord daarop het sal ons vir hom sê.

Maar dit weet ek wel dat in die private sektor by konstruksiefirmas—miskien wat nie soveel vragmotors gebruik nie of vervoer probleme het nie—is daar 'n persoon in beheer van vervoer en omdat almal verplig word om vooruit te beplan (die week se werk ten minste en absoluut die volgende dag se werk) kan die mense wat vervoer benodig hulle vervoer aanvra in terme van werk wat gedoen moet word en nie soseer voertuie wat hulle **dink** nodig is om daardie werk te doen nie, m.a.w. 'n poelstelsel vir voertuie is onprakties en onmoontlik waar daar nie dwarsdeur die organisasie behoorlike vooruitbeplanning van werk is nie.

Mnr. Barnard van Brakpan het genoem dat dit nie so maklik is om al die teoriëe wat hier genoem is, in die praktyk toe te pas nie; daar is veral verwys na die mededingende bedryfslewe. Nou wil ek vir u sê dat 'n mens maar net 'n bietjie jou gedagte moet laat gaan. Die beginsel van mededinging is deur my toegepas in dié sin dat die Stadsingenieur nie graag wil afsteek by Piet nie. Ek wys vir hom hoe goed Piet beplan en ek noem dit vir hom dat die Raadslede nogal beïndruk is met Piet se beplanning en toe kom hy met sy beplanning. Die Stadsingenieur maak hoofsaaklik nie gebruik van die PERT-diagramme nie; hulle begin met die meer eenvoudige lyndiagramme, die Ghanttkaarte. Hoewel daar is één geval waar hulle wel gebruik gemaak het van 'n PERT-diagram en ek sal u sê hoe dit gebeur het.

U weet die mense skrik gewoonlik wanneer jy van PERT praat. Normaalweg is die indruk dat dit 'n vreeslike ingewikkelde proses is, veral met die verskillende matematiese verhoudings wat Piet hier op die bord gehad het. Dis werklik nie so ingewikkeld nie.

Ons het ongeveer 40 van die toesighoudende personeel van hoofde- tot voormanvlak op 'n eendagkursus gehad by Roodepoort. Daar het ons die voordeel dat ons 'n O. en M.-opleidingsbeampte het wat die lesings kon gee en ons het die bediening van tee ge-PERT. U mag nou dink dis vreeslik simpel om die diening van tee to be-PERT, maar toe ons 'n lys gemaak het van al die aktiwiteite daaraan verbonde—die mees optimistiese tyd om 'n aktiwiteit af te handel, die mees praktiese tyd, ens.—toe kon ons die volledige PERT-oefening doen. En weet u wat, toe daar nagegaan is op al die aktiwiteite wat op die lys voorkom, toe is een baie belangrike aktiwiteit weggelaat, en dit was om die tee te kry, die tee-blare, om te kan teemaak !

Nou moet u maar self terugdink op die verskillende werke, hoe dikwels die werk moes staan omdat die materiaal nie betyds op die werk afgelewer is nie.

Daar is gesê dat baie personeellede daarop ingestel is om werk te ontduik. Dit word heeltemaal toegegee. Daar is ook verwys na Jan Marais se versoek dat ons in die bedryfslewe—die publieke sowel as die private sektor—moet strewe om al die onnodige papierwerk uit te skakel. Ek het ook in my referaat 'n aanduiding gegee dat baie tyd in 'n munisipaliteit verkwis word met die skryf van verslae wat selde of ooit gelees word.

Ten opsigte van die funksionele kaart opgestel deur mnr. Botes, het ek gesê dat daar is party van die funksionarisse wat weggelaat is. Hulle verskyn wel op sy amptelike kaart maar die stukke is ter elfder ure getik en die tikster het vir my gesê sy kon nie alles op een vel papier uitkry nie en daar was nie tyd om 'n ander plan te maak nie. Wat u eintlik voor u het is 'n funksionele kaart; dis nie soseer 'n organisasiekaart nie. Ek het in die referaat aangedui dat jou funksionele kaart en jou organisasiekaart aangevul moet word deur 'n taakbeskrywing van die verskillende funksionarisse.

Mr. President, for that purpose I have appended to the paper the job description of a personnel manager. Personnel management is a very specialised function and I have the uneasy feeling that this is something we are really neglecting in local government, in that various heads of departments try as best they can to play the role of amateur personnel managers. I

wonder whether the time hasn't now come for us in local authorities to pay more attention to personnel management.

We in local government have to compete with the private sector for labour. It is not good enough to hold out as bait such factors as job security, etc. After all, it's been a long time since we had a depression and job security doesn't mean all that much these days. However, if we can recruit the right kind of person, properly motivate and train that person, and then ensure that the work climate in our various organisations is such that there is really room for advancement, then we will retain those persons.

That is why I made the challenging statement earlier, Mr. President, that if you have too many levels in your organisation you will find that a man has too many superiors. Basically, one shouldn't have in any local authority, more levels than Piet has shown on his functional chart because that will enable every man to advance to the maximum of his own potential. This doesn't necessarily mean that you will be able to keep your men forever but, if you have a system of programmed training, you will find that when your key-men leave, there will be others to take their place.

It is quite true that a good kick is sometimes necessary to motivate some people but you can't very well go round 'kicking' all the employees because then you will find that it simply doesn't work and your motivation will be negative.

As far as the application of O. and M. in local government is concerned, I, as a member of that Institute, have to admit that we are only scratching the surface; we haven't really got to grips with the problem. The reason for this is that there are not sufficiently-trained O. and M. investigators who can apply the techniques of systematic investigation in their own work environments. It is very difficult for a man who doesn't possess the necessary training for a particular job, to appreciate all the intricacies of that job and to pass judgment, or even to make sensible recommendations. No outside O. and M. investigator can beat you to the job, provided you have yourself mastered the various techniques, and, basically, all this requires is that you should be constantly critical about the things you are doing and not merely assume that you are doing it in the best and cheapest way.

Die vraag is gevra: indien daar dan nou bestuur moet word op die wyse soos in die referaat uiteengesit, hoeveel addisionele personeel nodig sal wees om sodanig te bestuur? Die antwoord is, nie **meer** personeel nie, maar **minder** personeel. Die gedagte is tog al die tyd om die kaf van die koring te skei, om die onnodige take te vermy, om kortpaaie te vind vir die verrigting van die noodsaaklike werk, en dit vereis bloot dat by jou bestaande personeel daar 'n ander ingesteldheid teenoor die werk sal wees.

Mnr. Lombard het melding gemaak van die funksionele kaart en gevra wie verantwoordelik is vir funksionele kaart en gevra wie verantwoordelik is vir die langtermynbeplanning. Op Roodepoort het ons die situasie dat mnr. Botes nie al die dinge kan doen wat hy graag wil doen nie, maar, as hoof van die Departement, is hy die hoofbestuurder van daardie Departement en, in terme van ons definisie van bestuur, is hy die persoon wat die primêre verantwoordelikheid vir beplanning (langtermyn-, mediumtermyn- en korttermynbeplanning) het; wat moet sorg dat die organisasie behoorlik georganiseer is; dat die mense die nodige leiding het en die beheer sodanig is dat daar aan die vereistes wat vir die werkers gestel word, voldoen word.

Mnr. Burger het 'n interessante onderwerp aangeroer—dié van die veelvuldige-dissipline-benadering. This, Mr. President, is not something new. We have these fancy names for well-known concepts. I believe it was Solomon who said that the multiplicity of the advisors improves the wisdom! This should certainly be done wherever it is necessary.

The PERT programme presented here is one of a fairly large housing scheme comprising about 450 flats to be established on land that is at present agricultural land where there are practically no municipal services to speak of, and it serves as a case in point.

The various departments were called upon to investigate all that would be required in order to get this scheme off the ground and, having done so, we were able to prepare a programme for the provision of the necessary essential services, the design of the scheme, leading up eventually to calling for tenders, the erection of the buildings and the moving in of the first tenants.

We had another case of a fairly large depositing site in a marshy area where it was very convenient to deposit rubbish but we had complaints from the public because of the problem of stormwater and the dampness. Added to these were problems such as scavengers looking for all sorts of odds and ends during the weekends, the public indiscriminately dumping rubbish there and an ESCOM power line crossing the site. Again, all the heads of the departments that could make a contribution were called in and, in the end, we arrived at a solution defining the responsibilities of each department and the kind of help that would be forthcoming from each of them; and we believe that the problem was fairly well solved.

I have also indicated in my paper that if management is to be meaningful there must be certain well-defined objectives which must be strived at. If one is not striving towards achieving any particular objective, what is one doing? Is one just muddling along, or what? Of course, it is true that anything and everything can be exaggerated and one must therefore

forever guard against the 'tail wagging the dog'. In other words, start off with a global approach to a problem; think in terms of major activities; think in terms of the important things and sever these from the less important things; always keep your mind and attention focussed on the prime objective you want to attain, and in this way you will avoid getting bogged down in detail.

It is, of course, advisable that, once objectives have been clearly established, there should be a system of programmed budgeting. One inevitably finds, though, that when the budget of a local authority is prepared, we have to deal with the competing demands of the various departments. Then there is also the threat from the State Treasury that the capital expenditure might have to be slashed considerably. This serves to emphasise the need all the more for clearly establishing priorities because if they are not properly established and severe cuts in the capital programme have to be made, it is so easy to make the mistake of cutting indiscriminately.

Capt. Joynt mentioned the problem—partially replied to by Mr. Botes—of an amount of R4 000 to R5 000 being spent annually on advertising costs. This is also something that bothers us but, Mr. President, is this not because local authorities generally—and I am referring particularly to the smaller ones, including Roodepoort in this group—have neglected for so long to do something about the training of staff. How often, and for how long have we not relied upon our ability to purchase staff from outside, be it from the Railways or other private concerns. In other words, if one small local authority cannot afford one Civil Engineering student or one Electrical Engineering student at university, is there really any reason why a number of local authorities cannot pool their resources and do just that.

The lack of co-ordination in planning, not only on a local scale but also a much wider geographical basis, was also mentioned. I think the Provincial Administration in the Transvaal is now triyng to do something along these lines, especially as far as regional schemes serving a wider metropolitan area are concerned.

There is, for instance, fairly close liaison between us and Johannesburg who provides the sewerage outfall services for about 75% of the Roodepoort area. Similarly, there is close liaison between us and the Rand Water Board. As I have tried to indicate in my paper in the plan of action for long-range planning, whoever can make a contribution towards improving your planning should be called upon to do so. And wherever a joint action is necessary in planning, that joint action should be forthcoming. Planning, to be of any value at all, must be practical. If any planning takes place in a vacuum it is pretty useless.

The problem of the presence of the big firm was also mentioned, this also being the problem, possibly, of the big municipality—that the organisation is becoming so bureaucratic that we have what we term the 'dehumanisation' of the worker. The worker feels that he loses his identity and because of this becomes frustrated, and it becomes increasingly more difficult to motivate him.

Many schemes have been thought up—job enlargement, job rotation—in order to increase the worker's interest. The important thing to bear in mind is that if your worker does not know and does not appreciate how vital the role is that he is playing, one can hardly expect him to display the kind of interest in his work that is necessary for maximum productivity.

They do this sort of thing to capture the market and, having done so, find their losses come down. The solution is the placing of limits on the ever-increasing mergers of larger firms and the economists suggest that these firms establish what the optimum size of the firm is. When I refer here to 'firm', I don't mean the umbrella undertaking. It is even possible for one organisation to have under its control various competing firms.

Referring to the question of the cost and the relative value of the PERT technique, I can quote a good example: after this exercise of PERT-ing the service of tea, every department had to undertake a particular PERT study of practical use and necessity in their particular work spheres. The Roads Division, for instance, was called upon to PERT a road construction scheme of their own choice. They chose one where the Department had received an estimate as well as the plans and specifications for the construction of roads in a certain township, from the township developer. The Roads Engineer, having ascertained the cost (which happened to be the lowest tender received by the township developer) came to terms with him, claiming, of course, the approval of the Council. The arrangement was that if the Council would do the work the developer would then pay over the total cost to the Council. This, naturally, suited the developer down to the ground. For one thing, he was quite sure that the Council wouldn't come bothering him about the quality of the work or anything of that sort.

The outcome of it was that, whereas the lowest tender received from the competitors outside was something like R110 000, the Town Engineer's Department did the job for R80 000, making R30 000 available to the Council. This was, however, a properly planned job; they prepared a PERT diagram, went into the various cost factors fairly carefully and were then quite convinced that there would be something in it. They were also given authority to promise small bonuses to the various workers, which had a wonderful effect. We did this both in the Water and Sewerage Departments as well and at the end of last

year my Council paid out an amount of approximately R20 000 in cash bonuses to its staff and this represented not more than 5% of the total savings by the various departments.

Regarding the question of combining the efforts of the various departments in long-range planning, we have been busy at this game for about 12 months in Roodepoort. As you know, the Transvaal Ordinance does not permit any standing committee in the smaller local authorities apart from the management committee. The Council overcame this quite easily by appointing the so-called Section 59 Committee with terms of reference that would take them about 20 years to complete! So there we have our illegal and yet legal standing committee.

This Committee is comprised of councillors and heads of departments and each department has to think in terms of the long-range objectives for his department and how these will be affected by those of other departments. So the chief health official who, for instance, is in charge of refuse collection, must take note of the anticipated township development in the various areas as this will help in the choosing of his depositing sites. So also the Town Electrical Engineer must take note of what services are being planned by the Civil Engineer's Department so as to avoid duplication of services in any one area. So the Committee functions more or less along the lines set out in the annexure to the paper. We are still battling but we are now getting to the stage of focussing our attention on our real planning problems and we find that, whereas we started off with a fairly loose circle, we are now drawing closer together and are appreciating more and more the need for a systematic planning approach to our problems.

The Convention expressed its appreciation to both speakers for their outstanding contributions.

Die Konvensie spreek sy waardering teenoor albei sprekers uit vir hul uitstaande bydraes.

THIRD DAY

MORNING SESSION

The President opened the proceedings by saying:

Ons is vanoggend bevoorreg om Dr. Straszacker, Voorsitter van EVKOM, by ons te hê en ek glo nie hy het enige bekendstelling nodig nie want u ken hom almal. Toe ek opgelet het dat hy hierdie Kongres sou bywoon het ek dit goedgedink om hom te nader om 'n paar woorde aan ons te rig.

Ons weet wat 'n belangrike rol Dr. Straszacker vervul met die ontwikkeling en verdere kragvoorsien-

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Dr. R. L. Straszacker (Chairman of ESCOM, Johannesburg) addressed the convention as follows:

Mr. President, let me begin by congratulating you very heartily on your appointment to this important post in your organisation.

Mnr. die President, namens EVKOM, wil ek u ook van harte bedank vir die geleentheid wat u my bied om 'n paar woorde te sê. Ek was baie jammer dat ek nie Maandag by die openingsplegtigheid hier kon wees nie. Ek verstaan dat daar heelwat dinge gesê is wat ook EVKOM raak en ek wil in besonder my waardering betuig vir die goeie gesindheid wat u jeens my organisasie in u rede geopenbaar het. Laat ek nou eerlik wees, vir ons by EVKOM is die be-

DERDE DAG

OGGENDSITTING

Die President open die verrigtinge deur te sê:

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ing in Suid-Afrika en ons in besonder as munisipale ingenieurs waardeer sy gesindheid en die goeie samewerking wat ons geniet tussen ons en EVKOM.

It's a long time since we've had the privilege of listening to Dr. Straszacker—the last time was in 1963 in Margate—and it is therefore a pleasure for me to call upon him to address this Convention.

Dr. L. R. Straszacker (Voorsitter van EVKOM, Johannesburg) spreek die Konvensie soos volg toe:

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moedigend om te weet dat die „skaduwee van EVKOM" nie meer beskou sal word as een van die plae wat u Vereniging treiter nie.

Mnr. die President, ek wil my graag in breë trekke vereenselwig met die gedagtes wat u in u rede uitgespreek het oor die ontwikkeling en voorsiening van elektrisiteit op 'n landswye grondslag. Aansluitend by u woorde en, soos ek verneem, ook dié van die Adjunk-Minister, huiwer ek nie om ons waardering te betuig vir die samewerking wat ons van ons verskillende munisipaliteite ontvang het nie. EVKOM se landswyd-gekoppelde kragstelsel sou nie nou al

ekonomies uitvoerbaar gewees het as dit nie was vir die deelname van ons groot munisipaliteite nie.

Die Adjunk-Minister het glo in sy rede die landswye voorsiening van krag oor 'n breë boog gegoei en uitvoerig gewys op die talle voordele van 'n geintegreerde stelsel. Daar hoef ek dus niks by te voeg nie maar dit is miskien gepas dat ek hier kortliks stilstaan by die jongste wysings van die Elektrisiteitswet. Die wysigings raak twee aangeleenthede: die eerste is die stigting van 'n sentrale kragontwikkelonderneming wat reeds vermeld is.

Ek kan hier net byvoeg dat die uiteindelike voordele van so 'n onderneming waarskynlik veel groter sal wees as wat nou voorsien word. Dit sal sekerlik help om die bedryf van ons kragtasies op 'n eenvormige grondslag te plaas en, danksy die hoëspannings-leidings wat al die stasies sal verbind, sal dit beslis die ekonomiese bedryf van die stasies tot 'n optimum peil moontlik maak.

U sal terug vra hoe die stigting van die sentrale kragontwikkelonderneming EVKOM se bestaande ondernemings sal raak. Die taak van die ondernemings sal voortaan hoofsaaklik beperk wees tot die verspreiding van elektrisiteit in hul onderskeie gebiede. Hul sal dus in wese streeksbestuurders van die nasionale organisasie wees en hulle funksie sal in baie opsigte ooreenstem met dié van munisipale elektrisiteitsdepartemente. Hierdie nuwe reëlings raak net vier van EVKOM se huidige ondernemings nl. Wes-Kaapland, Grens, Natal en Rand en Oranje-Vrystaat. Die ander ondernemings kry reeds hulle elektrisiteit van een van hierdie ondernemings.

Dis natuurlik wenslik dat die verskillende ondernemings hulle afsonderlike verspreidingsgebiede moet behou want die koste-struktuur verskil onderling. Die grondbeleid dat krag teen werklike koste verkoop moet word bring ook mee dat die prys van elektrisiteit wat aan die verskillende ondernemings voorsien word nie dieselfde kan wees nie. Dit blyk duidelik uit 'n oorweging van die metodes van die toedeling van die koste van die duur transmissie-lyne wat die ondernemings met mekaar verbind. Hier pas EVKOM die beleid van relatiewe verbruik toe. Dit behels dat die kapitaal, bedryfs- en instandhoudingskoste van elke groot transmissie-lyn pro rata volgens die gebruik wat elke onderneming daarvan maak, toegedeel word.

So byvoorbeeld moet EVKOM se Wes-Kaaplandse onderneming die totalle koste dra van die lyn wat De-Aar met Wes-Kaapland verbind. Dit sal so bly totdat die lyn dalk eendag in die omgekeerde rigting gebruik word om krag van hier na die binneland te vervoer—dan sal natuurlik die binneland daarvoor moet betaal.

'n Laaste opmerking wat betref die sentrale kragontwikkelonderneming: een van die meevallers van so 'n onderneming sal wees dat dit as 'n eerste stap sal dien om die tariewe van die verskillende verspreidingsondernemings nader aan mekaar te bring. Ek moet egter beklemtoon dat hierdie nivelleringsproses nie binne afsienbare tyd—en waarskynlik ook nooit—tot algeheel eenvormige tariewe oor die hele land sal lei nie. Daarvoor sal die koste-struktuur in verskillende dele van die land altyd te onegalig bly.

Mr. President, the second amendment to the Act is equally important and is of direct concern to you. All over the world many public utilities which provide the nations' power supplies, find themselves driven on a course of expanding output at a rate of between 7% and 8% a year. So that, after allowing for escalation of prices and the replacement of old plant, they are driven—whether they wish it or not—to an annual capital expenditure on new plant which approaches a figure of 9% to 10% of the capital invested in their undertakings. In the case of ESCOM capital expenditure has grown over the past 30 years at an average rate exceeding 9½% per annum, which means that the capital structure must be doubled in a period of about eight years.

Capital formation to provide for expansion is a norm of every business enterprise. In fact it is abnormal when a business organisation fails to set aside some profit for its future needs. It is now an accepted principle that it is imprudent for ESCOM to rely wholly upon the savings of other people to provide capital for its own expansion. The Electricity Amendment Act of 1971 has given ESCOM the power, with the approval of the State President, to set aside annually a contribution towards a capital development fund which must be invested in ESCOM stock. And it is hoped, by this means, to raise the level of internal capital formation to the proportion which has been found necessary in other countries i.e. to approximately 50% of the annual capital requirement.

Although the Electricity Act has been amended to grant these new powers, the form of control which has operated for nearly half a century, remains. Before ESCOM is authorised to establish a single generating undertaking, it must apply to the Electricity Control Board for the necessary permit and amendment of its existing licenses; and the procedure of advertising its proposals and of providing an opportunity for considering objections at a public hearing, must be followed.

In determining contributions towards the Capital Devedopment Fund the control is the same as the control which has existed in connection with contributions to the Reserve Fund. There is a statutory limitation which is also controlled by way of approval of the State President. The amount which may be set aside in any one year for the Reserve Fund and the Capital Development Fund **together** is limited, as before, to 3% of the outstanding loans: and the balance in these funds—excluding profits and earnings in the

fund—is limited to 7½% and 15% respectively, of the outstanding loans.

In so far as the Capital Development Fund is concerned, this means that if the growth of ESCOM's capital requirements continues at the present rate and if its finances continue as at present in the form of loans redeemable at the end of about 25 years, the contributions towards the Capital Development Fund will settle down at a cost not greater than between 5% and 10% on the cost of electricity.

Mnr. die President, ek wil ten slotte stilstaan by 'n belangrike paragraaf in u rede: „Dit is egter ook 'n feit dat die kleinmaat verspreiding van elektrisiteit deur plaaslike owerhede aan hulle verbruikers, of hulle nou huishoudelik, kommersieël of industrieël mag wees, binne die gelisensieerde voorsieningsgebied van die plaaslike owerheid nie net die demokratiese reg maar ook die plig van daardie owerheid is en moet bly." Met hierdie standpunt gaan EVKOM volmondig akkord. Ek weet hierdie standpunt is ook by die voorige kongres (die een te Umtali) gestel maar dis belangrik genoeg om herhaal te word. Ek wil ook herhaal dat dit EVKOM se beleid is om dié plaaslike owerhede in wie se gebiede EVKOM nog elektrisiteit regstreeks voorsien, aan te moedig om ons netwerke oor te neem.

Nou is dit ongelukkig so dat EVKOM al by geleentheid betrek is by geskille oor toevoere in die gelisensieerde gebiede van plaaslike owerhede en bykans, sonder uitsondering, is EVKOM teensinnig in die geskille betrek want dit spruit voort uit die bepalings van artikel 41 van die Elektrisiteitswet. Soos u weet bepaal dié artikel, by implikasie, dat 'n verbruiker in die regsgebied van 'n plaaslike owerheid sy toevoer van 'n alternatiewe bron kan verkry mits die plaaslike owerheid daarmee akkord gaan.

Die artikel bepaal voorts dat indien daar beweer word dat 'n plaaslike owerheid sy toestemming sonder voldoende rede weerhou, die Elektrisiteitsbeheerraad oor die saak uitsluitsel moet gee. Gelukkig ontstaan hierdie soort geskil in die praktyk nie dikwels nie. In gevalle waar die plaaslike owerheid nie die toevoer kan lewer nie omdat dit bo die vermoë van sy verspreidingstelsel is, is daar ook geen probleem nie. Die aluminiumsmelter op Richardsbaai is 'n voorbeeld hiervan.

'n Probleem ontstaan egter waar 'n groot nyweraar 'n regstreekse toevoer van EVKOM aanvra omdat dit na bewering vir hom goedkoper sal wees as 'n munisipale toevoer. As so 'n nyweraar en die plaaslike owerheid nie tot 'n vergelyk kan kom nie, kan die saak na die Beheerraad verwys word en uitspraak kan miskien teen die plaaslike owerheid gegee word. By wet is EVKOM dan verplig om die toevoer te voorsien maar teen sy sin en ten koste van goeie betrekkinge met die betrokke plaaslike owerheid.

Ek wonder, mnr. die President, of die tyd nie gekom het dat sodanige gevalle verminder word—indien nie geheel uitgeskakel word—deur die grenswaarde van 150kW. wat tans bestaan, vir nuwe verbruikers, aansienlik op te stoot nie. Hierdie saak, soos u weet, is natuurlik iets vir die Beheerraad en nie vir EVKOM nie.

In gevalle waar verbruikers in munisipale gebiede vandag deur EVKOM voorsien word op grond van bestaande kontrakte is dit verstaanbaar dat die wet die verbruikers sal beskerm. Dit is ook begryplik dat die plaaslike owerhede graag toevoer na hierdie verbruikers wil oorneem. Alhoewel EVKOM daartoe bereid sou wees kan hy natuurlik nie sy kontrak met die verbruiker verbreek nie en dit moet aan die munisipaliteit oorgelaat word om die verbruiker te oorreed om vrywilliglik by hom aan te sluit. EVKOM sal alles doen om in daardie oorredingsproses mee te help, mnr. die President.

Alhoewel hierdie gevalle wat selde voorkom 'n dilema veroorsaak glo ek dat daar met goeie wil bevredigende oplossings vir almal gevind kan word en miskien kan hierdie konvensie daartoe bydra. Soos u weet het die Borckenhagen-komitee ook heelwat aandag geskenk aan die probleme in verband met elektrisiteitstoevoere aan nyweraars in munisipale voorsieningsgebiede en sekere aanbevelings in hierdie verband gedoen.

EVKOM wil weereens beklemtoon dat die handhawing van goeie betrekkinge met ons verbruikers vir ons van kardinale belang is. Enigiets wat u dus kan doen om hierdie knelpunte uit die weg te ruim sal ons hartlike steun geniet. Baie dankie, mnr. die President.

Thanking Dr. Straszacker, the President said :

Ek glo nie daar kan enige twyfel meer bestaan wat die verhouding is tussen plaaslike bestuur en EVKOM nie. Ons is besonder bly om dit weereens beaam te kry. Ek wil graag hierdie Konvensie se dank oordra aan u dat u die tyd kon afstaan om hier teenwoordig te wees om ons toe te spreek. Ek kan u verseker dat sover dit munisipale ondernemings

Toe hy Dr. Straszacker bedank, sê die President :

aangaan, ons alles in ons vermoë sal doen om, wat kragvoorsiening betref, ons bydrae te lewer, want slegs daardeur kan ons slaag om ons gemeenskaplike probleme die hoof te bied. Nogmaals, Dr. Straszacker, namens die Konvensie, ons hartlik dank vir u toespraak vanoggend; ons waardeer dit ten seerste.

The President introduced Mr. C. T. Carter, Pr.(Eng.), B.Sc.(Eng.), Cape Town Electricity Department, who presented his paper **"Aluminium Cables, Jointing and Accessories"** which was published in Vol. 1(a) of the 1971 Proceedings. He illustrated it by means of diagrams which were screened and amplified the various points in the paper. He made the following corrections and additions to the printed text :

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2. Historical : Today the price per metric ton of copper ingot is approximately R810-00 and that of aluminium, R484-00. After conversion into wire form this results in aluminium of similar conductivity to copper costing per unit half to one-third of the price of copper wire.

3.4 Chemical : "This film which" builds up to about 130 angstroms or approximately twelve times ten to the minus six millimetres thick, "has considerable electrical resistance and must be removed (or ruptured) to permit good electrical contacts in joints . . ."

Additional comments by Mr. Carter are available on application to the Secretaries.

Die President stel mnr. C. T. Carter, Pr.(Ing.), B.Sc.(Ing.), van die Kaapstadse Elektrisiteitsdepartement, aan die Konvensie en hy lewer sy referaat **„Aluminiumkabels, Lasse en Toebehore"** wat in Volume 1(a) van die Verrigtinge gepubliseer is. Hy illustreer die referaat by wyse van diagramme wat op 'n skerm gegooi is en brei uit op verskillende punte in die referaat. Hy maak die volgende korreksies van en byvoegings tot die gedrukte stuk :

Correction under "Current Ratings" : Where it states on p. 67 of the paper that the "ratio of aluminium resistance to that of copper is 0,61;" it is obvious that this should be the other way around.

6.1.1 Permissible conductor temperature : Recent research since the drafting of this paper, has established a permissible conductor temperature of 160 degrees Centigrade, similar to that of a stranded conductor. Because of the thermal characteristics of PVC, the limited short circuit temperature of 130 degrees Centigrade is still applicable to solid aluminium conductors having this type of insulation.

Bykomstige kommentaar deur mnr. Carter kan op aansoek van die Sekretariaat verkry word.

Opening discussion on Mr. Carter's paper, Mr. F. J. Prins (S.A.B.S., Pretoria) said :

Toe ek toegestem het om hierdie bespreking in te lei het ek nie geweet waarvoor ek my inlaat nie. Ek het nie destyds die referaat onder oë gehad nie en ek het min gedink dat mnr. Carter sy draai so wyd gaan gooi. Want hy het hom behoorlik wyd gegooi—alle aspekte van die ekonomises tot die tegniese. Hy het geprys waar geprys moet word maar ook gewaarsku waar nodig. Die referaat getuig van deeglike studie en baie ure se werk en ek wil dan ten eerste mnr. Carter gelukwens met sy vortreflike referaat wat hy op so 'n bekwame wyse aan ons voorgedra het. Namens al die ingenieurs hier wil ek hom graag bedank vir die klomp nuttige informasie wat hy bygebring het in 'n vorm wat vir almal op 'n latere tydstip baie nuttig te pas sal kom.

U weet Murphy het 'n ingenieur gedefinieer as 'n persoon wat 'n bietjie van baie weet en uiteindlik niks van alles weet! Ek voel nou amper asof ek daardie stadium bereik het wanneer ek op hierdie referaat moet antwoord, want daar is eintlik nie baie wat 'n mens kan byvoeg by wat mnr. Carter gesê het nie. Ek dink dus die beste benadering sal wees om uit te brei op sekere aspekte wat mnr. Carter in sy referaat genoem het.

The world price of copper at present is about 13 times that of 1933, but far more important to manufacturers and users, is the terrific day-to-day variation

Toe hy die bespreking oor mnr. Carter se referaat open, sê mnr. F. J. Prins (S.A.B.S. Pretoria) :

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of the price of this metal which makes forecasting and budgeting very difficult and people tend to go for a raw material like aluminium with a more stable price structure.

The price of aluminium on the world markets tends to remain fairly stable, although there are rumours that the present pricing system will be abandoned for individually negotiated prices in the near future. You notice I have talked about world prices because the conditions mentioned here do not strictly apply to South Africa; the Republican copper price being based on the average of the London Metal Exchange price of the previous month and thus being more stable. In addition the ingot price from Richards Bay far exceeds the ruling world price and there are rumours of further increases in the new year which will affect the position in South Africa.

Nevertheless, we are influenced by what people are doing in other countries and we must face the fact that aluminium has come to stay and has been accepted by the electrical industry in South Africa. But, as Mr. Carter pointed out, it is subject to certain limitations which must be accorded full cognisance if this metal is to be used successfully.

The major problems arising from the use of aluminium in the electrical field are due to four properties of the metal, viz. the familiar oxide film,

cold-flow, the coefficient of thermal expansion and the susceptibility to corrosion. Straightforward jointing and soldering methods used in the case of copper cannot, of course, be used with aluminium. Methods of jointing aluminium have been developed as outlined in the paper but it is necessary to use more highly skilled labour, properly trained and supervised, and the quality of the joint or termination is directly dependent on operator skill.

For soldered joints, the now universally used method relies upon a flux to break down the tenuous oxide film to ensure a satisfactory joint. Aluminium melts at about 660 degrees Centigrade, but the oxide film at about 2 000 degrees Centigrade so you have to rely on the flux to get rid of it. The problem is that the oxide is heavier than the molten aluminium and sinks to the bottom. Some fluxes must be very carefully removed from a soldered connection otherwise you have the problem of corrosion starting. Mr. Carter also mentioned certain medical problems associated with fluxes used in Britain. It would appear from reports that have filtered through that there are even more serious problems from a medical point of view and yet apparently those fluxes with no medical toxic side-effects are not as effective as those with toxic medical side-effects.

Ordinary solders are electro-positive with respect to aluminium and galvanic corrosion can occur in the presence of an electrolyte. Soldered joints, therefore, should be protected against moisture.

Mr. Carter mentions that a temperature of between 250 degrees C and 350 degrees C is required for the flux to react with the oxide film and that a pot temperature of 300 degrees C to 340 degrees C is required for basting. This means, of course, that the aluminium conductor must be raised to that temperature at the point of soldering at the point of jointing to ensure full penetration and a satisfactory joint. With aluminium being such an excellent conductor of heat you can imagine what would happen to a PVC diaelectric which is normally extruded at approximately 160 degrees C.

A typical example of the problems that can be encountered with soldered connections, especially in the case of the larger stranded connections, is illustrated by the following photograph. Here you have a length of aluminium conductor terminated inside a lug—actually there are two; one pair on the left and one on the right. We were asked to check the validity of these joints and we tried various electrical tests but couldn't prove anything. We had, however, reason to suspect that the joint was not properly consolidated and X-ray photos, obtained by means of an iridium isotope, revealed this. The lugs were cut off and sectioned in order to verify the information thus obtained and, as can be seen conclusively from the photo and the actual radiographs which I have here. this was achieved conclusively.

Aluminium will flow or "creep" away from highly stressed areas and the higher the temperature, the faster the rate of creep. It will continue to creep until the stress is equal to the ultimate strength of the aluminium. At high stress levels, relaxation of stress can occur and is evidenced by a reduction in load due to the change in metallurgical structure. The change of elastic strain to plastic strain occurring under these conditions would have the effect of significantly reducing the residual contact pressure in a joint to a point at which the joint may fail due to increased contact resistance. Such creep failures in soldered joints, as a result of widely varying electrical loads, are known.

When a copper connector is used with aluminium wire, intermittent operation or even complete failure can result. The reason for this is that aluminium expands about 33% more than copper for the same temperature rise. When copper surrounds aluminium and heat occurs, the softer aluminium has no room to expand and plastic deformation occurs, resulting in the aluminium being extruded from the joint. When the joint cools, the aluminium will not retract into place and the cross-sectional area of the aluminium, and consequently the contact pressure may be significantly reduced. This leads to further heating and more expansion until failure occurs. Generally it can be stated that copper bodied terminations on aluminium cable are unreliable and failure will result.

A method widely used to join copper conductors is by means of compression ferrules, but this method does not lend itself readily to aluminium conductors because the surface oxide layer has unsatisfactory contact characteristics which can lead to progressive deterioration of conductance when subjected to repeated load cycles. Because of the susceptibility of aluminium to plastic flow, the pressure applied during compression or crimping is vital, especially in the larger sizes of conductor. In this regard it should be noted that it is not possible to compress together perfectly aluminium of different degrees of hardness. There are authorities who insist that the temper of the ferrule or lug should be as close as possible to that of the conductor with which it is to be used, and I am glad to see that Mr. Carter has high-lighted this point. It should be noted that the compression jointing of solid aluminium conductors is much easier than that of stranded conductors.

Other problems associated with compression techniques are that they require long connections with attendant problems in the case of the larger conductors, and that hexagonal or similar connectors such as are used on 11kV networks, cannot be used for high voltage work, because sharp edges, compression seams, and the like generate strong electric fields which in turn introduce ionization.

The statement that stranded aluminium connections which have successfully withstood the 2 000 cycle type test in air, have failed after a few hundred cycles at normal conductor temperature when installed in a compound joint, is very interesting. I would like to put forward the thought that in the case of the joint in air (during load cycling) there is no restriction or mechanical stress applied and there is freedom of movement; whereas, in a joint box, restriction is present in the form of clamping. Hence, during heat cycling there could be considerable longitudinal forces generated at the ferrule resulting in movement of the conductors in the ferrule ,eventually leading to failure.

In the light of what has been said, it is not surprising that thoughts turned to welding and, as mentioned, this method has been successfully used in Germany and Great Britain and has now been adopted as the sole method by the Sydney County Council. Two of the drawbacks are that you still require trained personnel and that you have to cart quite a cumbersome equipment around with you. This again has led to the examination of the exothermic type of welding process as also mentioned by Mr. Carter. Reports from the U.S.A. indicate that it is being applied very successfully over there, the main point of criticism being the amount of smoke evolved. The exothermic reaction is a reduction of tin oxide in the presence of aluminium inside a graphite mould, producing a molten super-heated tin-aluminium alloy. Flow of the molten alloy over the conductors causes them to be melted and fused into a solid, homogeneous mass. A high temperature results from this operation but it's applied for only a very short time and is concentrated at the joint so that no harm is done.

I have a sample of such a joint here (one of the many that the Bureau has tested) from which you will notice that even over this short distance, the actual weld covers only about an inch. At the ends the strand formation is still practically intact. The weld is concentrated just at the point where it's needed to fuse all the strands together and to bond. We have done quite a number of tests on this type of joint at the Bureau in conjunction with sponsors and results to date bear out the American claims. I should perhaps point out here that all our tests, and those of the Americans, were done on plastic insulated cable. I doubt whether one would have the same satisfactory results on a paper-insulated cable where you have the residual oil layer on the conductor.

Mr. Carter mentions the case of the aluminium armour Northern Ireland that were still almost in perfect condition after 29 years of service. A similar wires of 33 kV cables laid across a tidal estuary in case was mentioned to me where it was claimed that the aluminium cables stood up much better than copper would have done under the same conditions. This was at the international airport at Hong Kong. But we should not be misguided. As long ago as the early thirties, Dr. Brazier warned against the susceptibility of aluminium to corrosion, especially where in contact with soil water, and some of our local supply authorities have had some sad experiences of this. Please also note the design of the so-called districable in Great Britain—the aluminium neutral conductor is protected by an extruded lead sheath and all the conductors are armoured by means of two corrosion protected steel tapes with a PVC sheath overall. A German version comprises a solid copper core for the neutral conductor, the aluminium neutral being extruded over it so that if you get corrosion of the aluminium and trouble develops the copper conductor will still operate the protection.

If satisfactory and dependable operation is required of aluminium cable this characteristic of the metal, i.e. susceptibility to corrosion, must be accorded the highest respect.

Mr. Carter mentions applicable specifications in his paper and it should be noted that, whereas in the past the South African specifications tended to follow very closely the corresponding British specifications, since metrication this is no longer the case. South Africa accepted the basic conductor sizes embodied in the I.E.C. Publication No. 228, as well as the principles postulated in that document, but whereas these principles were applied consistently in South Africa and the tolerances used for the purposes intended, this was not done by the I.E.C. in their own document or by Britain who base their requirements completely on document 228. The result is clearly illustrated in Table 1 of BSS 3988:1970, Solid Conductors for Insulated Cables; where, in column 1, the I.E.C. series of conductor areas is given and in column 2 the actual areas to which these conductors can be manufactured and still meet resistance requirements. The net result is that resistance requirements of the South African specifications are tighter than those of the British specifications and, in the case of solid conductors, the dimensions of the conductor are greater than those of the equivalent British conductors. This reflects in the lack of compatability of British accessories with cables made to South African specifications.

Regarding the remark made by Mr. Carter concerning lapped PVC beddings, I must point out that this was discussed very fully by the relevent committee, but as a result of reports from Europe that bursting had been experienced with these lapped type beddings (normally only two tapes are used) it was decided not to cater for this type of construction at this stage.

In conclusion, Mr. President, I think I should say that every user will benefit greatly by ensuring when he orders aluminium cables and accessories that they are all compatible. He should also give the fullest possible information to the supplier as to how the cable is to be used to ensure that he will get the right cable

for the right job and the right accessories.

As the saying goes, the proof of the pudding is in the eating, and we at the Bureau would be very interested to follow up on Cape Town's experience with their installation. We will be very interested in keeping track of their field experience and thereby augmenting our own knowledge.

Mr. J. A. Morrison (Simplex Electric of S.A. (Pty.) Ltd., Johannesburg) contributed to the discussion on Mr. Carters' paper as follows :

It was hoped that Dr. Bramley of the Aluminium Wire and Cable Company would contribute towards this paper. He, basically, is a pioneer of what we know now today as SOLIDAL cable and he has now developed this new type of cable which his particular contribution refers to, called ALPEX. Unfortunately he was not able to come but he has submitted a written contribution and with your permission I'd like to read it:

Mr. President, I'd like to make the following comments to Mr. Carter's excellent paper in the light of the most recent developments and experience in the United Kingdom—experience on 600 volt to 1 000 volt cables.

Today there's no doubt that in the U.K. both industrial and power distribution engineers accept that aluminium cables are as reliable in service as copper cables. The fact that aluminium conducted 600/1 000 volt cables have increased in use until today and are employed without exception for all main distributor installations by every one of the Area Boards in the U.K. proves in itself that they are more economical than copper cables.

In so far as industrial usage with PVC installation is concerned, in the range of 16 sq. mm to 300 sq. mm there's been virtually no usage whatsoever in the U.K. of stranded aluminium cables. When, because of the relative cost of the two metals, the swing away from stranded copper cables began for industrial wiring, it went straight into solid aluminium cables in order to take advantage of the economy of compactness introduced by Mr. Carter in Clause 7 of his paper. Today BS 6346 for Insulated Cables covers only solid aluminium cables and stranded copper conductor cables.

What I have said so far deals primarily with industrial power wiring. Now I'd like to make some remarks about the recent developments in Area Board distribution practice in the U.K. and the types of cables used for that purpose. In Clause 7.3 Mr. Carter makes reference to a PVC sheathed solid aluminium cable with extruded PVC bedding and also the variety with PVC tape bedding and aluminium strip armour.

It is true to say that in the U.K. neither of these versions has been used for distribution cables on anything other than small scale trial installation basis.

Mnr. J. A. Morrison (Simplex Electric van S.A. (Edms.) Beperk, Johannesburg) dra soos volg by tot die bespreking van mnr. Carter se referaat :

The thermal characteristics of PVC installation are not considered by the Area Boards as being suitable for overload conditions which were encountered in distribution networks, although they are eminently suitable for the fixed type load of installation encountered in industrial wiring. Therefore, when distribution authorities in the U.K. first swung from copper to aluminium for medium volt cables they did so by employing for the most part paper-insulated, lead sheath cable with stranded aluminium conductors; although two Area Boards did employ paper-insulated, lead sheath cables with solid aluminium conductors.

The stranded aluminium cable was then regarded as the rationalised cable design and remained so until the advent of increased interest in PME distribution systems over say the last five years. There is no doubt that many of the jointing difficulties attributable to aluminium cables which have been talked about by distribution engineers over recent years, are attributable to the difficulties encountered with M.I.N.D. paper-insulated cables with stranded aluminium conductors. This was stressed by Mr. Prins in his comments. There've never been the same difficulties with jointing solid aluminium conductors.

Now the advent of PME distribution led to the development of the CNE or Combined Neutral Earth System of cables in which there are three-phase conductors and a concentric neutral earth conductor as opposed to the three-phase conductors and neutral conductor and the concentric metallic sheath or armour hitherto used on conventional cables. Such designs immediately showed something between 20% and 30% saving in the metal content of the cable.

Mr. Carter mentions one design of CNE cable in the final paragraph of Clause 7.3 which is based on the French design known as Districable. He also mentions in 7.4 another design of CNE cable, CONSAC, having paper insulation and extruded aluminium sheath which is being used in some Area Boards in the U.K.

It is relevant that this Conference should now be given more information about the latest design of CNE cable touched on by Mr. Carter and for reference called ALPEX which was recently introduced (in fact, only last year) and which has since rapidly gained the approval of many distribution engineers in the U.K. This cable was first introduced in the IEE/ERA

Conference of Distribution held in Edinburgh in October 1970 and a paper by myself and Mr. Owen Hughes of the South Wales Electricity Board and a full description of the cable and the thinking that led up to this development is given on page 204 of the Proceedings of the Conference.

ALPEX distribution cables consist of 3 SOLIDAL (or solid aluminium) phase conductors insulated with cross-linked polythene (or XLPE) surrounded by concentric wave form neutral conductor—wave form being when they lay the neutral in longitudinal form, rather than round the cable itself. It is composed of aluminium wires and fully embedded in an extruded layer of non-vulcanisable, rubber-like material and sheathed overall with PVC. This particular construction was also referred to by Mr. Carter and by Mr. Prins.

Similarly, three-phase ALPEX service cables are also available. In these cables, as a result of a spiking test carried out by Area Boards, the current equalising tape around the neutral conductor has been omitted and equalisation is carried out in the joints themselves. Thus ALPEX cables have the following advantages:

* Synthetic types of insulant, this cross-linked polythene, having overload characteristics more in line with paper;
* solid aluminium conductor for compactness;
* economic advantages as opposed to copper;
* an aluminium neutral conductor which is now fully protected against moisture penetration and the spread of corrosion;
* unlike the paper cable it will not break down in the event of localised sheath damage and will maintain continuity of supply throughout;
* most important of all, as far as the construction goes, the cable can be live-jointed without the severance of the neutral conductor.

Co-incidental with the introduction of this cable a tailor-made jointing system was introduced. This covered both service joints and main through joints and branch joints; both neutral and phase connections of all types of points being mechanically bolted employing one size of bolt only.

The objective throughout (and this is again an aspect raised by a previous speaker on the simplicity of jointing which is so important now) of this jointing development has been the removal of the sheath to give a reliable simplified procedure. All bolted connections used in this system have been fully tested for requirements. Mr. Carter mentions the British Electricity Board's Report No. A.C.E.17 in Clause 8.3 of his paper.

The joint in question is finally made off in a lightweight polythene box filled with polyurethene resin or, as has now been developed, the use of heat-shrink materials.

In conclusion I would like to mention that the development of new type distribution cables has been extremely rapid in the U.K. during the last two years especially due to the advent of great interest in PME. ALPEX cables have played a major part in the development since, in the last 18 months, five of the twelve Area Boards in England and Wales have adopted it for medium voltage distribution. And now that this positive indication has come from the supply industry in the U.K. many other cable manufacturers who were previously not in a position to supply XLP-insulated cables, are now putting in continuous vulcanising lines and perfecting the manufacture of this type of cable which offers such interesting prospects for the future development engineers.

On behalf of the Convention, the President congratulated Mr. Carter on a most interesting and ably-presented paper and proceeded to introduce Mr. S. Goodall (President of the International Electro-Technical Commission) as follows:

Namens die Konvensie wens die President mnr. Carter geluk met 'n uiters interessante en goed-aangebode referaat en gaan daarna voort om mnr. S. Goodall (President van die Internasionale Elektrotegniese Kommissie) soos volg aan die Konvensie voor te stel:

We are very fortunate this morning to have with us the President of I.E.C. who is on a visit to our country on the occasion of the 25th birthday of the Bureau of Standards and the opening of their new complex in Pretoria.

Mr. Goodall is a graduate of the London University; was later Chief Engineer and Director of Henley Cables; director of A.E.I. responsible for engineering research; was President of I.E.E. 1958/1959, during which term of office he visited South Africa: he has served on several B.S.I. Committees and is now a member of the Executive Board; was a member and past-Chairman of the Board of National Inspection Council for Electrical Installations and Contractors; is a past-Chairman of BEMA Standards Policy Committee, past-Chairman of the British National Technical Committee and is now President of I.E.C. I ask the Convention therefore to give a very warm welcome to our distinguished guest and call upon him to address us.

Mr. Goodall addressed the Convention as follows:

Mnr. Goodall spreek die Konvensie soos volg toe:

May I first of all say how delighted I am to have this opportunity of being with you on this occasion, particularly so as this is my first chance ever to be with the AMEU on one of your conventions. I must say I'm extremely impressed with the way you set about things.

I want, if I may, to talk for a little while on International Standardisation. The preparation, adoption and even enforcement of uniform national standards is now so commonly accepted that in the mass of detailed, technical work involved it is possible to forget, or to ignore, the basic assumption underlying the initiation and continuation of such work. This assumption is that the removal of barriers to world trade contribute in the long-term to the well-being of mankind as a whole.

There are two broad aspects of this tenet which are reflected in the nature of the work undertaken by the principle international bodies concerned. The first is, that maintenance of, or improvement in, existing standards of living in the highly industrialised countries depends upon a reasonable growth in trade. The second is, that the more prosperous countries have a moral responsibility to assist developing countries in their efforts to abolish starvation, disease and poverty. The contribution made by international agreement on standards to the first of these aspects is self-evident. More recently, however, work has been undertaken which is intended to provide guides to good, safe and economic practice which should be of direct benefit to developing countries, and I shall be quoting a little on one such example.

It is, of course, impossible to assess the financial contribution which standardisation can make to the growth of international trade, but even a cursory glance at world trade figures for say electrical machinery and apparatus published by the United Nations, demonstrates that the total expenditure on both national and international standardisation work in the electrical field is only an infinitesimal proportion of the world trade figures themselves, e.g. according to the United Nations analysis world trade figures in these fields have risen from 4 500 million United States dollars in 1960 to 14 000 million United States dollars in 1969, and by comparison the present budget of the I.E.C. is about one million United States dollars. There can perhaps be few better examples of substantial gain for very little expenditure.

In addition to the obvious difficulty of language there are many practical problems presented during the course of international work, and I will attempt to analyse the most important of these and to suggest lines of approach which may help to resolve some of them. One is the question of priority either national, on the one hand, or international. In the more highly developed industrial countries national standards covering safety performance and reliability have been published over many years. This work was originally undertaken for the protection of the home consumer and the user, and sometimes with the deliberate intention of creating technical barriers against imports.

It's greatly to the credit of the pioneers of international work that the dangers of such attitudes were appreciated long before it became practicable to achieve international understanding and agreement. Even now the existence of such national standards, or the rapid evolution of new national standards, adds very considerably to the time involved in the preparation of a mutually agreeable international document. Even when this happy state is achieved, a still longer period is often required before the individual national standards are brought substantially into line: and sometimes even further time is required before manufacturers and users in a particular country are willing to adopt the full implication of the changes.

Delay is also inevitable when changes in national legislation are necessary, due to the application or product being covered by regulations. On the other hand, it may not be in the national interest to defer national work until agreement has been reached on an international level.

Ideally, it is apparent that international work should commence as soon as possible, preferably in the development stage of a new product. It may not at this stage be possible to agree to more than guide lines, e.g. terminology, but this of itself can be of the greatest value in reducing the possibility of crystallisation of national ideas to the point where subsequent international agreement is virtually impossible. Many examples of this difficulty have occurred in the past, but particularly in those technologies which are closely related to and depend on science, wiser councils now usually prevail.

Without doubt the best solution to this problem is for national and international work to proceed in parallel. Many countries where industry is not yet fully developed find it advantageous to wait for international recommendations and to adopt these later as national standards.

The yardstick that should be applied before new work is undertaken are necessarily mundane and practical. They are :

* that rational and not extravagant safety limits are set when obvious hazards to personal property exist;
* that the work should offer some commercial advantage in international trade, without restricting development and without sacrifice of safety in performance;
* or, that the work is a direct and immediate benefit to progress in developing countries.

Now I've made reference so far only to national and international work and later on I'll tell you a little more about the I.E.C. in particular. But in

addition to these international bodies—the other big one, as you know, is the I.S.O.—there are a few local area bodies, and the overall picture in Europe is now becoming extremely confused. (I'm very happy to find that this is not the case in South Africa). In fact I could rattle off here and now lists of initials of such bodies which I'm certain would confuse you just as much as they confuse me, so I don't propose to do it.

In the world as a whole there are probably 50 countries taking an active interest in standardisation work and, of course, many more reaping the benefit. All the leading countries operate a standards organisation, usually centralised in an institution such as the SABS. And at this point it gives me great pleasure to pay tribute to the excellent service provided to South Africa by the Bureau over the past 25 years. As your President has told you I've just had the privilege of visiting the SABS laboratories at Pretoria and in taking part in the 3rd Standards Conference and being present at the official opening by the Prime Minister of the new labs: and I can only report to you that I was very impressed indeed with the excellent service provided both to industry and the user by the highly developed mark scheme now operating which, incidentally, in my limited knowledge of world affairs in these spheres, is probably more highly developed than in any other country.

Previously I made some reference to the existence of regional standardisation bodies: these were originally conceived with a view to improving trade between local groups of countries and one example of such a grouping is to be found in Europe in the International Commission on Rules for the Approval of Electrical Equipment. Happily the initials CEE are now generally recognised, and this body for many years has prepared European standards for electrical equipment.

More recently a different type of regional organisation has emerged and this is concerned not so much with the preparation of standards but rather with what is now known as harmonisation of standards—rather a clumsy term which simply means trying to persuade the individual countries concerned, not only to subscribe to an international standard, but actually to use it. These two things are not necessarily the same. I won't go into great detail about these various bodies because since they are European they do not concern you directly. I don't think you lose a great deal by not being so concerned!

However, in view of my connection with the IEC it may be appropriate for me to give you some of our organisation and our work. First of all, how on earth did we come into being? Well, at the end of the 19th century and the beginning of the 20th century a number of electrical congresses were held and one such was the St. Louis U.S.A. International Electrical Congress in 1904, where a proposal was submitted by Colonel Crompton to the Chamber of Government Delegates that steps should be taken to secure the co-operation of the technical societies of the world by the appointment of a representative commission to consider the question of standardisation of the nomenclature and ratings of electrical apparatus and machinery. Crompton soon learned—and let this be a warning to us all—that if you are rash enough to propose that sort of resolution you usually get left with the baby! He was thereupon instructed to get on with the job and form the IEC! (laughter). It's to his credit, however, that he managed to get 14 countries to join together and the first meeting was held in 1906. So you see, at least we have a respectable history!

The Council itself met for the first time in 1908 and the first President was Lord Kelvin. I mention that because I want to stress our close relation not only with industry and users but also with science.

Today we have 41 participating countries and here I should make it clear that a country is not a member of the IEC. The only member permitted is a national committee—a national electro-technical committee, in other words—and our members of Council are automatically the chairmen of these national committees. You have a national committee in South Africa as I'm sure you know.

The actual form of the national committee is left to the country concerned but usually it represents all interests including, of course, the local bureau of standards, the manufacturers, the users, the government departments, government users and the like. Detailed technical work is conducted now in over 70 technical committees supported by a large number of sub-committees and working groups and in any year there will be over a hundred meetings of such committees somewhere in the world. In fact they're offered today anywhere where hospitality is afforded.

The secretariat of a particular technical committee or sub-committee is held by one country and at the present time one such secretariat is held by South Africa. The chairman of either a technical committee or sub-committee is appointed on the recommendation of the secretariat concerned. These men are eminent engineers who have considerable knowledge of the particular branch of technology to be studied. Last year Mr. Middlecote was appointed chairman of the recently formed technical committee No. 64 dealing with the electrical installation of buildings, and considerable progress has been made under his guidance.

I'd like to break off there for a moment because you may wonder why on earth the IEC is dabbling in that particular subject. The original concept came under the heading number two that I mentioned at the start of this talk, namely that some general principles might evolve which could be of value to developing countries. An interesting thing that has happened is that as the major powers, including South Africa, have contributed towards this work, more and more interest

has been shown, not only by the developing countries who are there in great force, but also by the major powers themselves and even the United Kingdom (and I say this knowing the stodginess of our people in this field!) is now seriously considering the effects of this work on the 15th Edition which is now under preparation. So we can look for some changes I think, although that was not the original purpose.

Draft IEC recommendations are prepared by technical committees for submission to national committees for approval before publication by central office, and this is where, of course, we run up against those inevitable delays in international work. We can get a committee of experts together fairly easily; perhaps a little less easily, but sometimes quite rapidly, we can get them to agree: but once they've published their findings and sent them out to 41 nations it takes a long time to get their answers back. We have what's known as a six month's rule—you're supposed to reply within six months. But I'm afraid this isn't always possible and so occasionally charges are levied against us that our work is too slow.

Our overall technical policy is the responsibility of a Committee of Action consisting of nine members who are chairmen of national committees and these are elected periodically for this purpose, together with the officers of the IEC. At the present time I'm happy to say South Africa is on the Committee of Action.

We maintain a small but efficient staff at Central Office in Geneva responsible for the organisation of our technical work, meetings, working documents and so on, and the amount of paper sent out defies the imagination! We operate on an extremely small budget and this is the reason why we have such great difficulty in determining proper priorities. The demand for new work greatly exceeds our capabilities.

The benefit of all the work published to-date is freely available to engineers and users all over the world and, although much is taken for granted, there is, nevertheless, a growing appreciation among more enlightened engineers (which includes all South African engineers, needless to say!) of the important contribution to sound and economical electrical and electronic engineering practice that has been and is currently being made by the IEC. The publications of the IEC provide a guide to good practice, good performance, and ensure interchangeability—all factors of importance, not only to manufacturers and purchasers, but also to engineers in, for example, the supply industry and municipal undertakings.

I have here a list of some of the various technical branches but I won't bore you by reading all those out except perhaps to mention that it ranges on the one hand from electrical terminology to the very latest aspects of electronic engineering.

It is, of course, to be expected that the IEC, uniquely placed as it is in the international electrotechnical circles, should be expected to undertake other responsibilities than those I have described. As long ago as 1911 at the International Congress on the Applications of Electricity held in Turin we were asked to undertake the organisation of some future electrotechnical congresses. We did, in fact, arrange one but since it fell in 1915 it wasn't held for obvious reasons. Recently we've been a little less ambitious but I think rather more effective. The modern trend is to sponsor with other appropriate learned societies symposia, and we've had one recently in Baden-Baden on Magnetic Materials which was extremely successful. This policy we shall continue.

Another recent development has been the request initiated by the United States that the Commission should enter the field of quality assurance. As you know quality assurance is a highly developed art in South Africa and perhaps less well-developed in certain other countries. But so far there's been no attempt to undertake work of this character on an international scale.

I must make it clear that the intervention of the United States is not from any altruistic concept. Let me rather give you a little of the background to it. In the U.K. there has been what has been known as the BS 9 000 Scheme for quality assurance for electronic components both in the entertainment and the military fields. This is now getting under way and is becoming increasingly popular. It involves all those aspects of quality assurance with which you are familiar in the South African Bureau of Standards' mark scheme.

More recently three governments in Europe (U.K., France and Germany) got their heads together and decided to evolve a scheme for electronic components —first of all for operation in these three countries. They soon realised, however, that it would not be effective unless it were extended to some other countries and they wrote to me in my capacity as President of CENEL (one of these queer European bodies covering EEC and EFTA) countries concerned with harmonisation of electrical standards) asking whether we would undertake to operate such a scheme on their behalf. After endless meetings we eventually did agree to do so although this wouldn't be easy because ours was a voluntary body with no funds and no permanent secretariat. We had therefore to evolve a system whereby this would be self-supporting and provide its own secretariat. This has all been done and the scheme is now a practical one and will, I think, begin to affect manufacturers early next year. It's got to that stage already. As you can imagine it involved an enormous amount of detailed specification work and we've now established an inspectorate and the like.

This was all very well but you will remember that

it only applies to the EEC countries and the EFTA countries—thirteen of them. Of those I think nine are now members of this scheme; the others are sitting on the side-lines for the time being.

At the time I made two conditions with these governments; first of all, that if we ran it we ran it and no government interference; and, secondly, that we would only undertake it if it were clear that at some later date any larger power (and I had in mind the United States, Russia and Japan) wished to join in the scheme, then it would be the appropriate time to find some other more widely based international body to take the work on.

Well, we hadn't got going long before the United States began to describe this operation as a cartel and even ruder terms than that, indicating that this was a deliberate attempt to exclude the sale of electronic equipment from the United States in Europe. I can assure you this was not the intention but I failed miserably to convince the United States' people of this !

However, first of all they asked for some status in CENEL itself. I recommended that this should be done but my colleagues from France and Germany wouldn't wear it so we had to rebuff them, much to my regret. Then, of course, the United States decided to invite IEC (I come back to my original point) to enter this field with the object of closing down the CENEL operation. The present state of the art is that the IEC Council has agreed in principle that it will inaugurate such a scheme and it's under study at the moment. There will be no difficulty or conflict with the CENEL people because it was built into the constitution of this scheme that they would be prepared to hand over when they were satisfied that there was an appropriate international body able to take it over on a wider scale. Incidentally, both Russia and Japan now wish to join as well.

So you can take it from me that there will be, as far as I'm able to judge, an IEC scheme for the quality assurance of electronic components within the next year or two.

Having agreed that we should extend our terms of reference to electronic components we fully realise that we have now opened the door in principle to any other quality assurance scheme that may be demanded from us. So that in future we may be extending our activities to other types of apparatus.

Now no account of international standardisation would be complete, even if restricted very largely, as this paper must be, to one technology, without reference to safety. Over the whole field of product and system standardisation safety considerations rank among the most important. It is obviously desirable to ensure that the basic principles and general levels of safety requirements are similar over the whole range of IEC work. Accordingly, an Advisory Committee for Safety (ACOS) has been established by IEC and this is charged with the task of co-ordination of safety work in all our technical committees concerned with the many aspects of safety protection of persons and property.

The importance of international work on standards has always been recognised by those government departments which are concerned with industry and trade. But, more recently, non-technical governmental bodies such as the Economic Commission for Europe and the General Agreement on Tariffs and Trade have begun to show concrete interest in standardisation. We welcome this development provided, of course, that the government concerned recognises that our work is essentially technical and forms an integral part of development process in industry and, as such, must necessarily be directed by technical leaders of industry and science.

I hope that I've conveyed to you some impression of the important contribution that international standardisation has made and will continue to make in world affairs.

Finally, I would like to stress once again the considerable benefits to be derived from international standardisation work, particularly to municipal electricity undertakings and their engineers and to electricity supply authorities. It is perhaps not without significance that the United Kingdom member on the IEC Council i.e. the Chairman of the British Electrotechnical Committee, in other words, is deputy Chairman of the Electricity Council.

I look forward with confidence to greater South African participation in our work.

At the request of the President, Mr. A. A. Middlecote (S.A.B.S., Pretoria) expressed the thanks of the Convention to Mr. Goodall as follows :

Op versoek van die President spreek mnr. A. A. Middlecote (S.A.B.S. Pretoria) die Konvensie se dank teenoor mnr. Goodall soos volg uit :

It gives me great pleasure to propose a vote of thanks to Sydney Goodall for this address today.

I've always been very beholden to him and he does represent someone who is really au fait with the whole field of standardisation. His whole record is a classic one. As he himself pointed out it is essential for a standardisation man not only to be a practising engineer but also one versed in scientific investigation and research. This was the case of the first President of IEC, Lord Kelvin, and Sydney himself was engaged in industry before proceeding to higher honours. He was then intimately concerned with the first phase of standardisation which is the applying of commonsense rules to bringing order within an organisation;

in other words, company standardisation. He later became involved with BSI and was one of those who was able to weld companies and AMEU's, etc., into agreeing as to what should be the national standard, and so became seeped in national standardisation. Finally he has reached this high honour of virtually directing international standardisation.

His greatest strength, I might say, has been his diplomacy which is so vital in a world such as this. But I will also say that although he comes from a very democratic country, there's a soupçon of totalitarianism about Sydney—he knows just when to get a move on with the job and how to keep certain people on the right track! This is an essential technique which I am learning from him although I'm still a little hesitant about applying it too freely.

I think he too would stress the need for the respect of these different phases of standardisation for each other—national standardisation must not go to the extent that it interferes with certain requirements within the companies themselves, while international standardisation, on the other hand, should not go too far as regards national standardisation. The way should always be left open for an alternative approach, should it be necessary.

However, this works both ways and national bodies must not in turn look for peculiar excuses for not conforming like the aristocracy in England where it's the done thing to be different for the sake of being different. We are inclined as countries to look for something peculiar which marks us as different and here, in all seriousness, I would refer to the over-emphasis on the belief that we have a peculiar system of labour here that is **vastly** different from that in most other countries. We maintain that because we have Bantu workers who are not developed that we have to design things accordingly. Now this may be the case in certain instances but I think it is grossly overrated and interferes largely with what I've pointed out before to be essential for international trade, and that is to get agreement as far as possible on the essentials so that you can trade well.

I was going to say something about regional work but I think Sydney has covered that in his remarks about CENEL. He gave some figures and I'd like just to put it another way: although, through this growth of international exchange, world trade has gone up from about 155 000 million dollars in 1958 to 350 000 million in 1969 (which means world trade is doubling every eight years and since this is above the growth pattern of the world it shows that international trade is becoming more and more significant), the trade in electrical commodities has increased from 2 800 million in 1958 to about 11 000 million in 1969, signifying that it is doubling every five years. The trade in electrical engineering products is thus quite incredible.

I must also point out that under the able direction of the heads of the IEC the sale of documents purchased for use has gone up from about 55 000 in 1959 to 600 000 in 1969. In other words, this is doubling every three years and shows that countries are using them more and more. This is one reason why we have to keep in the game.

Sydney did not mention some of the details and I should like to mention a few of them. We're thinking in terms of products normally as regards international standardisation. The most important basic work is the exchange of products: that we know what we're ordering and what we're getting whatever country is concerned. But we also try and simplify the exchange of information which leads to the large amount of work done regarding what units we use.

Here let us with great pride remind ourselves that it was the electrical engineering profession that through the IEC started pushing for this magnificent new system known as the MKS—in other words, making the metric system something worthwhile—long before the rest of the bodies decided that this was a very good basis for the System Internationale. In fact, the IEC was virtually working to the System Internationale long before there was a general move towards it in the world.

Another important point is the value of words and what they actually mean. As we know different terms are used in different countries—even in the English-speaking countries: and this creates problems in the IEC. They've been trying to get this more or less correlated and I think there's going to be a solution soon. There is for instance the difference in terms between the American "grounding" equipment and the South African "earthing" equipment so that it's no wonder the Americans got onto the moon first since they were able to get a good "ground" point whereas the British would never have been able to "earth" there! (laughter)

Then, too, there is the vast amount of pooling of knowledge that comes out of the activities of the IEC. It's not just the blatant production of a standard but involves a lot of discussion and piecing together. Take for example, TC 64 which is Electrical Installations where we now have 12 working groups alone on the job. They've been remarkably rapid in their return of work which deals with particular problems in which we're all interested. One I would like to quote in particular is Working Group Four: Effects of Current Passing Through A Body. This Working Group has now practically finalised its work and for the first time in the world we've really got the consolidated opinion of world experts, both medical as well as engineering, as to what level fibrillation starts, the ideal curve and the value of the safe let-go current. This will be of enormous value to all of us who so frequently argue for hours in vain in our own committees as to

whether we've read Dalziel's paper or some doctor on the continent.

Finally, I'd like to try and clear up the issue of apparently always being on the carpet before you because either the manufacturers feel I'm being too kind to the users by making impossible specs or the users think we're kowtowing to the manufacturers. As I assured you yesterday this is not the case but it's a question of trying to weld together all these different bodies into one particular opinion that is in the national interests. I can assure you this is an incredibly difficult job when you have to sit on a committee consisting of manufacturers plus users plus scientific bystanders from anything from 20 to 40 countries. I myself have taken over a committee that's been hammered into some sort of discipline by Sydney, a fact which I appreciate very much.

Time is the most important factor here. Engineers and scientists always aim at ideals but one has to try and get them to do away with all unnecessary argument and concentrate on the basic facts because only by doing so can you hope to reach agreement within a period of two years. But if you wait until all the 'I's' have been dotted and the 'T's' crossed, it can take something like ten years.

In thanking Sydney for his address today, I also thank him for all the help he's been to me personally and per se to the South African National Committee in its work in the IEC.

Mr. H. Moore (Transvaal Education Department, Pretoria) addressed the Convention as follows :

Net 'n kort woordjie om namens die Transvaalse Onderwysdepartement vir u dankie te sê dat u ons genader het om daarmee 'n skakel te vind tussen u organisasie aan die een kant en die onderwys aan die ander kant. Ek kan u verseker dat ons dit baie hoog waardeer.

Vir drie dae het ek hier gesit en baie geluister en gehoor en geleer en ek voel nou amper soos die Boesmantjie wat hier by die Van Riebeeckfees was en toe hulle nou begin oppak om weer terug te gaan na die Kalahari, toe hy vreeslik tekere gegaan omdat hy 'n kraan wou saamneem dat hy dit net kan opdraai daar in die Kalahari om die water te laat loop ! (gelag) Nou weet ek nie wat ek met my kan saamneem nie maar ek is darem volgelaai met elektriese energie uit hierdie kongres. As ek by die huis kom en daar 'n gloeilampie vasbyt sal hy seker aan die brand gaan !

Mnr. die President, net 'n bietjie informasie en dit is dat in die nuwe onderwyspatroon wat nou hier om die draai lê voorsien ons dat daar heelwat voorsiening gemaak sal moet word vir 'n groot deel van ons leerlinge wat die skool verlaat en dan in die handel en nywerheid gaan werk in die dienste-sektor. Ek dink dit is waar u ook belang by sal hê.

U weet ons het een endpaadjie om ons vakmanne op te lei en dit is via die vakleeringskapstelsel. Ons het maar plus-minus tussen 35 000 en 40 000 vakleerlinge. Dit wissel so aan en af hier in die land. Jaarliks neem ons plus/minus 7 000 tot 8 000 varleerlinge in diens en dit is ook 'n wisselende faktor. Maar nou voorsien ons dat hierdie land van ons nooit voorsiening gemaak het vir die geskoolde werker nie. Dit is die groot persentasie leerlinge wat die skool verlaat en wat dan in diens geneem word en dan net as 'n werker begin werk.

Mnr. H. Moore (Transvaalse Onderwysdepartement, Pretoria) spreek die Konvensie soos volg toe :

Ons voorsien dat daar 'n stelsel moet wees van opleiding wat vir daardie persone 'n sekere geskooldheid gee dat hy daarna kan kwalifiseer as 'n geskoolde werker—nie as 'n vakman nie maar as 'n invulling tussen die arbeider miskien heel onder en die vakman aan die ander kant; net soos met die tegnikus wat tussen die vakman en die professionele ingenieur sal werk.

Dit is heel nuwe stelsel wat ons nou besig is om uit te werk. Ons het al met 'n paar organisasies hieroor gepraat en ons sal graag vir u organisasie vra om hieraan gedagte te gee. Daar is vandag 80% van ons mense in die vaardigheidsbedrywe en maar plus/minus 20% van ons mannekrag in die professionele bedrywe. Nou wil ons graag daardie 80% nog meer doeltreffend maak en daarom vra ons van u die een belangrike saak: dat u erkenning moet gee vir wat daar op die sekondêre vlak in die onderwys gedoen word. Indien ons daardie mense 'n mate van opleiding gee saam met hulle opvoeding, dan moet u daarvoor asseblief erkenning gee want daardie opleiding, alhoewel dit basiese opleiding is, is baie werd. Dit frustreer 'n kind as hy die skool verlaat en dan eers weer een trap agterwaarts moet gee om 'n halwe treetjie vorentoe te kan gaan. Ons vra u dat u daaraan tog asseblief aandag sal gee.

Mr. President, I want to thank you most sincerely for your hospitality. It's been both an honour and a pleasure for me to be here with you and I will report back to my Director that we have established yet another link between education and industry which will be to the benefit of both.

In thanking Mr. Moore for his assistance the President said :

Die President bedank mnr. Moore vir sy hulp en sê :

Ons is baie bly dat u gekom het en ek is seker dat ons nou 'n skakel gaan maak en met ons tegniese opleiding weer sal aangaan waar ons laas opgehou het.

FOURTH DAY

MORNING SESSION

Before proceeding with the programme, Councillor C. de Kock (Potchefstroom) was given permission to raise a matter of urgency. He said :

I read with interest in the papers this morning of the Convention at present being held in Stellenbosch on Pollution and Town Planning. We, Mr. President, have been extremely fortunate at this Convention to be addressed by an international figure such as Mr. Goodall; Dr. Straszacker from ESCOM who gave us a policy statement and was accompanied by Mr. Smit, his Manager, and there are delegates attending this Convention from as far afield as Rhodesia. Yet from the very beginning the Press has been conspicuous by their absence.

We are also represented here, Mr. President, by numerous affiliate members who, in this very important industry of electricity, represent millions of rand of material and manpower in this country. What I should like to know, therefore, is whether the Press have deliberately boycotted us or what reason they have for reporting nothing at all in the papers about this important Convention.

The President asked Mr. A. C. T. Frantz (Cape Town) whether he could explain the position as regards the Press and publicity and he advised as follows :

I had the Press in my office last week (all three papers—the "Argus," the "Cape Times" and "Die Burger") and gave them the agenda and a full run-down on it. They said they would report back to their news-editors and we had to leave it at that.

When we noticed, however, that they weren't here I asked Mr. Hess, my Deputy, to contact them again which he did only to receive the same reply.

Upon the News Editor of the Cape Times being personally contacted, he indicated that current news items having wide readership interests were such that there was no space available for reporting the Convention.

Mr. J. V. Grant, B.Sc. (Chief Scientist, Electrical Installations for Buildings Division, S.A.B.S., Pretoria) was then introduced and presented his paper entitled " Wiring Regulations and the Implications of Sensitive Earth Leakage Protection " which was published in Vol. 1 (a) of the 1971 Proceedings, and amplified certain items as follows :

First of all I'd like to point out an error in the printed paper on page 100: this should read : "In France the whole domestic installation is protected by a device rated at **300mA** . . ." and not 30mA, which makes quite a difference.

It's with some trepidation that I stand here talking

VIERDE DAG

OGGENDSITTING

Voordat daar met die program voortgegaan word, word aan Raadslid C. de Kock (Potchefstroom) toestemming om 'n dringende aangeleentheid te opper. Hy sê :

Die President vra mnr. A. C. T. Frantz (Kaapstad) of hy die posisie met betrekking tot die pers en publisiteit kan verduidelik en hy deel die Konvensie soos volg mee :

Toe die nuusredakteur van die Cape Times persoonlik genader is, dui hy aan dat lopende nuusberigte wat wye lesersbelang het, van so 'n aard was dat daar geen ruimte oor was vir berigte oor die Konvensie nie.

Mnr. J. V. Grant, B.Sc. (Hoofwetenskaplike, Afdeling Elektriese Installasies vir Geboue van die S.A.B.S., Pretoria) word hierna voorgestel en hy dra sy referaat voor onder die titel „ Bedradingsregulasies en die Implikasies van Sensitiewe Aardlekbeskerming," wat in Volume 1(a) van die Verrigtinge gepubliseer is en hy brei soos volg op sekere items uit :

to you when most of you have had a lot more to do practically and in other ways with earth leakage than I have, as I am relatively new to this subject. However, I do hope to stimulate some productive discussion.

1.—Introduction: As Mr. Goodall mentioned yesterday we would like to follow the IEC recommendations but, unfortunately, they are likely to take quite a long time and we can't wait too long because the "Blue Book" is getting very much out of date. However, now that we have a full-time staff we hope to keep this up to date.

2.—Wiring Regulations from First Principles (page 96): So what the IEC now have done is to establish a set of fundamental principles and up to a certain phase they have been published and are available for use by anyone in the world.

I attended one of the meetings at which Mr. Goodall presided as Chairman and I must say he was extremely good at knocking everyone into shape and this agreement on basic, fundamental principles is a very good first step.

TABLE 1: 1—Scope and definitions: You must obviously define what you're going to do and you must establish some definitions. These, of course, are built up and altered as you go along as is the case with any specification or set of rules.

2.—Fundamental principles: The part of Part 2 that have been published are:

(i) Protection rules
(ii) Design rules
(iii) Rules for selection of electrical equipment
(iv) Rules for erection and initial testing

3—General requirements for installations: This is where you get into a bit of contentious argument in the international scene and this is where we are in TC 64 at the moment. Part 3: Protection Rules is under discussion at present. A lot of it has, in fact, been more or less agreed but some of it still remains to be discussed at meetings next year.

You can see how all this has built up logically. Multiplying it out this means that you've got something like 80 sections, and at first sight it might seem that we're going to have 80 books! Once the rules are all sorted out, however, I think a lot of these sections will be condensed into a number of smaller booklets. But it will, nevertheless, be quite a big document eventually. I rather foresee that in South Africa we may, if we follow the IEC which we would certainly like to do, finish up with a large document and probably some kind of working book, similar to the "Blue Book" in many ways, which could be used by contractors and wiremen and the like. I'm afraid consulting engineers, if they want to know how these rules are devised and where they have come from, will have to read the whole book.

TABLE 2: This is already out of date as this paper was written early this year. The meeting of TC 64 was, in fact, held in September (1971) and it has now been greatly changed and very much simplified. Generally speaking, though, the principles are very much as shown here: you've got fundamental principles built up into general requirements for installations and these are applicable to all installations.

One change which might be mentioned is that there was some objection to the terms 'direct contact' and 'indirect contact' which people found a little muddling. So it was decided at the TC 64 meeting that 'direct contact' would be the term used with protection against shock in normal service, and 'indirect contact,' protection against shock in case of a fault. This comes to much the same thing but is merely putting the words in a different way.

5.—Earth Leakage Currents: (c) The other obvious point that arose from this survey was that there is no point in increasing the threshold current for tripping above 20mA from the point of view of nuisance tripping because you would only reduce your tripping faults by 5%, i.e. down to 20% instead of 25%.

If we take these figures as being reasonably valid we now come to the conclusion that if we protect the whole installation we are going to get trouble, nuisance tripping and all the other problems that arise in 25% of installations, and this is rather a lot.

6.—Sensitive Earth Leakage Protection: We had a look around the rest of the world to try and establish if and where these were compulsory. At the moment there is no country which installs a sensitive earth leakage protection device to protect the **whole** of the domestic installation. When I say 'sensitive' I refer to up to 30mA threshold tripping which is universally compulsory. From what we've heard so far it looks as though we shouldn't do this either.

Frankly, I'm not trying to push for sensitive earth leakage protection being made compulsory; the Bureau of Standards can't really do this anyway but in this paper I'm attempting to point out all the factors which should be considered in this connection.

(d) General: One valid suggestion is, I think, that we seriously consider overhauling our wiring rules and circuit design. Incidentally, this is also coming up at TC 64 based on questionnaires which have been sent out in connection with plugs and sockets. It's really quite amazing what a wide variation in conductor sizes are required to be connected to the socket in the different countries. This indicates that there is also a big variation in the type of wiring design of the circuit, and also the protection. Although this is interesting we haven't yet got to the bottom of it internationally and I think we need to take a good look at our own position.

I've gone here into the question of making earth leakage protection compulsory mainly because municipalities periodically raise this issue with me. They seem to expect me to issue the necessary instructions whereas **you** are the ones who deal with the regulations and therefore you should tell me !

7.—The Implications of Sensitive Earth Leakage Protection on Wiring Regulations : It will appear that the sensitive earth leakage unit is not of universal use as it cannot be used on certain circuits, i.e. certain supply conditions. On the other hand, it can—and in fact should—be used on other types of supply. This is merely to point out that one must be careful when introducing it into your wiring regulations to specify certain perameters to show that it cannot be used in every instance with success.

8.2—Conclusions : I should mention here that it was specifically brought out at the last TC 64 meeting that wiring regulations are not quite like the specification. A recommendation for a specification for a piece of apparatus could very often be adopted in toto and included into your own specification on a national basis. Wiring regulations, however, are a little different as here you are catering for all sorts of different conditions in different countries. The French, for instance, insist that they must recognise the earth-free room in a domestic house. Because of this we have the problem of using what is known as a Class I Appliance which is basically an appliance with normal insulation but with provision for earthing. The French refuse to allow this because if you plug an appliance with an earth into an earth-free room you are introducing an earth into that room. However, they have to get around this one way or the other and their general attitude is that they will change this Class I appliance to a Class 0 appliance which does not have provision for earthing.

Of course if you have two appliances in this room you could get a fault on the neutral on one and a fault on the phase on the other and you would then get a shock between them. They maintain that this is a very remote possibility but we don't agree with this in South Africa at all. As far as we're concerned there's no such thing as a permanent earth-free situation. You might get this in a hospital or other special application but for general domestic or industrial use earth-free is not considered a proposition.

However, you must allow for it internationally and this means when you come to your national rules, as was made clear in the TC 64 meeting, you need not take this word for word. You must adapt the principles if you can but not include every rule into your own national rules unless they fit.

Introducing discussion on Mr. Grant's paper, Mr. E. de C. Pretorius (Potchefstroom) said :

Ek wil heel aan die begin mnr. Grant hartlik gelukwens met en bedank vir sy weldeurdagte, geragteprikkelende en deeglik voorbereide referaat oor 'n baie „sensitiewe" onderwerp of liewers onderwerpe. Hy het nie alleen twee uiters kontensieuse sake, bedradingsregulasies en aardlekbeveiliging (of -beskerming) afsonderlik en gesamentlik aangevoer nie, maar ook, seker net vir die pret (in subparagraaf 7.2) 'n derde, nl. aarding bygehaal—drie heerlike onderwerpe waaroor daar lekker gesels kan word en, tenspyte van mnr. Grant se teregwysing, nog vir baie jare 'n „hardy annual" sal wees.

Bedradingsregulasies : Soos u almal weet was die SAIEI tot onlangs die opstellers en uitgewers van die Standaardregulasies vir die Bedrading van Persele (SRBP). Die eerste uitgawe, as ek my reg herinner, het in 1940 die lig gesien en in 1969 het die jongste en laaste wysiging van sekere regulasies verskyn. Die jongste algemene wysiging het in 1960 verskyn.

Die SAIEI (met die hulp van o.a. die VMEO en die SABS) het ons land 'n groot diens bewys deur vir bykans 30 jaar hierdie groot en uiters belangrike en verantwoordelike werk op sy skouers te neem. Elektriese installasies wat **streng** volgens hierdie regulasies bedraad is, is seker van die veiligste ter wêreld beslis

Mnr. E. de C. Pretorius (Potchefstroom) lui die bespreking oor mnr. Grant se referaat in en sê :

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baie veiliger as die oorgrote meerderheid installasies wat ek onlangs in Europa gesien het.

Ons sal eersdaags moet afskeid neem van die huidige SRBP, waarna ons, seker met 'n mate van deernis, verwys as die Blouboek (ten spyte daarvan dat die Afrikaanse uitgawe se omslag geel is!) Vir my sal dit met 'n mate van weemoed gepaard gaan. Nietemin, laat ons eerlik erken dat daar leemtes in die Blouboek is, dat dit hier en daar nie tred gehou het met die tyd nie en miskien in sekere opsigte konserwatief is.

Dit is feitlik aksiomaties dat SRBP die funksie van 'n nasionale standaardeorganisasie behoort te wees. Dit is dus verbasend, mnr. die President, dat die SABS nie reeds jare gelede hierdie funksie op sy skouers geneem het nie.

Nou dat hulle dit wel gedoen het, wag ons almal in 'n mate van spanning om te sien wat geskep gaan word. Ek hoop van harte dat dit, soos mnr. Grant dit stel, 'n hanteerbare en leesbare dokument sal wees. Ek het egter die volste vertroue in die SABS en veral mnr. Grant wat aan die spits staan van die verantwoordelike komitee en natuurlik die VMEO se verteenwoordigers op daardie komitee.

Mnr. Grant se benadering van die regulasies met

die uitgangspunt; Basiese Beginsels, vind ek baie interessant en onaanvegbaar. Daar moet myns insiens egter gewaak word teen **oor**vereenvoudiging van die probleemstelling en/of -oplossing wat moontlik tot verwarring kan lei.

'n Ernstige probleem wat volgens my mening gaan ontstaan as die bedradingsregulasies in 'n algehele nuwe vorm gegiet word, is dat dit 'n mate van verwarring gaan veroorsaak onder draadwerkers, veral die ouer garde, want hulle is nie almal ingenieurs nie, en dit hulle maande, selfs jare sal neem om vertroud te raak met die nuwe regulasies. Daar sal beslis voorsiening gemaak moet word vir 'n geleidelike oorskakeling van die ou na die nuwe regulasies.

Aardlekbeveiliging (alb.): Aangesien mnr. Grant se referaat in wese op huishoudelike installasies toegespits is, sal ek my opmerkings ook daartoe beperk.

Die **algehele** beskerming van 'n elektriese installasie deur middel van alb. was nog altyd by my 'n uitgemaakte saak gewees. Mnr. Grant het dit egter reggekry om my tot ander insigte te beweeg, veral met sy gegewens oor lekstrome in huishoudelike installasies, wat werklik 'n openbaring is. Ek moet nou, egter voorwaardelik, saamstem: dit is nie nodig om die stoof en warmwatertoestel met alb. te beskerm nie, op voorwaarde dat hulle affektief geaard is **en bly,** wat egter, veral wat stowe betref, nie altyd die geval is nie. Dan wonder 'n mens of dit nie miskien moontlik is om stowe so te bou dat aardlekstrome nie 'n probleem is nie sodat die stoof dan tog onder die beskermende vleuels van alb. geplaas kan word. Ek glo nie dis onmoontlik nie.

Ek kan egter nie met mnr. Grant saamstem dat ligstroombane van alb. uitgesluit behoort te word nie, ten spyte van die risiko dat 'n huis op 'n baie kritieke oomblik in donkerte gehul kan word—persoonlik dink ek die waarskynlikheid daarvan is so gering dat dit geen bekommernis hoef te wek nie.

Dit is absoluut skrikwekkend, mnr. die President, om te sien wat sommige mense by 'n ligsok aansluit: stryksysters, ketels, verlengingsgeleiers, selfs stowe! Dit word toegegee dat dit feitlik net by die ouer installasies met min of geen stopkontakuitgange gevind word, en dat dit volgens mnr. Grant, uitgesluit behoor te word van die verpligting om alb. te installeer. (Hieroor later nog enkele opmerkings). 'n Verdere groot bron van gevaar wat ligstroombane betref is die doen-dit-self-bedrading tussen die plafonlig en 'n bedskakelaar.

Mnr. Grant se bekommernis oor vrieskaste wat oor 'n naweek of tydens 'n vakansie buite werking gestel word deur alb. is nie te versmaai nie. Ek weet van 'n gesin wat, nadat die toevoer na hul huis tydens hul vakansie om 'n heel ander rede onderbreek was, nie slegs die inhoud verloor het nie maar ook nie weer die vrieskas in die huis kon inbring nie omdat die „aroma" onuitwisbaar was. Desnieteenstaande stem ek nie saam met mnr. Grant se voorgestelde oplossing van die probleem deur middel van spesiale stopkontakuitgange en -stroombane nie omdat dit gewis in menige gevalle nie die gewenste doel sal bereik nie—(la donna e mobile)—of tot wanpraktyke sal lei. As alternatief stel mnr. Grant voor dat die huisbaas sy vrieskas se inhoud verseker teen só 'n gebeurlikheid—moet egter nie vergeet om die vrieskas self ook te verseker nie!

Dit kom my voor of mnr. Grant huiwerig is oor die landwyse afdwinging van alb. en dat die vernaamste rede daarvoor die onsekerheid is oor die betroubaarheid van alb.—toestelle wat vandag op die mark verkrygbaar is, ten spyte daarvan dat hulle aan die toepaslike SABS-spesifikasie voldoen, tewens, die mark dra. Indien dit die geval is, mnr. die President, is dit vir my 'n ontnugtering en tas dit so effens my vertroue in die SABS aan.

Mnr. Grant doen aan die hand dat, indien alb. landswyd afgedwing word, voorlopig slegs nuwe installasies betrek word. Maar is dit dan nie juis die ouer en verouderde installasies wat meestal in 'n swak toestand is, met slegs enkele of geen stopkontakuitgange wat die oorsaak is van die meeste noodlottige ongelukke nie?

Om voor-die-hand-liggende rede sal die installering van alb.-toestelle in bestaande installasies met omsigtigheid gehanteer moet word en oor 'n lang tydperk moet geskied. Dit gaan beslis verreikende finansiële implikasies hê—dit kan moontlik politieke implikasies ook hê—veral as dit weens hoë staande lekstrome nodig is om 'n installasie te herbedraad of om verplaasbare toestelle om dieselfde rede te vervang. Daar sal baie mindergegoede mense wees wat dit nie sal kan bekostig nie. 'n Staatsubsidie lyk vir my die mees logiese oplossing, wat natuurlik nie vergesog is nie as 'n mens dink aan subsidies vir bv. gesondheidsdienste asook vry mediese dienste.

Opsommend sou ek sê dat die tyd ryp is (indien nie reeds oorryp nie) om alb. landwyd miskien voorlopig slegs op nuwe installasies alleen af te dwing maar daar moet nie baie langer getalm word om dit ook op bestaande installasies verpligtend te maak nie. Daar moet egter eers deeglik besin word voordat een of meer stroombane van alb. uitgesluit word. Tot tyd en wyl die nodige masjinerie bestaan om alb. af te dwing, moet daar intensiewe propaganda ten gunste daarvan gemaak word deur middel van die pers, radio en ander kommunikasiemiddels, asook deur middel van demonstrasies by landbou- en dergelike skoue, demonstrasies aan vrouevereenigings en so meer. As 'n oorkoepelende organisasie is die SABS myns insiens die aangewese om so 'n propagandaveldtog op tou te sit. Daar sal miskien gevra word hoekom ons Vereniging dit dan nie doen nie maar ek glo nie, mnr. die President, ons grondwet laat dit toe nie. Ek is ook seker die vervaardigers van alb.—toestelle sal gretig

wees om hulp to verleen.

Net een laaste gedagte: die probleem van lastige uitlinking van alb-toestelle as gevolg van staande lektrome sou oorkom kon word as die alb. toestel kon diskrimineer tussen staande lek- en werklike foutstrome. Ek verbeel my ek het êrens gelees dat daar reeds sodanige toestelle in Duitsland vervaardig word. Dit kan wees dat ek my vergis.

Discussion proceeded and the following contribution was made by Mr. E. B. Pike (Bethlehem) :

Die bespreking gaan voort en die volgende bydrae word deur mnr. E. B. Pike (Bethlehem) gelewer :

Firstly, regarding the wiring regulations: I consider that they are basically simple and effective but perhaps revamping them might have the good effect of streamlining them.

On earth leakage protection: the importance of indirect contact (as defined by Mr. Grant) is to me of prime importance, perhaps more so when one considers that ground resistance in the newer suburbs is gradually increasing with the continued use of plastic and asbestos pipes on the main water reticulation. In actual fact we have found places which previously had quite a good earth and insulation earth to neutral, the earth had suddenly become non-existent and the entire insulation had become alive with no fault on the insulation. As a net result of this we have discarded the earth to neutral system and installed earth leakage relays where these conditions do occur.

The occasions when a consumer could be without lights due to an earth fault caused by tripping of the earth leakage device are to my mind very infrequent and can be likened very much to an overload or a short-circuit on his insulation which is happening at present—the supply mains go out, the fuses or circuit-breaker trips and an electrician has to be called in to restore the power. However, in the three towns in which I've made this compulsory I've not had a single complaint to-date regarding the inconvenience of tripping at night.

One solution I've put forward for this problem—whether it's necessary or not is debatable—is perhaps a two-phase earth leakage unit or two single-phase units supplying into a split distribution board: the one section of the distribution board controlling lights and perhaps the freezer, if so desired, and the other sector, the stove, geyser and power points, etc. I don't think the expense would be excessive and if people really wanted this additional discrimination they could have this installed.

I disagree with Mr. Grant on his various suggestions as to what should be connected and what not connected to earth leakage. All three of the fatalities in my personal experience were directly attributable to lighting circuits. By this I mean not the mere touching of a bulb- or plug socket but where the lighting circuit itself was faulty resulting in the roof and sewer vent pipe becoming alive and causing electrocution on contact.

The other reason why I disagree with having earth leakage on a few selected circuits is that basically most of our troubles come from an insulation becoming alive through a fault in the main earthing. A plumber, for instance, may disconnect the earth wire and never put it back again or somebody may steal the copper wire for some or other purpose resulting in the whole installation becoming alive, sometimes not through a direct fault as such but through high leakage on an electric stove or geyser. I feel therefore that it is most important that the earth leakage should be on the complete installation although I appreciate that on large installations such as workshops, blocks of offices and shops this is difficult where you've got a multitude of devices and circuits. The only solution I have to this and one which we implement is the use of multiple earth leakage units. We advise the persons concerned to have these units installed, giving them the reasons for this, and nine times out of ten they accept the position and put up about six of them.

Another point which needs stressing comes about through reference made to the many fatalities over the last few years. I think it goes back further than that. I conducted a personal survey once on a random fifty installations comprising shops, garages, houses and so on and in these 50 installations 32 people had had personal experience of severe electric shocks at various times in their homes from stoves, kettles and so forth. Although these had not resulted in fatal injuries they were nevertheless pretty severe and sometimes close to being fatal. So I think cognisance must be borne not only of fatal injuries sustained but also light injuries which are virtually an everyday occurrence, as well as the more serious injuries which result from burns and falls caused by the reaction to such shocks.

What I do find very perturbing is the fact that safety precautions should be governed by the number of fatalities—or a specified number. To me **one** person being killed by a particular fault or lack of safety demands investigation into that aspect and a correction of it. I don't think one should wait until you get say a total of a hundred accidents a year before taking any action about it, but I feel very strongly that immediate steps should be taken to remedy this situation. As I see it, if a thing happens once it might be pure chance or a fluke; the second time is coincidence but if it happens a third time then something must be done about it.

Another point is that I think too much emphasis is placed on such details as whether the unit will work,

who will maintain them and whether they will still be in working operation six months or a year after they've been installed. However, I don't think that's really any concern of ours. Take as an example the motorcar industry: a motorcar in itself can be a very lethal weapon on the roads yet the dealer sells the car with all the necessary safety features in order. After that the onus of maintaining it and seeing that it remains safe is on the motorist himself.

Likewise with electrical installation: I feel that initially we must test the installation to ensure that the consumer has every protection possible and as such when we hand it over to him, the installation is perfectly safe and reliable. Thereafter he must maintain it. We do periodic checks on installations and in this manner earth leakage devices which fail are detected. We then get the consumer to attend to this.

Another point is that Mr. Grant makes mention of various earth leakage currents in overseas countries. But what he didn't mention there was the voltages of supply in these different places. In other words, America at 5mA for a swimming bath, I think I'm correct in saying that their standard voltage is 110 volts single phase at 220 and that some of the continental countries are much the same. That will affect the position here; our earth currents would naturally be high with the higher voltage.

In my opinion the position shouldn't be regarded so lightly but that a firm attitude and positive thinking in all aspects should be adopted towards this issue. I get the impression that Mr. Grant's paper has a rather negative outlook which disappointed me personally. I have been looking for support for earth leakage protection from various authorities for many years and I had hoped that the SABS would show a very firm and strong stand on this issue, particularly if one bears in mind the essence of the Factories Act which is the safety and welfare of the individual. I think, however, the emphasis is really on the safety of the individual and virtually every regulation has been formed with this in mind. If the wiring regulations then do not make provision for the incorporation of earth leakage devices, then I suggest the inspector of machinery give it his attention with the possibility of incorporating it in the Factories Act.

Mr. H. P. Smith (Benoni) continued the discussion and said :

In regard to the matter of the application of sensitive earth leakage protection to electrical installations, the decision as to whether the complete installation or specific circuits thereof should be included in the protected zone will be a matter of lengthy discussion at this Convention. When recommending the omission of lighting circuits from the protected zone, a note of warning must be sounded on the usage of metal wallswitch cover plates which could become alive. The obvious remedy is to use double insulated cover plates.

I do not agree with the author regarding his suggestion to solve the problem of the deep-freeze units and the loss of the proverbial six months' meat supply. Utility demands that the deep-freezer unit be fed by a flexible cord and this unit will therefore remain a portable appliance and be a source of electrocution. I offer here a possible solution to improve continuity of supply to the deep-freezer and still retain earth leakage protection of this unit. This could be achieved by educating consumers on better usage of the means of isolation already provided in their system. Before proceeding on a lengthy absence from their premises all power plugs of portable appliances should be withdrawn from their sockets and the double-pole insulators for the electric water heater and stove should be switched off, should these latter appliances be included in the protected zone. I know for a fact that these fundamental safety measures are not practised by consumers.

Mnr. H. P. Smith (Benoni) sit die bespreking voort en sê :

From experience we know that the major causes of so-called nuisance tripping and loss of deep-freeze meat are electric geysers, stoves and kitchen appliances left connected to the central circuit of the system.

There is one aspect of earth leakage protection which I feel cannot be left unheeded, particularly with the increased use of the multiple earth neutral (PME) system and it is this, that if the neutral circuit is earthed immediately upstream of the core balance earth leakage device, a neutral to earth fault immediately downstream of the protective device causes malfunction of this device. The reason for this is that the earth fault downstream presents a short-circuit across one of the primary windings of the core balance transformer. The short-circuit prevents a flux build-up in the magnetic core should there be an earth fault on the line conductor. This condition is analogous to the short-circuiting of the secondary winding of a conventional current transformer.

Two operational irregularities arise in a core balance earth leakage unit under these conditions. If the short-circuit loop is a practically zero impedance, flux build-up in the core is prevented and the relay will not trip under earth fault or load conditions. If, however, there is impedance in the loop, albeit of a transient nature, the relay will trip merely on load currents drawn through the core. This is a saving grace. As confirmed in practice, the relay invariably trips. The malfunction can be completely overcome by purposely adding a device in series with the neutral

conductor. This is mounted adjacent to the earth leakage unit and presents an impedance in the short-circuited loop. In this way flux build-up is not impeded and the core balance relay behaves normally.

Considerable effort has been devoted to the possibility of making available such a device which, whilst presenting the requisite short-circuit loop impedance, has the characteristic which presents negligible impedance to the load current. I still feel that one should look to the cause of the malfunction of earth leakage units rather than the cure.

The PME system to my way of thinking offers no advantage in the light of sensitive earth leakage protection and has disadvantages, particularly when one experiences a broken neutral on the supply side.

At this stage Mr. A. A. Middlecote (S.A.B.S., Pretoria) entered the discussion and said :

In hierdie stadium tree mnr. A. A. Middlecote, (S.A.B.S. Pretoria) tot die bespreking toe en sê :

Just a few cautionary words as this is likely to be rather a 'hot' discussion : it was Lord Henton who defined engineering as an art and not a science. Whereas in science there is only one answer to a problem, there are many answers to engineering problems and you have to bring to your forum of discussion even those that you may consider undesirable as far as your own opinions are concerned. In other words, you have to keep an open mind, and this is the art of engineering. And it is for this reason that one has to be very careful in discussing a subject such as this.

To digress, I might add that it's just as well the Press didn't turn up here today because if they heard Mr. Pike's figures there would definitely be a drop in the sale of appliances and everyone would be in a lot of trouble.

However, I must stress for his benefit that we must base our decisions on sound statistics, which was the point that Mr. Grant was making. You've got to get reliable figures and how often haven't we formed an opinion only to find that we've been given the wrong information and have taken it in good trust.

Let us, therefore, look at the figures that do exist and these show that the percentage of deaths due to electrocution are extremely low—lower in fact than anything else. We don't want to be dilatory about this but there is certainly no need to panic and we are doing a lot of good work. As Mr. Grant has stressed we can deal with this by observing our rules, by earthing properly. As he's just said this is a subsidiary one for the moment and until we've proven its trust let's not deviate from our good practice of earthing.

Take the stove as an example: some people maintain that cold hard figures prove that no one has been killed by a stove, quite apart from minor shocks; others again are horrified at having found stoves that are not earthed. This argument doesn't really hold water as one even finds earth leakage relays that aren't connected or aren't working and you simply have to rely on something.

You have to do your work of inspection, whether you inspect for earthing or to check the earth leakage relay which, after all, is a bit of engineering equipment which is subject to failure; it's not 100% reliable. Even with all the money spent on rockets in sending them to the moon failures are experienced! Far more so on a commercially produced product such as an earth leakage relay.

However, we do believe it is a wonderful thing. One mustn't interpret this as a negative attitude: it's merely a build-up attitude to ensure that we don't give something a bad name.

As I understand him, Mr. Grant proposes that we continue our good work in making sure that installation is good and apply earth leakage relays voluntarily wherever one can talk the customer into having it. But one should not force a customer to spend a lot of money if he feels that his insulation is good.

Mr. Grant says for the moment, unless someone can prove otherwise, socket outlets only—perhaps lights. The inclusion of the latter is still an open question and it's really a matter of whether the loss of lights can be balanced against the instances quoted by Mr. Pike. Here I'm inclined to agree with him that it might be better to include the lights as well.

Above all we must keep an open mind and not develop an exaggerated opinion of this. The idea is to introduce earth leakage relays gradually until one day if we can prove it, it will be the mastermind behind it all.

Mr. C. J. Calitz (Faculty of Engineering, University of Stellenbosch) contributed as follows :

Mnr. C. J. Calitz (Fakulteit van Ingenieurswese, Universiteit van Stellenbosch) lewer die volgende bydrae :

I would like to congratulate the previous speakers on what they've said in support of earth leakage protection. I should also like to add a few comments myself in this connection. Unfortunately, I, too, prepared a short piece in Afrikaans which I hope will be acceptable to Mr. Grant.

Hartlike gelukwensinge aan mnr. Grant vir die wyse waarop my in 'n relatief kort tyd die onderwerp met so 'n wye veld gedek het, insluitend 'n saak so polemies soos aardlekbeskerming. Veral sy voorstelle tot 'n geheel nuwe benadering i.v.m. bedradingsregulasies is besonder welkom, om dit aan te pas by moderne denke, metodes en tegnologie. Met ons huidige kennis behoort dit moontlik te wees om iets daar te stel wat **heeltemaal verskillend** en algemeen baie meer aanvaarbaar sal wees as dié in sy huidige vorm.

Ek wil myself verder graag bepaal by **aardlekbeskerming,** en kommentaar lewer oor sekere aspekte wat in dié verband deur mnr. Grant aangeroer is.

Die syfers wat in afd. 5 (bl. 98) bekend gemaak word i.v.m. die SABS-toetse gedurende 'n **„kort opname"** in huise op die Transvaalse Hoëveld en Natal, dui op lekstrome groter as 25mA in ongeveer 25% van die toetshuise. Mr. Grant added this morning that this would imply **spurious tripping** in 25% of the houses in which E.L.P. is installed. Certainly this is not correct. The figure of 25%, if accepted, is that of conditions which had accumulated over 10 to 50 years of service, and most of them to my mind must have been bona fide faults on each of the installations.

Ek wil hier graag my intense teleurstelling uitspreek oor die bekendstelling van sulke ontstellende syfers, sowel as dié in (a) en (d) op bl. 99 verdien meer sake die **getal, aard** en **omvang** van die toetse ook bekend gemaak word. Vanoggend het mnr. Grant hier gesê dit was maar „'n klein getal toetse." Hierdie syfers, sowel as dié in (a) en (d) op bl.99 verdien meer aandag, aangesien dit maklik tot misverstand kan lei.

Toetse wat in die verlede deur private instansies en plaaslike owerhede gedoen is op huishoudelike installasies in verskillende dele van ons land, het beslis nie hierdie syfers bevestig nie. 'n Groot munisipaliteit in die Republiek het bv. 'n paar jaar gelede sulke lukraak toetse op tussen 200 en 300 huise gedoen, wat 'n goeie steekproef verteenwoordig. Hul gevolgtrekkings was veel minder ontmoedigend as dié wat as SABS-resultate hierbo gegee word.

Minder as 1% van die huise het 'n lekstroom getoon van 25 - 30mA.

Slegs 0,5% van die huise het 'n lekstroom getoon van 20 - 25mA.

Slegs 2,3% van die huise het 'n lekstroom getoon van 15 - 20mA.

Met ander woorde, slegs in ongeveer 3,7% van die huise was die lekstroom groter as 15mA, dit ondanks die feit dat die opnames gedurende nat reënweer gemaak was. Baie interessant is gevind dat byna 55% van die toetshuise waarin die lekstrome kleiner was as 1mA was ouer as 25 jaar. In hierdie toetse was alle ligskakelaars in die „aan"- posisie, warmwatersilinders was almal „aan", en die elemente van alle stowe in elke sisteem is in beide koue en warm toestande getoets.

Opsommend : In die SABS-toetse sou 25% van die huise wat getoets was, aardlekrelês laat uitklink het as gevolg van lekstrome groter as 25mA, terwyl maar slegs 1% van die huise volgens ander uitgebreide toetse so getref sou gewees het. Ek verwys graag ook later na ooreenstemmende resultate wat in Frankryk verkry is.

Gedeeltelike in plaas van Volledige Beskerming : Ons het reeds die mening gehoor van mnr. Pike en mnr. Pretorius en ek wil hulle graag ondersteun. Voorstelle word deur mnr. Grant gemaak dat indien sensitiewe aardlekbeskerming verpligtend gemaak word, daar met die oog op die moontlike voorkoms van sporadiese gevalle van lastige uitklinkings, verkieslik besluit moet word dat slegs sok-uitlate beskerm word, en dat **stowe, warmwatersilinders en self ligte** voorlopig uit die beskermende bane weggelaat behoort te word.

Ek wil hier baie graag 'n ernstige beroep doen dat hierdie maklike uitweg nie gevolg moet word nie, veral aangesien ek oortuig is dat die aard en omvang van sporadiese klinkgevalle sodanig is, dat geen noemenswaardige beswaar daarteen kan bestaan nie. Toegegee die enigste moontlike uitsondering is dalk die vrieskabinet as gevolg van die besondere omstandighede wat daarvoor geld.

Maar so 'n uitsondering is slegs aanvaarbaar teen die agtergrond van die sielkundige oorwegings daarby betrokke, en natuurlik omdat dit kan lei tot skade en om die eenvoudige proses van die her-inskakeling van 'n hoofskakelaar uit te voer nie. Om hierdie moontlike probleem die hoof te bied sou ek graag voorstel dat 'n spesiale sok op 'n ongerieflike plek soos op die skakelbord beskikbaar gestel word waaraan die vrieskabinet slegs gedurende vakansie gekoppel kan word sonder gevaar dat dit dalk afgeskakel sou kon word as gevolg van die aardlekrelê of ander onderbrekings.

Aangesien die voorstel i.v.m. gedeeltelike in plaas van volledige beskerming na vore gekom het as gevolg van die moontlikheid van sporadiese of lastige uitklinkings, is dit vir my besonder jammer dat mnr. Grant on bl. 100 punt (b) slegs up 'n terloopse wyse melding maak van resultate wat in Frankryk bereik is en word. This morning Mr. Grant corrected the written part of his report and said the sensitivity figure of 30mA quoted should read 300mA. Unfortunately, this information is not correct :

Frankryk is 'n land waar in die algemeen die omstandighede vir klein aardlekstrome veel ongunstiger is as in die RSA—beide as gevolg van die gemiddelde ouderdom van sy huishoudelike elektriese installasies, en sy omgewingstoestande van lae temperatuur en hoë vogtigheid. En natuurlik as gevolg van 'n punt wat so pas deur mnr. Pretorius genoem is, nl. die hoë

vereistes wat in ons bedradingsregulasies gestel word.

Electricité de France het jare gelede die bul by die horings geneem en na die beste van my wete reeds meer as 100 000 aardlekrelê van 25mA sensitiwiteit in huise geinstalleer. Let op, 25mA, nie 300mA nie! Soos te wagte was daar aanvanklik probleme; die persentasie was egter maar laag—slegs in 4% van die gevalle is by installering probleme ondervind. Hiervan was 2/3 in vaste bedrading en semi-permanente installasies soos stowe, wasmasjiene en lig-armature waarin die fout baie maklik herstel kon word.

Om eestehandse kennis te bekom oor die geskiedenis vanaf voor installasie, het ek persoonlik ongeveer 50 verskillende aardlekrelês laat installeer in huise dwarsoor ons land. Hiervan is etlike reeds meer as 10 jaar oud, en 'n goeie 35 is in die Westelike Provinsie, die meeste waarvan reeds minstens 4 jaar in gebruik, o.a. in huise byna 60 jaar oud en met stowe meer as 30 jaar oud. Ek wil hier graag dit bekendmaak dat behalwe by eerste inskakeling wanneer bestaande foute in 'n klein persentasie gevalle probleme oplewer, en in gevalle waar die aardlekrelê self so 'n kort rukkie as gevolg van foutiewe werkverrigting pla, is die persentasie van gevalle van sporadiese uitklinking absoluut minimaal; in hierdie deel van die land in elk geval.

Na die beste van my wete is daar vandag in die orde van 500 000 sensitiewe aardlekrelês in die RSA in gebruik, die meeste waarvan onder direkte beheer van die mense wat vandag hier byeen is. Elkeen van hulle kan tog getuig, en 'n paar het nou reeds hier getuig, dat daar nie probleme van noemenswaardige omvang bestaan, soos waarteen die voorstelle van mnr. Grant gemik is nie. 'n Oordeelkundige opname sal mos in 'n kort tyd in die RSA hierdie bewering kan bevestig of weerlê!

Ons vereis vandag in ons bedradingsregulasies baie hoë isolasieweerstande, en in soverre dit apparaat soos elektriese stowe raak, sorg die SABS Spes. 153 dat toerusting ook aan hierdie vereiste voldoen. Die meeste vervaardigers in die RSA sien kans om aan hierdie vereistes te voldoen, en as hulle nie kan nie, wil ek 'n beroep op hulle doen om hulle van hierdie vervaardigingsbedryf te onttrek.

Die argument dat 'n apparaat soos 'n stoof min gevaar inhou, is moontlik so, maar dat dit geen gevaar inhou nie es verkeerd. Ek kan my die geval visualiseer waar 'n lekstroom of foutstroom van sê 200mA of groter deur die aardgeleier van 'n stoof weggelei word, en dat dit die dood kan vervoorsaak van 'n persoon wat die aardverbinding probeer losskroef en onderbreek om een of ander rede, of kontinuïteit probeer herstel, en dan 'n volle 220V oor twee van sy ledemate kry.

Wat dit betref is daar die alles-oorkoepelende grondslag in die elektrotegniek dat die volgehoue gebruik van (selfs gedeeltelike) defektiewe apparaat strydig is met alle beginsels i.v.m. die aanwending van elektrisiteit, en dit kan nie sterk genoeg afgekeur word nie!

Beroep: Ek wil op grond van die voorafgaande graag drie voorstelle maak vir oorweging by hierdie en/of toekomstige vergaderings van die VMEO en sy takke.

Voorstel 1: Ek het in 1967, ter voorbereiding van 'n lesing wat ek voor die SAIEI gelewer het oor „Verhelping en Voorkoming van Noodlottige Elektriese Skokke," 'n opname gemaak deur middel van 'n vraelys by byna 70 van ons grootste munisipaliteite in Kaapland. Ek het sonder enige gevaar vir teenspraak tot die gevolgtrekking gekom dat die meeste gevalle van teenkanting by plaaslike owerhede teen verpligte installering van aardlekrelês spruit uit afsydigheid, gebrekkige kennis en onkunde i.v.m. die werking van die apparaat. Om hierdie probleem die hoof te bied, wil ek graag aan die hand doen dat 'n kort kursus of simposium gereël word waarin die vraagstuk deeglik bestudeer, en beide teoreties en prakties uitgepluis word. Ek glo dat die universiteite in 'n uitstekende posisie is om so 'n kortkursus of simposium te reël, en ek sou graag namens die Fakulteit van Ingenieurswese (Elektrotegniese Dept.) van die Universiteit van Stellenbosch aanbied om so iets te reël indien belangstelling groot genoeg is. Dit sou in so 'n geval verkieslik die vorm van 'n kortkursus oor die verskillende aspekte van Aardlekbeskerming aanneem.

Voorstel 11: Van alle munisipale departemente is die elektrisiteitsafdeling die een, en dikwels die enigste, wat groot winste oplewer. Kan ons nie bietjie van hierdie winste terugploeg deur te besluit om op eie koste in sê 10% van ons huise gratis aardlekrelês te installeer, in alle gevalle waar daar nog nie voldoende getalle van die relês bestaan om die werking daarvan te ken beoordeel nie? Sodoende sal dit mos maklik wees om vas te stel of daar werklik rede bestaan om te glo dat aardlekrelês betroubaar is, en of daar dalk rede bestaan om te glo dat sporadiese foutiewe klinkings 'n bron van kommer kan wees. So iets sou met groot voordeel gedoen kan word deur enige instansie by wie onsekerheid bestaan, veral ná bywoning van 'n kortkursus soos hierbo deur my voorgestel.

Ek kan my voorstel dat daar teenkanting kan wees as gevolg van die tekort aan opgeleide personeel. Waarom kom ons nie tot die besef dat elektrisiteit van die meer gekompliseerde verrigtinge van munisipaliteite is, en dat ons ons personeelprobleem kan oorkom deur elektriese personeel dienooreenkomstig meer te betaal nie?

Voorstel 111: Ek wil graag 'n beroep doen op hierdie vergadering om asseblief nie te besluit dat gedeeltelike aardlekbeskerming van 'n huis aanvaarbaar, nodig of wenslik is, of in enige opsig gepropageer

moet word, alvorens daar sonder twyfel vasgestel is dat dit groot voordele en min nadele sal inhou nie.

Dit is my eerlike oortuiging dat beperkte aardlekbeskerming behalwe miskien op die vrieskas 'n terugwaartse en negatiewe stap sal wees !

Mr. P. J. Botes (Roodepoort) urged that no more time be lost before the provision of compulsory regulations for earth leakage protection. Mr. D. C. Plowden (Johannesburg) felt that there should be no relaxation of earthing requirements and deplored the tendency to permit the installation of appliances of doubtful design and safety providing an earth leakage relay is connected. Whilst agreeing that there were obvious advantages in basing the revision of the Wiring Regulations on the IEC regulations now being formulated, he regretted that this would result in the "Blue Book" being subjected to further ad hoc patching for the next four to five years. He referred to the desirability of improving the constructional requirements for earth leakage relay units in an endeavour to overcome the possibility of tampering therewith. He felt that instead of mandatory installation it would be advantageous to educate the public on the advantage of earth leakage relay but at the same time dispel the belief that their installation makes it impossible for a fatal shock to be received.

Mnr. P. J. Botes (Roodepoort) dring daarop aan dat geen tyd verspil moet word om verpligte regulasies vir aardlekbeskerming in te stel nie. Mnr. D. C. Plowden (Johannesburg) is die mening toegedaan dat daar geen verslapping van aardingsvereistes moet wees nie en betreur die neiging om die installasie toe te laat van apparate van twyfelagtige ontwerp en veiligheid op voorwaarde dat 'n aardlekrelê geïnstalleer word. Hoewel hy toegee dat daar klaarblyklike voordele verbonde is aan die basering van die hersiening van die Bedradingsregulasies op die IEK-regulasies wat nou geformuleer word, spreek my sy spyt uit dat dit tot gevolg gaan hê dat die "Blouboek" vir die volgende vier tot vyf jaar aan verdere adhoc-lapwerk onderhewig sal wees. Hy verwys na die wenslikheid daarvan om die konstruksievereistes vir aardlekrelê's te verbeter in 'n poging om die moontlikheid om daarmee te peuter, te bowe te kom. Hy is die mening toegedaan dat, in plaas van die verpligte installasie van aardlekrelê's, dit voordelig sou wees om die publiek op te voed insake die voordele van aardlekrelê's, en terselfdertyd die opvatting uit die weg te ruim dat die installering van 'n relê dit onmoontlik maak om 'n noodlottige skok op te doen.

Mr. J. A. Loubser (Benoni) contended that there was no such thing as "nuisance tripping." He believed that this only took place because of malfunction due to a defective earth leakage unit, now infrequent due to improved design. He pointed out that earth leakage units were disconnected by electrical wiring contractors technically or materially not equipped to locate faults thereon. Benoni was taking the step of investing in suitable equipment.

Mnr. J. A. Loubser (Benoni) spreek die mening uit dat daar nie so 'n ding soos „lastige uitklinking" bestaan nie. Hy glo dat dit slegs gebeur as gevolg van verkeerde funksionering wat aan 'n defektiewe aardlekeenheid toe te skryf is en dat dit nou al minder gebeur danksy verbeteringe in die ontwerp daarvan. Hy wys daarop dat aardlek-eenhede ontkoppel word deur elektrotegniese bedradingskontrakteurs wat óf tegnies óf materieël nie toegerus is om foute daarin op te spoor nie. Benoni doen tans stappe om in geskikte toerusting te belê.

Mr. D. H. Fraser (Durban) referred to the different conditions pertaining at the coast where high earth leakage currents were recorded on stove elements. He suggested that it might be advantageous to have isolation in the neutral circuit to make identification easier for the layman.

Mnr. D. H. Fraser (Durban) verwys na die anderster toestande wat by die kus ondervind word en waar hoë aardlekstrome by stoofelemente geregistreer word. Hy doen aan die hand dat dit voordelig mag wees om isolasie in die neutrale stroombaan aan te bring teneinde identifikasie vir die leek makliker te maak.

Mr. E. E. de Villiers (Rustenburg) referred to the Wiring Regulations and the revision thereof as follows :

Mnr. E .E. de Villiers (Rustenburg) verwys soos volg na die Bedradingsregulasies en die hersiening daarvan :

Eerstens wil ek net sê dat as een van die teenwoordigers wat op die komitee gedien het van die SABS is ek ook bly vandag om te verneem dat my kollegas tevrede is met die rigting wat die komitee nou inslaan om die regulasies te hersien. Ek wil darem die hoop uitspreek dat ons vriende van die SABS dit sal

moontlik maak dat ons die hersiende regulasies baie gou die lig kan laat sien.

Een ander opmerking wat ek graag wil maak is dat ons moet besef dat die munisipaliteite as sodanig en tot 'n groot mate natuurlik ook ons vriende van EVKOM die twee liggame is wat eintlik die voorsieners van elektrisiteit is, en die verantwoordelikheid dra vir die veilige gebruik daarvan deur die publiek, ons verbruikers. Ons moet altyd onthou en ons moet dankbaar wees dat 'n liggaam soos die SABS ons help om die regulasies op 'n baie goeie voet te plaas maar ons is nog uiteindelik die mense wat verantwoordelik gehou word dat krag veilig gebruik word. U het al 'n paar maal gehoor dat mnr. Grant in sy referaat dit genoem het dat dit 'n gevaarlike kommoditeit is.

Nou wil ek net graag vra dat ons vriende in die SABS wat wonderlike samewerking aan ons gegee het in die verlede, moet tog onthou om die samewerking in die geval van die hersiening van die regulasies nog baie breër na ons toe uit te brei want ons is, soos ek sê, die verantwoordelike mense.

Mr. E. Tarchalski (Heineman Electric (S.A.) Ltd., Johannesburg) commented as follows :

Over the past 10 years or so engineers were attempting to crystallise their opinions on earth leakage protection as such. I think that they have had quite a lot of experience with these devices installed in various forms and so forth; and the consensus appears to be that this type of protection is desirable or favoured.

It would seem that the gathering of responsible engineers here, on the one hand, favours this whereas Mr. Middlecote, I think, has conveyed an impression which is rather negative, and in his own words, now is the time to reconcile diplomatically these two opinions and to draw some solid conclusions on the subject.

In his remarks Mr. Middlecote also stated or conveyed the impression that there is a lot to be desired about the reliability of these devices. This is rather surprising but then perhaps the Bureau of Standards knows a lot more about these devices. If so, then, of course, there is good reason to revise the specification and improve it.

To-date I think hundreds and thousands of these devices have been installed throughout South Africa and if they were all that unreliable or suspect then this would surely have come to the attention of the responsible engineers.

As I understood him Mr. Middlecote also remarked that if a house owner felt his installation to be safe and sound, then he didn't need a relay. However, I think it is up to this body of responsible engineers—probably the largest such body—to make a decision as to whether additional protection should be added to the installation or not. This is not something that should be left to laymen.

Mnr. E. Tarchalski (Heineman Electric S.A. Beperk, Johannesburg) lewer soos volg kommentaar :

Mr. D. S. van der Merwe (Witbank) indicated his support for the compulsory installation of earth leakage protection devices.

Mnr. D. S. van der Merwe (Witbank) gee te kenne dat hy ten gunste is van die verpligte installasie van aardlekbeskermingstoestelle.

Mr. K. G. Robson (East London) commented as follows :

I think it's unfortunate that we seem to be moving towards a polarisation of very definite opinions which I don't think was the intention of this paper. We must guard against the situation where you get one strong block pushing for earth leakage relays and another element as strongly opposing it.

I would like to endorse Mr. Fraser's remarks with regard to this particular tripping problem but I would also like to make the point that there are a number of municipalities who have already made the installation of earth leakage relays compulsory. Surely we have now reached the stage of having a proving ground for these relays. The next logical step would be for these municipalities to make their experience over the past years and perhaps the next few years, available so that people like Mr. Grant can get their side of the operating picture. I'm sure that is really what both Mr. Middlecote and Mr. Grant are trying to achieve.

If these municipalities will accept the responsibility to make available this very important record of operating experience I'm sure that we will then be in a position to take the next step.

Mnr. K. G. Robson (Oos-Londen) lewer soos volg kommentaar :

Mr. A. A. Middlecote (S.A.B.S., Pretoria) said :

Mnr. A. A. Middlecote (S.A.B.S. Pretoria) sê :

I think there's been a misunderstanding on the part of Mr. Tarchalski: I didn't say that earth leakage relays were unreliable; I said that they are subject to normal reliability conditions just as any piece of equipment is. Also, I didn't say I didn't want these units; I said that we must not neglect the requirement for basic good design in electrical installations, as most others have interpreted it.

Before calling upon Mr. Grant to respond to the discussion, the President commented :

It's been interesting listening to this discussion from the rostrum but I think we should give it a bit more serious thought. The Bureau is not trying to be dogmatic. I think the whole idea is to let earth leakage find its rightful place in the Wiring Regulations because that's where it belongs. We must use our common-sense in approaching this problem.

Mr. J. V. Grant (S.A.B.S., Pretoria) then commented :

Obviously I haven't time to answer all the questions even if I could. However, one solution to a number of them is that electrocutions and safety in electrical installations is a matter of probabilities, and there's no getting away from this fact. According to Mr. Pike we should not wait until the number of fatalities has crept up to about a hundred a month or even a hundred a year. But I really think this is, in fact, what we must do. We must go on statistics and probabilities because this is the only thing that will guide us. Of course, we can start supplying electricity at zero volts and naturally zero current but this won't be much good to anyone. It's very safe, though !

As we increase our voltages we are going to get accidents; we can't possibly avoid them. Therefore it is purely a case of statistics I think and if we keep an eye on these, as we must do, we will be able in due course to sort out the sheep from the goats and decide exactly where we are going to apply earth leakage protection—if we ever do !

I did suggest in fun that the owner might insure his perishables in the deep-freeze and I hope it's not taken seriously by anyone.

Lighting circuits seems to be one of the contentious points. I don't think I actually said that we must not put these on earth leakage protection. I did say, though, that if people feel particularly strongly about this point we can omit them. But, by all means, let's include them if you wish. I would rather see this, particularly on old houses because they don't have socket outlets.

There seems to be some idea that the Bureau of Standards disapproves of earth leakage units in general. Well, this is certainly not my intention. However, there is doubt about the long-term reliability of these units and as Mr. Tarchalski said, if this is the case and people are worried about it, let's have another look at the specification. This point I think was brought up by Mr. Pretorius.

Mnr. J. V. Grant (S.A.B.S. Pretoria) lewer toe soos volg kammentaar :

Mr. Pretorius also mentioned the need to discriminate between leakage currents and standing leakage currents. After all, these are both you could say fault currents and should be detected in any case. Even a standing current can be dangerous and the job of an earth leakage unit is to detect this.

Nuisance tripping is a term that should perhaps be defined. I've not called it 'spurious' tripping because spurious implies something which shouldn't happen. Nuisance tripping is something which you would like not to happen but unfortunately does do so. So I think we have to keep to this term and, after all, it is rather a 'nuisance' when it happens !

Mr. Smith raised the question of the earth leakage unit not being able to discriminate when you get a short-circuit across the toroid of the unit itself across a short distance; in other words, of very low impedance. This, unfortunately, is so but I feel that these instances, although they do occur, are rare. As a manufacturer, can you solve it for us, Mr. Smith ?

I've been accused of being negative. Let's say that I'm just neutral which is what I ought to be anyway ! I've suggested that we stick to socket outlets but now the question of lighting circuits has been brought up. Now I've no axe to grind about lighting circuits except that I'd have a bit of a job in my own house because I've a three phase installation and all my sockets at the moment are on one circuit, so I'd need another unit or something and it would cost me quite a bit. However, there's no reason why this shouldn't be done in an ordinary single-phase installation.

I do feel quite strongly, though, that we can forget about hot water cylinders and stoves. I really don't see any reason for putting these on. The fact that we do not have fatalities on stoves I think proves the point. The fact that you will find stoves not properly earthed is undoubtedly true as well, but until we have troubles I'm all for avoiding them, unlike some people here ! This is my personal opinion and not that of

the Bureau of Standards.

Mr. Calitz raised the point that they have in France put in a great number of units on domestic installations of 300mA. Please don't forget that this does not protect against electrocution. The only protection that we see at the moment is around about 20mA to 30mA. This is not to say that you cannot possibly be electrocuted. You could hold two wires or two pieces of equipment, have 20mA passing through you, and after a while die of asphyxiation. But here again it's a case of probabilities and the probability of this happening is very, very remote.

Mr. Botes was hoping that compulsory earth leakage protection was just around the corner. Well, it still could be, you know! (laughter). Somebody has to make up his mind.

I don't agree with desensitising at all. If you have compulsory earth leakage I think this is a very dangerous practice.

There was a suggestion for deep-freezers of putting an extra socket not necessarily in the kitchen but on the main board so that you could plug in there and go away happily on holiday. This is a possibility.

Mr. Fraser of Durban mentioned having found up to 400mA on stoves. In Durban, Mr. Fraser, I found 2 amps leakage on one stove ! Mind you it just happened to be in Durban ! In fact, I've got 200mA on my stove which I haven't managed to get rid of yet.

We do have records of quite high leakages in Edenvale and Durban. I don't think we did Witbank and Springs. It rather seems to me, though, that this is not necessarily a coastal failing. You may find an extra one or two in a hundred at the coast and those have got to be put right if you are putting in earth leakage protection. Nevertheless, we still haven't had the fatality that we're looking for. I only hope it isn't me !

I hope Mr. Tarchalski is happy with the reply Mr. Middlecote gave him.

The question of old houses being problems was mentioned: as a matter of fact they are and they aren't. At Witbank we found festoons of ripcord in some of these very old houses with so few socket outlets, but no earth leakage. However, it's dangerous and we must appreciate that.

Mr. van der Merwe, we found a number of these cases too of the neutral being earthed beyond the earth leakage unit. This was very often a contractor who probably didn't know what he was doing or a do-it-yourself job. We found instances of this more or less everywhere we did tests.

The neutral fault does produce an out of balance and there is quite a tendency for the neutral earth leakage current to affect the earth leakage unit even if it is not protecting that particular circuit. This is because you get a rise in voltage of your neutral and, depending on what type of supply it is, you can then get currents passing through the neutral of other appliances and it takes quite a while to sort these out.

I do agree that double-pole switching would help here but I'm not too sure whether people would be able to cope with this. They'd just go around playing with the circuit breaker knobs like notes on a piano and get nowhere at all. I had wondered whether this was a proposition and as was said Mr. Barrie brought this up quite a long time ago. It's a thought.

I think we've reached the end but I do feel there are several ways of taking this from here. There is too much indecision and opposing factors here obviously for us to take a decision but if the AMEU as a whole feels that they would like to take this further before the next convention in two years time, now that we've stirred up the mud once again, something can, in fact, be done about it. The AMEU could approach us and we could get together and possibly form some kind of investigatory committee. There are various ways of going about this. I'm merely suggesting one to you and leaving it to you to do the pushing. I've done my best to try and stimulate you into action and I hope I've succeeded.

The Convention expressed its thanks to Mr. Grant for his most stimulating and thought-provoking address.

Die Konvensie spreek sy dank uit teenoor mnr. Grant vir sy hoogs stimulerende en gedagteprikkelende toespraak.

At this stage in the convention, Mr. J. G. Wannenburg (Department of Labour, Pretoria) answered questions relating to the interpretation of the Factories Act which had been submitted subsequent to his comments made at the Umtali Convention. These were reproduced in Vol. 2(a) of the 1971 Proceedings.

In hierdie stadium van die Konvensie beantwoord mnr. J. G. Wannenburg (Departement Arbeid, Pretoria) sekere vrae betreffende die vertolking van die Fabriekswet wat ná sy kommentaar by die Umtali-Konvensie ingedien is. Hierdie vrae is in Volume 2(a) van die 1971-verrigtinge opgeneem.

AFTERNOON SESSION

The afternoon session opened with the continuation of Mr. Wannenburg's contribution and at the conclusion he was sincerely thanked for his great assistance to all concerned.

The convention then proceeded with further discusion on Mr. Carter's paper, the first speaker being Mr. D. L. Condra (USCO Cable Co. (Pty.) Ltd., Vereniging). He commented as follows :

First I want to congratulate Mr. Carter on his paper. I think he did an excellent job and produced a very comprehensive report which obviously had quite a bit of research behind it. However, I think Mr. Carter's research was based on his investigations in Europe as well as the experience of the Cape Town Municipality.

We have found in the United States slightly different experience which I feel will be interesting to the Convention delegates and I'd like at this time to explain exactly what this experience has been with aluminium cables.

I had originally intended to put up a few technical details as to why these cables were used and quote some impressive reports, but I think the delegates have quite enough of that already, so to cut it short I'll just try to explain what the practice is there and let the delegates read the material available if they'd like to obtain copies from me.

In the United States now on underground distribution cables some 90% of them are aluminium. However, the practices there vary considerably from those explained by Mr. Carter as that practised in Britain and by the Cape Town Municipality.

The cable construction itself is composed of stranded aluminium, almost universally. For whatever reasons this apparently is both economical and practical. They also insulate the conductors with cross-linked polyethylene. These conductors are in single cone configuration and are laid directly in the ground for underground distribution. I have a sample here which may give a better idea.

This could be laid in multiple or twisted in 2, 3 or 4 conductors and then laid in the ground, but in no instance is it armoured or covered with any outer sheathing which is another significant difference from the type of cable that Mr. Carter has put forward in his report.

These cables have been installed in the United States for some 10 years—ever since the introduction of cross-linked polyethylene—and evidently have proved very well in service. Again, I'll refrain from quoting all the technical back-up on this but thousands of miles of this cable are installed every year and they

NAMIDDAGSITTING

Die namiddagsitting open met die voorsetting van mnr. Wannenburg se bydrae en aan die einde daarvan word hy van harte bedank vir sy groot hulp aan alle betrokkenes.

Die Konvensie gaan hierna voort met die verdere bespreking van mnr. Carter se referaat. Die eerste spreker is mnr. D. L. Condra (USCO Cable Co. (Edms.) Beperk, Vereniging) en hy lewer soos volg kommentaar :

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seem to have worked all right so far.

The United States went to aluminium for basically the same reasons that Mr. Carter put forward. It has a lower price and it has price stability. Once the engineers there had convinced themselves that they could change to aluminium at a lower price they set about discovering a workable system for jointing aluminium. The keynote really was simplification; they had to make their cables, their jointing techniques and their entire systems as simple as possible in order to keep the cost down. They are privately-owned industries, the utilities there, and to convert from overhead to underground at that time was highly expensive. This was well over 10 years ago when they were using ducts for all underground distribution. So they developed a system of direct burial using the cross-linked polyethylene.

For joining they use stranded aluminium, as I've said; they also use compression techniques. They evidently convinced themselves that the compression techniques would work. There are extensive heat-cycling tests now required of any aluminium connector that is approved by Underwriters' Laboratories in the United States. Once the connector gets the UL approval then the users there of aluminium cables have no qualms whatsoever about using it as it has to pass very stringent tests.

As I say, this varies quite considerably from Mr. Carter's findings and Mr. Prins' deductions on compression. I don't know the reasons for this. It's easy enough to find a few cases that fail but in the United States there are millions of joints in service that have worked for years and I would submit that this is the acid test.

The point raised by Mr. Prins regarding aluminium in compression joints was the tendency of aluminium to cold-flow. This is correct as aluminium does flow under pressure as in a compression joint. One method that has been developed to counteract this problem has been the development of a new alloy known as EEE (Triple E). This alloy has reduced cold-flow properties and has proved itself under operating conditions where ordinary aluminium would fail. It is now being used in everything from house wiring to

welding cable and is supplied in South Africa under license from the manufacturers in the United States.

In conclusion I think I should add that we could probably sit here and discuss the technical reasons and theory behind the use of aluminium; these arguments have, in fact, been going on for years. In the United States, though, there aren't many people arguing: they're using systems which have been proven and which work. Any letter to a utility company in the United States will bring the response of a testimonial as to how well these systems are working and the fact that they're installing more and more of them every year.

I submit, Mr. President, that since these cables are now available in South Africa and actually have been sold, that they offer significant savings over the types now being used. It's been shown that the American types of cable when compared to standard South African cables, can save some 30% over aluminium equivalents and some 50% over copper equialents. With the amount of money spent on cables every year in this country this obviously represents a considerable savings in the electrical reticulation systems.

I would be interested in any of the comments of the delegates. This was one of the reasons for my attending the Convention and I know that many engineers I've talked to are also interested in comments as to why or why not these cables should be used in South Africa.

Mr. A. H. L. Fortman (Boksburg) commented :

Mr. Carter said that in Cape Town when terminating cables in MCB's they merely round the end a bit (this on solid aluminium) tighten it down and it works satisfactorily. But in another part of his paper under "Mechanical Jointing" he advocates the use of a spring washer for jointing purposes. This seems to be in conflict with what he said concerning termination in the MCB's.

Mnr. A. H. L. Fortman (Boksburg) sê :

At a recent meeting of SABS 156 which is the proposed metrication of moulded case circuit-breakers it was pointed out that the terminals on these circuit-breakers were specifically made for copper conductors —the sizes given were for copper conductor sizes. I'd like Mr. Carter's comments on this as I feel that you can't terminate aluminium directly in a spring-loaded terminal.

Mr. P. J. Botes (Roodepoort) said :

Mnr. Carter het 'n interesante referaat gelewer wat baie insiggewend is. Net 'n woord van waarskuwing oor die gebruik van aluminium of gegolfde aluminium-omhulsel, oliegevulde kabels sonder 'n versterkingsband of enige pantsering. Hierdie kabels is uiters kwesbaar vir weerligstrale wat 'n gaatjie in die omhulsel slaan waardeur die olie dreineer. Groot

Mnr. P. J. Botes (Roodepoort) laat hom soos volg uit :

lengtes kabel kan dan aldus verlore raak.

Onlangs het ons in Roodepoort 1 500 meter lengte van 0,3 vk duim aluminium geleier kabel so verloor wat toe vervang moes word. Ek voel dus dat die versterkingsband en pantsering vir oliegevulde kabels van die allergrootste belang is in gebiede wat deur weerlig geteister word.

The next speaker was Mr. E. B. Martin (Eberhardt-Martin, Rooseveldt Park) who submitted the following contribution :

The factors regarding the use of aluminium cables have, I feel, been set out in a most logical and concise manner, and the very conciseness of the paper illustrates what detailed study and careful thought must have gone into its preparation. His conclusions on the use of aluminium cable, I feel, illustrate the aptness of the definition of an engineer as somebody who can do what most others can but at half the cost !

I would, however, like to comment on a few points raised in the paper. The price advantage of aluminium over copper is even greater than would appear from Figure 1. This gives the price per ton plotted against the year. But it should be remembered

Die volgende spreker is mnr. E. B. Martin (Eberhardt-Martin, Rooseveldtpark) wat die volgende bydrae lewer :

that aluminium is of course very much lighter than copper—the density ratio being 1 : 3.1/3. If allowance is made for the difference in conductivity then an aluminium cable of the same conductivity as copper would have only half the weight. Therefore the ordnance in Fig. 1 for aluminium could be halved to give a true comparison of the relative prices.

In Section 7.1 Mr. Carter deals with solid conductor aluminium cables but I do feel that the economies attributed to the use of solid conductors have been rather over-stressed. It is possible to obtain stranded aluminium conductor cables which have been very well compacted and shaped and, in fact, which give a space factor of about 95% as against the 100%

obtained with solidal cables. Moreover, it should be borne in mind that the drawing of aluminium wire is basically a cheaper process. Aluminium wire can be drawn at speeds of up to 10 000 feet per minute on machinery costing about R50 000, while solid aluminium conductors are extruded at a couple of hundred feet per minute on equipment probably costing ½ million rand. So it will possibly be found that with the development of aluminium cables and as manufacturers install improved techniques for compacting, that the price advantage between stranded and solid could very well change over. I would mention that the use of solid aluminium cables on the Continent is not anything like as popular as it is in Britain where a high degree of compacting is done during stranding.

The main case for the use of aluminium is, of course, economic and Figure 4 clearly shows the rapidly increasing savings which it is possible to obtain with cable size. In the smaller sizes there is not so much of a saving and this is where I feel difficulties also start coming in regarding the making of satisfactory connections. These are largely related to space problems such as described in the note on taking cables into street lighting poles.

These problems can of course be solved but I would, however, suggest to engineers who have not had experience with aluminium cables that they should start with the use of the larger sizes. This is where it is possible to obtain big economies and where jointing is easier. So don't run before you can walk !

On "Jointing" Mr. Carter points out that aluminium can be jointed using variations of all the techniques accepted for copper. However, he doesn't favour compression jointing based mainly on laboratory tests in the U.K. although he mentions that successful results are claimed in France.

The French have done a tremendous amount of work on aluminium cables and, as mentioned in the paper, were probably the first country to use them, having had some 6 000 km in service by 1950. For the past 20 years compression jointing has been extensively used in France with excellent results following the development of a method of crimping using a deep indentation while holding the ferrule within a special die to prevent spreading of the soft aluminium fitting and to ensure that pressure is directed onto the cable core so as to rupture the oxide film. With this method contact is not only below the indent itself but also around the periphery of the bore of the ferrule. By holding the outside of the ferrule one could drive the indent point almost right through the cable and still obtain sufficient contact and conductivity along the walls of the ferrule. This method of crimping is incidentally the only method accepted by the French Electricity Board.

It is of course possible to obtain satisfactory compression joints using almost any type of compression but the determining factor is the length of the joint required. On overhead lines where there is no space limitation hexagonal compression or a type of circular compression is normally used. There, for example, a joint on a 0,2 sq. in. conductor would have a length of about 18 inches. This, of course, is not acceptable on underground cables and the whole problem has been to reduce the length of the joint while still obtaining mechanical and electrical properties.

The jointing of aluminium cables by any method is subject to more rigorous criteria than copper cables but there is no doubt that this can be reliably done using correct fittings applied with the correct tools. Compression jointing on copper, for example, has been greatly abused by using any type of fitting with any type of tool, and, in fact, one hears quite a lot of discussion these days on the merits of a deep indentation or hexagonal compression in jointing copper cables. Experience has shown that either type is satisfactory; the one doesn't really have any advantage over the other, but people are tending to chop and change simply because proper attention has not been given to the use of the fittings and the tools.

One cannot take liberties with the jointing of aluminium but, as I've said, provided the proper fittings and tools are used there's no reason why good, reliable joints cannot be obtained. Tests and test results are very difficult to plan so as to simulate actual conditions in practice. There is an example in the paper of what is theoretically the wrong way to make a joint in aluminium and that is the method of putting these house service cables into meters with grub screws. Here you have a brass fitting surrounding the aluminium conductor and a limited contact area. But the fact remains that although connections of this type would fail rapidly on test, as described in the paper, these types of service connections do seem to be working in practice and I think that it is the practical results that count in the long run.

Responding to the discussion, Mr. Carter said :

Mr. Prins mentioned that the price of aluminium will rise with the commissioning of the Richard's Bay Refinery. This is no doubt true whereas at the moment the price of copper is in a position of oversupply. However, the copper-producing countries seem

Mnr. Carter antwoord op die bespreking en sê :

to take it in turns to have strikes and one cannot bank on the price of copper going any lower. As far as I'm concerned I feel that the technical merits of aluminium cable have been proved and the choice between an aluminium cable and a copper one is

really basically now an economic one.

I agree with Mr. Prins that the performance of a toxic flux is somewhat superior to that of a non-toxic flux. An inexperienced jointer would probably make a better joint with a toxic flux than with a non-toxic one, but once a jointer has become familiar with the correct procedure using a non-toxic flux and follows the jointing instructions, satisfactory results are attainable. As I think most engineers know, cable jointers are a law unto themselves; they have jointing instructions but quite often they seem to think they know better. As far as I'm concerned if they stick to the rules they should be able to get a good result.

Tensile tests taken on connectors soldered by Cape Town jointers using the non-toxic flux indicate that failure takes place at or above the 60% of the ultimate tensile strength of the conductor as allowed for in the ACE Report 17 for Compression Connections. On occasion the fractures occur outside but near the ferrule, probably indicating a measure of conductor annealing. The use of non-toxic flux for aluminium soldering is now a standard practice in the Area Boards of Great Britain.

Mention was made by Mr. Prins of possible damage to the installation of PVC insulated cables due to the pot temperature of the aluminium solder being approximately 320 degrees Centigrade. However, this temperature does not differ over much from the approximate pot temperature of 260 degrees Centigrade for solder used in copper conductors, and in Cape Town we've had no difficulties in this regard.

Cape Town has had no experience of the welding technique using the fusion of aluminium oxide powder. This method was developed in America primarily for use on round conductors on dry type cables, i.e. with polythene or cross-linked polythene insulation. I would prefer to obtain more evidence on its success with shaped aluminium conductors having non-draining papar insulation, before commenting further on this method of jointing.

It is regarded in most quarters that the bursting of a PVC insulated steel wire armour PVC sheath cable under short-currents in practice is no problem. PVC taped bedding is used in Britain and the Continent and it could be that the choice of an extruded bedding by the South African Bureau of Standards might have been influenced by the manufacturing facilities of South African cable manufacturers.

Mr. Prins mentioned that a copper connection should not be used ofr joining an aluminium to a copper cable because of extrusion of the aluminium out of the copper connection. It is not clear whether Mr. Prins was referring to crimped joints but soldered connections between copper and aluminium cable using standard copper ferrules have been used successfully for many years.

I'd like to express my appreciation to Mr. Prins for his studied and thought-provoking introduction to the discussion. I'd also like to thank Mr. Morrison for his contribution to the discussion in giving the Convention details of current British practice in the distribution field. I understand that Dr. Bramley, the author of Mr. Morrison's comments, is seriously ill in England and I'm sure, Mr. President, that you will join me in expressing best wishes for his speedy recovery.

Mr. Condra gave us some very interesting information on American practice: the use of cross-linked polythene insulation without any armour or sheath.

The question of sheathing of cables I think is quite a controversial one. In England at the moment there is a move towards getting rid of the earth screen but it's still merely at the thinking stage.

It's also interesting to know that compression techniques have been so successful in America. Normally the conductors are round and it could possibly be that the type of aluminium used is different to that used in South Africa and England, but it would certainly appear that good results have been obtained. He did mention that this new alloy (EEE—Triple E) has very much improved cold-flow properties and I'm sure this would be helpful as far as crimping is concerned.

As regards crimping: all the work in America has been done on dry type cable and I think there is quite a difference between crimping a cable with a plastic or elastomeric insulation and one with a paper insulation where you have a non-draining or other type of compound. However, I'm sure the coldflow possibilities of this alloy should be very interesting.

Mr. Fortman mentioned the MCCB termination. Here I must admit an error in my original paper: the single core cable does fit into the MCCB termination without any filling or anything like that. What I really referred to was that it had to be filed somewhat to get into the neutral block.

When I mentioned that mechanical connectors should preferably be springloaded I was referring more to tee-off tap connections in buried joints.

Mr. Botes mentioned his experience of lightning and its effect on cables as far as armouring, etc., is concerned. I'm afraid we've had no experience of that type of thing in Cape Town. We will soon be having more 132kV transmission lines linking our systems where we'll have lightning arrestors, but at the moment it's something new to us.

Mr. Martin gave us a good review of practice in France and I do agree with him that the type of compression joint that he mentioned where you do have some pre-compaction of the strands will perhaps be more acceptable than one that has not. Over in England when they were doing tests on stranded cables a great deal of diversity was found in the results between cables of different manufacture and different degrees of compaction. Certain fittings

which worked joining two conductors made by the same manufacturer would fail when jointed to cables of a different manufacturer. It seems the thinking in England at the moment is that perhaps paper insulated stranded cables should be compacted prior to crimping.

In clarification of certain points, Mr. F. J. Prins (S.A.B.S., Pretoria), commented :

Ter verduideliking van sekere punte sê Mnr. F. J. Prins (S.A.B.S., Pretoria) :

First of all, on the exothermic welding process all that work was done on what you call 'dry' insulation —cross-linked or PVC. I did sound a note of warning yesterday when I said that I doubted whether it would work successfully where you have oil-impregnated paper insulation. This applies even to other welding process like the MIG—the oil film does pose problems and actually this oil film also poses problems in soldering. Unless you get rid of this film you have problems getting proper consolidation with soldering.

As regards the form or shape of the bedding: actually our local manufacturers would have been very pleased had we introduced that alternative because it is cheaper, easier and one operation with the rest of the armouring process whereas normally at the present there are apparently only two tapes. In other words, the tape bedding is very much thinner than the extruded bedding, and apparently in handling the cable you can get what's called "bursting" of that form of bedding. This is what was reported to us from Europe in the light of which the committee had decided at that stage not to go in for it. Our manufacturers, however, are completely competent to handle that type and actually I think would have preferred it.

Appreciation was expressed to Mr. Carter for his excellent contribution to the proceedings.

Waardering word teenoor mnr. Carter uitgespreek vir sy uitstekende bydrae tot die verrigtinge.

At this stage Mr. J. S. du Toit (Roodepoort) was given permission to again address the convention :

In hierdie stadium word daar aan mnr. J. S. du Toit (Roodepoort) toestemming verleen om die Konvensie weer soos volg toe te spreek :

Allow me as a town clerk to express my appreciation of the way the Convention has conducted its business. I am satisfied that you have come here to work, and although you know how to let your hair down you really do work at your conventions.

I think you've also set an example to other institutions in getting papers by members of other institutions read at your Convention. I think we should have more of this cross-fertilisation of ideas, especially the town clerks in their positions as chief executive or chief administrative officers. I have the feeling that we live in a bit of a vacuum and that we haven't got the contact with other institutions that we should have.

This is something that could perhaps be rectified. I can, for instance, forsee a paper being read at one of your future conventions entitled, "Productivity Leakage Relays in the Organisational Set-up": similarly we could get one of the members of your organisation to read a paper to us on "The Earthing of Chief Administrative Officers"! (laughter)

Mr. President, during the course of discussions and a considerable amount of leg-pulling we have become aware of the problems which exist in certain places where O. and M. or related functions have been introduced. These problems arise basically from what we may call administrative "short-circuits," caused simply by rubbing people up the wrong way.

Die probleem van administratiewe kortsluitings, as ons 'n nuwe gedagte hier kan opper, word veroorsaak as gevolg hoofsaaklik van onopgeleide werkstudiebeamptes of werkstudiebeamptes wat 'n verkeerde benadering tot die werker het en wat nie met die departementshoof saamwerk nie. Stadsklerke, rade of raadslede wat hierdie werkstudiebeamptes as inspekteurs wil gebruik in plaas van vir hulpverlening aan die hoofde van departemente. As stadsrade nie die regte persone kan aanstel nie moet hulle liewers niemand aanstel nie.

Work study, Mr. President—i.e. organisation study and method study—requires specialised skills, best applied by a person who has a good grasp of the work content of the particular department. Local authorities who do not have their own training facilities may contact the Public Service Commission or the local government branch of the Institute of Organisation and Methods for training facilities.

Perhaps we will still witness the day when we also will have in South Africa an institute along the lines of the British Local Government Training Board. In the meantime, though, let us make the best use of what we do have even though this may mean only the purchasing of a set of O. and M. lectures from the Institute of Organisation and Methods. At least then when you come across an O. and M. investigator, work study officer or management services official, or whatever, who is not going about his job the right

way, you can then shoot him down as you should.

Dit is geen geldmakery hierdie aanbod van lesings wat beskikbaar is nie; daar word maar bloot gepoog om die koste te verhaal.

CLOSING SESSION

The closing session of the convention was opened by the President submitting proposals from the Executive Council to grant Honorary Membership of the Association to Past President Harry Turner, Past President Ronald Simpson and Messrs. Bob Leishman, Arthur Frantz, "Rossie" Rossler, Frank Stevens and J. F. Lategan. The proposals were received with acclamation.

Mr. G. C. Theron (Vanderbijlpark) referred to the granting of honorary membership to Mr. Harry Turner and said :

Our Constitution provides for the election by the Convention of Honorary Members who shall be 'distinguished persons whom the Association desires to honour for outstanding services.'

In terms of this definition Mr. Harry Turner, our immediate Past-President, fits the requirements admirably. His record with the Association stretches right back to 1931 when I was still a youngster at school. For many years he was the standard-bearer of the Association in Rhodesia and for this outstanding contribution the Association would like to honour him.

Mr. H. T. Turner was then presented with the insignia of Past President and Honorary Member.

Mr. C. Lombard (Germiston) referred to the granting of honorary membership to Mr. Arthur Frantz and said :

Mnr. Theron het alreeds die woordomskrywing van 'n erelid volgens ons Konstitusie gegee, n.l. 'n persoon wat homself onderskei het en aan wie die Vereniging eer wil betoon vir voortreflike dienste. Ek kan van geen ander persoon dink wat so 'n meer verdien as mnr. A. C. T. Frantz nie.

Mr. Frantz has been intimately connected with the Cape Town Electricity Undertaking since 1933. When he was first appointed City Electrical Engineer of Cape Town he followed in the footsteps of such illustrious engineers as Mr. George Swingler, Mr. Horace Eastman and Mr. Chris Downey. This was no easy task but he carried on the tradition established by his predecessors and he has left his mark on the Cape Town Undertaking.

The same can be said in regard to his services to this Association. I can remember the paper presented by him at a convention held in this city round about

SLOTSITTING

Die slotsitting van die Konvensie is deur die President geopen deur aanbevelings van die Uitvoerende Raad voor te lê dat Erelidmaatskap van die Vereniging toegeken word aan Voormalige President Harry Turner, Voormalige President Ronald Simpson en mnre. Bob Leishman, Arthur Frantz, „Rossie" Rossler, Frank Stevens en J. F. Lategan. Die voorstelle word met groot byval begroet.

Mnr. G. C. Theron (Vanderbijlpark) verwys na die toekenning van erelidmaatskap aan mnr. Turner en sê :

But we also want to remember and honour Harry for his work as President when Umtali opened the doors of hospitality to us and he carried the burden and responsibility known only to past-presidents and the Secretary. We want to thank him for taking us along the dark road of temptation to Vila da Manica and guiding us safely back to the lights of Umtali ! (laughter)

For all this, and the outstanding support of and long service to the Association, the AMEU wishes to honour him.

Die ordetekens van Voormalige President en Erelid word hierop aan mnr H. T. Turner oorhandig.

Mnr. C. Lombard (Germiston) verwys na die toekenning van erelidmaatskap aan mnr. Arthur Frantz en sê :

1951, which to my mind is still one of the finest ever presented at a convention of this Association.

Oor die jare het hy ook uitstaande dienste aan hierdie Vereniging op verskeie maniere gelewer, o.a. as lid van die Uitvoerende Bestuur. En ek twyfel nie die minste nie dat indien omstandighede dit moontlik gemaak het, die Vereniging eer aan hom sou betoon het deur hom as President te verkies.

I still think he managed to wriggle out of that one by retiring too soon ! Nevertheless, he has made amends by playing a large part in making it possible for us to hold our Convention this year in the beautiful city of Cape Town, an event to which we have all been looking forward and which we shall remember for many years to come.

It is my privilege and pleasure to support the proposal that Mr. Frantz be elected an Honorary Member of this Association.

Mr. A. C. T. Frantz was presented with his insignia of honorary membership.

Die ordetekens van erelidmaatskap word aan mnr. A. C. T. Frantz oorhandig.

Mr. K. G. Robson (East London) spoke in support of Past President Ronald Simpson's election as an honorary member as follows :

Mnr. K. G. Robson (Oos-Londen) praat soos volg ter ondersteuning van Voormalige President Ronald Simpson se verkiesing tot erelid :

It is a pleasure and a privilege for me to support the proposal that Mr. Ronald Simpson be elected as an Honorary Member of the Association.

It is fitting, I think, that Ronald Simpson's name be added to what is now an ever-growing list of distinguished past-presidents of the Association who have already been elected to Honorary Membership. You will remember that at Umtali two years ago Honorary Membership was conferred on five retired members. I think we might say rather those members who have now moved from the stage, as it were, to the wings. I feel there is always a tinge of sadness in the pleasure we feel in honouring members who have served both the Association and their profession with outstanding devotion.

I believe that implied in such an award of Honorary Membership is our acknowledgement of the not inconsiderable contribution of electrical engineers, both in the sphere of the electricity supply industry and also, of equal importance, in the sphere of local government.

Mr. President, Ronald Simpson has reached the end of a remarkable career with the Durban Corporation which has spanned 47 years, during which period he rose from being an apprentice in 1924 to become Electrical Engineer in 1954. I would say that probably the only blemish on his career as an engineer is the five years he spent in the South African or Royal Navy, though no doubt he would think otherwise !

For many years he's served this Association with distinction and I believe with a strong conviction of its importance and its value as an Executive Member, a member of the Rights of Supply Sub-Committee and, at the time of his retirement, as the Convener of the Technical Training Committee of the Association. I think it's true to say that the latter subject has been his special interest for many years. I can remember as far back as 1960 in his Presidential Address when he directed our attention to the importance of apprenticeship training.

I'm sure that I speak for you all when I say that we are delighted that Ronald is here with us at this Convention today and it is with sincere pleasure and with a sense of appreciation of his distinguished service that I now formally support his election as an Honorary Member of this Association.

Mr. R. M. O. Simpson was presented with the insignia of honorary membership.

Die ordetekens van erelidmaatskap word aan mnr. R. M. O. Simpson oorhandig.

Mr. D. C. Plowden (Johannesburg) referred to the granting of honorary membership to Mr. Bob Leishman who, unfortunately, was unable to be present at the convention. He said :

Mnr. D. C. Plowden (Johannesburg) verwys na die toekenning van erelidmaatskap aan mnr. Bob Leishman, wat ongelukkig nie by die konvensie teenwoordig kon wees nie. Hy sê :

After graduating from the Witwatersrand University as a B.Sc. in Electrical and Mechanical Engineering Mr. Leishman spent four years in England, mostly on research work with the Royal Aircraft establishment at Farnborough. His thesis which earned him a Master's degree was based on this work.

On his return to Johannesburg Mr. Leishman spent a short period in the wilderness of commercial enterprise and then in 1936 joined the Johannesburg Electricity Department because he felt it was in the sphere of municipal engineering that he could best serve his fellowmen, and he did just this for the next 34 years.

He became Deputy General Manager in 1954 and General Manager in 1964, a post which he held for the next five years.

I need not dwell on his contribution to municipal electrical engineering nor his ability for original and creative thinking. These were recognised widely in the circles of electrical engineers and others.

Almost alone he organised the 1944 Convention of this Association which was in Johannesburg, preparing the agenda and later compiling and editing the material for the Proceedings. The magnitude of this work will be realised when it is recalled that due to the intervention of World War II this was the first convention held since 1939.

It was in recognition of this and other work that in 1944 Mr. Leishman was elected an engineer member of the Association and, according to all the information available to me, he is the only person to have been granted this grade of membership before becoming a deputy-chief or a chief of a municipal electricity supply undertaking.

In 1964 he was elected to the Executive Council where he remained until his retirement five years later, representing it in the capacity of convener or member on a number of committees and sub-committees. That he never occupied the office of President of this Association is attributable to the introduction of biennial conventions, as a result of which one must be in office as President Elect for two years and then as President for the next two years and time was the enemy.

To conclude, I would like to quote the words of our immediate Past President who, when closing the Umtali Convention, said of Robert Leishman that he was a pillar of strength in the Executive Council and in the affairs of the AMEU and of the Highveld Branch in the Transvaal.

Councillor Eager accepted the insignia of honorary membership on behalf of Mr. Leishman.

Raadslid Eager neem die ordetekens van erelidmaatskap namens mnr. Leishman in ontvangs.

Speaking in support of Mr. "Rossie" Rossler's election as an honorary member, Mr. R. W. Barton (Welkom) said :

We have heard Honorary Memberships conferred in the last few minutes to what we might consider the 'big guns' of the Association, namely the big cities like Johannesburg and Cape Town, as well as the Past-Presidents and so on. But it's nice to know that we can also honour in this way what we might call the 'smaller guns' in the Association; although Wal can make a very loud noise if he has to, I can assure you! (laughter)

Mr. Rossler has been in municipal service as a town electrical engineer for many years. He started off in Ladybrand in 1933 where he had under his control two 75kW generators driven by suction gas engines. He started in a small way and over his long career he built himself up until at Kroonstad he ended up with 35 megawatts of steam power, which is quite a rise I think you will admit.

Wal, of course, has numerous claims to fame not the least being that he is a Vrystater ! But I think

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The President then presented Mr. .Rossler with his insignia of honorary membership.

Toe hy ter ondersteuning van mnr. „Rossie" Rossler se verkiesing tot erelid praat, sê mnr. R. W. Barton (Welkom) :

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that I for one will remember him most for his sincere dedication to his job. I have known him personally for many years and got to know him very well in 1949 when I first went to Welkom which was then just a few houses in the veld. Since then, of course, it's grown to three times the size of Kroonstad.

As I say, I've known him very well indeed and we were associated on the Highveld Branch, and Wal really at all times put his job first and foremost in spite of many other interests. I think the two municipalities that he worked for in his long career can be very thankful to have had his services.

Mr. President, Wal Rossler has also been active in the affairs of the Association. He's served on various sub-committees in the past, and was an active member of the Highveld Branch in which he served as secretary, vice-chairman and chairman in the usual way.

Die ordetekens van erelidmaatskap word hierna aan mnr. Rossler oorhandig by die President.

Mr. J. C. Waddy (Pietermaritzburg) referred to the granting of honorary membership to Mr. Frank Stevens and said :

Frank Stevens has been a close neighbour of mine for a long time.

I have a record of what he's been doing during his lifetime and I see his engineering career got off to a very good start because he served his apprenticeship and got his early training as an engineer in the Electricity Department, Pietermaritzburg! (laughter) That was from 1922 to 1933 after which he went to Alice as engineer in charge of the undertaking there. Of course, that was before the birth of many of the delegates here and without doubt all the ladies present here this afternoon ! (laughter)

Mnr. J. C. Waddy (Pietermaritzburg) verwys na die toekenning van erelidmaatskap aan mnr. Frank Stevens en sê :

From Alice he went to Ladismith in 1938 where he stayed until 1953 and then he left to go to Kimberley. Then a bit of a tussle seems to have taken place between Kimbreley and Ladysmith which resulted in his going back to Ladysmith in 1954. This time he was appointed as Electrical and Mechanical Engineer and not as merely Electrical Engineer, so it seems he must somehow have got a lot of 'mechanical' experience while in Kimberley !

He attended his first AMEP conference in Pietermaritzburg and this is now his 24th convention as there were none held during the war period.

He is a Fellow of the South African Institute of Electrical Engineers, as well as of the South African Institute of Mechanical Engineers and an Associate of the London Institute of Electrical Engineers.

He has contributed two papers to the AMEU and has done a great deal of work as Chairman of what has been known until just recently as the Natal Branch. Actually he was their first chairman and I'm sure got it off to a very good start because it's been thriving ever since. In that branch I'm sure he'll be sorely missed when he gives up his municipal career at the end of this year. If you were to look up the records of that branch you would find that Frank has done a great deal more talking than any other member and I don't know who's going to fill the bill when he goes.

Well, Mr. President, Mr. Theron has mentioned the qualications required for Honorary Membership and I hope I've said enough to show that he meets these requirements.

Mr. Stevens was presented with his insignia of honorary membership.

Die ordetekens van erelidmaatskap word hierna aan mnr Stevens oorhandig.

Mr. H. C. Dreyer (Paarl) spoke on Mr. Lategan's election as honorary member and said :

Mnr. H. C. Dreyer (Paarl) spreek die konvensie soos volg toe oor mnr. Lategan se verkiesing tot erelid :

Dié van die afgevaardigdes wat gister in die Paarl was sal verstaan waarom ek die afgelope tydjie 'n bietjie links laat lê het by die Vereniging. Ek kan u egter verseker dat my kontak met mnr. Lategan in sy hoedanigheid oor die twee jaar as Voorsitter van Kaapse Goeie Hoop tak taamlik volgehou was, en daar het ek hom baie deeglik geleer ken.

Almal het hier gepraat vanmiddag van die hoë standaarde wat gestel word om 'n persoon te kwalifiseer as erelid van die Vereniging. Daar is een aspek egter, mnr. die President, wat baie mense buite rekening laat en dit is die menslike aspek. U weet, soos ek mnr. Lategan geleer ken het, is hy een van die persone wat ons gaan mis by hierdie kongresse as ons hom nie sou erelidmaatskap gee nie. Mnr. Lategan is 'n persoon wat altyd, as niemand meer iets te sê gehad het nie, in staat was—al kon ons nie altyd die teorieë volg nie—om darem vir ons iets op die ligte luim mee te trakteer.

Wat mnr. Lategan se loopbaan betref, mnr. die President, het hy begin as 'n vakleerling in 1923 in dieselfde dorp waar hy in 1969 afgetree het as Elektrotegniese Stadsingenieur. Sy eerste pos as Elektrotegniese ingenieur het hy beklee in Moorreesburg waar hy aangestel was in 1929. Daarna het hy vir 'n tydperk van 1939 tot 1938 in die Boshoff as Elektrotegniese Stadsingenieur gewerk, en daar het hy sy Staat-sertifikaat verwerf, nog destyds onder die Mynewet.

In die tydperk 1939 tot 1955 was hy onderskeidelik Elektrotegniese Stadsingenieur van Brandfort, Ladybrand en Heidelberg en in 1956 het hy die pos aanvaar van Elektrotegniese-Ingenieur van Stellenbosch. Dit is waar ek hom leer ken het as Elektriese Ingenieur van die buurdorpe waar ons taamlik nou saamgewerk het.

Mnr. Lategan het in 1929 lid geword van die Vereniging van Munisipale Elektrisiteitsondernemings en vir die laaste twee jaar voor sy aftrede, nl. 1956 en 1957, was hy Voorsitter van die Goeie Hoop-tak van hierdie Vereniging.

Mr. Lategan was then presented with his insignia of honorary membership.

Mnr. Lategan se ordetekens van erelidmaatskap word aan hom oorhandig.

The convention was next addressed by Councillor R. M. Friedlander (Cape Town) who said :

Die Konvensie word hierna soos volg deur Raadslid R. M. Friedlander (Kaapstad) toegespreek :

Baie dankie, mnr. die President, vir die geleentheid om weer 'n paar woorde te sê. Ek het gedag dat ek vandag gekom het om te luister en nie te praat nie maar ek is bly om hierdie geleentheid te hê om totsiens aan die afgevaardigdes wat nog oorbly te sê en 'n veilige reis tuis aan u te wens. Maandag het ek 'n besondere groot woord van welkom aan u in die moederstad gerig en vandag spyt dit my om totsiens te sê Nietemin van wat ek gehoor en gesien het verstaan ek dat die afgevaardigdes die paar dae in die moederstad so geniet het dat hulle binnekort terugkom. Ons hoop ten minste so !

I feel I'm rather in the position here this afternoon, Mr. President, of the man who came to an ex-servicemen's dinner just after the war and said that the next time round he hoped to be in the "B and C Company." When asked to explain he said, "Well, I'll 'B' here when you leave and I'll 'C' you when you come back again!" (laughter)

That's precisely been my function at this Congress.

Unfortunately, though, my duties have been so arranged that the position has been somewhat reversed in that I was here when you arrived and I'm with you when you leave!

However, from all accounts this has indeed been a most successful Congress and one which must be benecial to the electricity undertakings of the various local authorities throughout this country and beyond our borders, and for that we must indeed be grateful.

I'm a firm believer in communication—dialogue as it is commonly termed today—in getting together and discussing problems and sharing our problems and our views and our ideas, thereby benefiting not only ourselves but all those with whom we come into contact. That is precisely the purpose of a conference such as this—a getting together of people from all over the country with different problems, different ideas and different solutions which are often found to be of practical application in the areas in which we live.

To the ladies, too, I would say that it has been a great pleasure having you here. I'm afraid we are just on the point of washing you out of the Cape Peninsula. However, those of you who went on the drive round the Peninsula this morning will have seen it at its most beautiful, but by tomorrow I fear it will be somewhat damp, wintry and dismal.

Mr. President, each and every one of you who have come to Cape Town from other areas are indeed welcome here. From the reports which I hear from my councillors and from the officials of our various departments, although unfortunately this is an all too rare occasion for me, I gather that they receive a tremendous reception and welcome wherever conferences of any nature are held in other parts of South Africa or beyond its borders. It is therefore a pleasure and a privilege for us in the mother city to be able in some small measure to reciprocate the hospitality which our delegates receive elsewhere. Again let me assure each and every one of you, ladies and gentlemen, how very welcome you are here. Kom maar weer; ons is altyd bly om u hier in ons moederstad te sien.

Speaking on behalf of the convention, Councillor M. P. Kotze (Springs) said:

Toe hy namens die Konvensie praat, sê Raadslid M. P. Kotze (Springs):

Dit is altyd 'n besondere plesier om dankie te sê, en veral in 'n plek soos die Kaap is dit natuurlik 'n groter plesier om dankie te sê.

Mnr. die Burgemeester, ons is deeglik bewus van die feit dat u gedurende die afgelope week 'n baie besige tyd gehad het om te veg om u kiesers almal op die kieserlys te kry en ons is dus baie bly dat u vanmiddag nog die tyd gevind het om hierheen te kom. Ons wil u verseker dat ons u teenwoordigheid hier vanmiddag baie hoog op prys stel.

Ons sê vir u dankie, mnr. die Burgemeester, dat u Maandagoggend vir ons so hartlik welkom geheet het. Ons sê vir u dankie dat u op daardie geleentheid Sy Edele die Adjunk-Minister so vriendelik en gasvry hier ontvang het en hom so laat tuis voel het hier in die Kaap. Ek meen hy is 'n Suidwester en hy ken nie hierdie gasvryheid van die Kaap nie! (gelag) Ons is diep beïndruk met die wyse waarop u hom ontvang het.

Ons wil vir u ook dankie sê, mnr. die Burgemeester, vir die aangename onthaal wat u Maandagaand vir ons gegee het daar in die Stadsaal. Ek wil u verseker ons het dit baie geniet.

Ons sê vir u ook dankie, mnr. die Burgemeester, vir u mooi beedskap hier vanmiddag. Ons kom alte graag weer Kaap toe al is dit dan nie om kongres te hou nie maar sommer om die Kaap se skoonheid te geniet.

Ons wil vir u dankie sê dat u Raad u Parkdepartement toegelaat het om hierdie saal vir ons so mooi te versier. U weet ons van daar anderkant die Hexrivierberge af kan miskien nie die skoonheid wat hier aan te bied is in die Kaap so goed nie en ons waardeer dit des te meer. Ons het seker meer daarna gekyk as na die sprekers en ons waardeer dit besonder baie. Ons sal dit sekerlik outhou en ek glo dat as ons volgende keer op Pietermaritzburg kom sal hulle moet uithaal om beter te doen as wat u by die geleentheid hier gedoen het.

Mnr. die Burgemeester, baie dankie vir die gebruik van hierdie saal en vir die meubels wat u vir ons beskikbaar gestel het.

In particular, Mr. Mayor, I would thank your Council for allowing Mr. Frantz and his Department to make all the arrangements for this Convention. I am sure that it would not have been such a great success if it had not been for them and I can assure you that we appreciate everything that they have done to make this a success.

I would be neglecting my duty, though, Mr. President, if I did not thank the hotels of the Cape, especially those in the near vicinity, for making the delegates feel so welcome and making them so comfortable in the Cape.

Ek is seker, mnr. die President, dat dit boekdele spreek vir die afgevaardigdes dat ons nie op 'n hongerstaking gegaan het hier in die Kaap nie. Dit is heelwaarskynlik toe te skrywe aan miskien die selfdissipline van die afgevaardigdes maar miskien grotendeels aan die goeie behandeling wat ons hier in u hotelle gekry het.

Ten slotte, mnr. die President, wil ek tog darem net namens ons Stadsraad van Springs aan u baie dankie sê vir die wyse waarop u onder baie moeilike

omstandighede hier voorgesit het by hierdie Kongres. Ons is deeglik bewus daarvan watter inspanning dit vir u moes gewees het, maar dit skitterende sukses wat u van die taak gemaak het is almal seker van bewus. Van Springs se kant af sê ons vir u baie dankie.

Mr. Mayor, in conclusion, thank you very much for the hospitality of the Cape. I can assure you that each and every one of us appreciate it very much.

The next speaker was Mr. John Morrison (Johannesburg who spoke on behalf of the affiliates. He said :

Dit is vir my 'n plesier om hier te wees by hierdie Konvensie in Kaapstad veral op hierdie aangename tyd van die jaar, en as ek bietjie rondkyk na die mense hier vandag, sien ek dat almal saamstem.

Mr. President, at previous conventions it has been my pleasure to perform for the ladies—figuratively speaking, of course ! (laughter) Your kind invitation to represent the affiliates on this occasion presents me with a wonderful opportunity to plug the theme which reads that, contrary to public misconception, we commercials are a clean-living, hard-working and thoroughly honourable bunch of spivs ! (laughter and applause) Much of this Convention has been devoted this time to matters of management and I'm somewhat surprised to find that so few contributions have been forthcoming from those whose daily task it is to sell superlative products at give-away prices to a bunch of suspicious morons who seem to suffer from the delusion that there must be a snag somewhere ! (laughter) Now these characters so encompass their contract requirements with a veritable thornbush of restrictions and heinous penalties that even the most stalwart of tenderers positively wilts at the prospect of securing business !

In order to avoid the problems that will arise out of late delivery we executives of electrical companies take the advice of Piet Botes and use every management aid available: daily we PERT madly and our co-ordinated motivation has reached such a high degree of perfection that invariably we invoice the material long before we deliver the goods or even receive the order ! (laughter)

To the municipal observer it might seem that the critical path of your affiliates is somewhat devious and sometimes proceeds downhill at a galloping rate. But I think it is accepted that we have one thing in common with you in that there is always the equivalent of the town treasurer at the end of the road moaning bitterly that your contribution to his funds is grossly inadequate.

Unfortunately any resemblance between our activities ceases henceforth: on the one side you have the harassed, brow-beaten, down-at-the-heel executive of an electrical company who spends every waking hour —and many of the remaining 16 !—trying to find ways and means of making a small profit; whilst his municipal counterpart, the electrical engineer, rests happily in the knowledge that the newly introduced

Die volgende spreker is mnr. John Morrison (Johannesburg) wat namens die geaffilieerdes praat. Hy sê :

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and highly complicated maximum demand tariff will bring in the shekels without anyone having the slightest idea how it works, let alone the programmer of the municipal computer !

Take for example my friend Fun Letcher: from 10 to 4 he resides happily in his office puffing away at his pipe whilst his every requirement is catered for by a glamorous and most voluptuous secretary—a girl, I might add, who, despite her small salary, somehow manages to get such a lot out of her dresses that is is sometimes difficult to look her straight in the face ! (laughter)

But then, Mr. President, I'm wandering from my own critical path. The whole issue is : why is it that the municipal engineer be so favoured whilst the slaves of commerce toil continuously without reward ? It can only lie in our respective methods of management.

I suggest here, sir, that it is the municipal electrical engineer who has divorced himself from the traditional system of Pyramid Control to adopt what is sometimes known as 'Cartwheel' Management. In this he locates himself at the hub of his empire and radiates his administration and largesse like the spokes of a wheel to the workers who toil at the rim. This has the considerable benefit that whilst those on the outside live their lives in a continuous spin, going round in circles, the mastermind at the centre lives a well-ordered and steady life.

Compare this direct and somewhat feudal system of management with methods employed by commerce today. Firstly we have the "Beehive System" which contrives to establish as many departmental cells as possible, each with its own manager who delights in the title of vice-president. Thus you may have the Vice-President Materials Movement, or despatch clerk, deeply involved in the Deputy Vice-President Staff Comforts, or telephone operator ! (laughter). In a vast departmental hive of this nature it's equally important that we have a large number of drones, sometimes referred to as directors ! (laughter) They do nothing all day except buzz around loudly keeping the girls happy !

At the other end of the scale we have a second form of management often called the " Mushroom System"; thus referred to because the basic principle is to keep the staff completely in the dark while showering them at regular intervals with loads of manure in order to promote growth of thought !

(laughter) It's important that the working conditions in this system be damp and dingy, and in such sleazy conditions money no longer talks, it merely sniggers, because one of the basic principles is that salaries must be maintained at the minimum in order to save the staff the embarrassment of tax deduction!

And finally, somewhere between these two extremes, Mr. President, we have a system whereby the company is run by committees. The Americans call this the "Huddle-huddle System" after their own brand of football where the participants gather in the middle of the field in a huddle whilst the leader issues a series of highly distracting and completely controversial instructions in an indecipherable dialogue somewhat resembling my Afrikaans! On the action word all players, except the one with the ball, rush off in different directions to tackle all and sundry.

Mr. President, we, your affiliates, have gleaned much benefit from this Convention. We have benefitted greatly from the excellent papers that have been presented. We have enjoyed once more the pleasure of meeting our friends and associates in the municipal field. In thanking you, sir, for the opportunity of being present, may I humbly suggest that we have now all reached our final huddle; that the last magic words have been spoken and that when you close this Convention we will dash off in all directions refreshed and rejuvenated, ready to tackle all and sundry and the many problems that our thoughtful subordinates have been saving for our return!

Speaking on behalf of the ladies, Mr. A. A. Middelcote (Pretoria) said:

I have one complaint to make before I start and that is that I don't think it very fair to ask me to talk after John Morrison. It's a bit of a dénouement now whereas I might have got away with it before him.

Seriously, though, Mr. President, I was very pleased and flattered when you asked me to talk on behalf of the ladies and consider it a real honour. However, I must point out that I don't talk unless I have a firm grasp of my subject! (laughter)

Feeling that I must ensure that I really understood these delightful creatures on whose behalf I must talk I've delved into the Classics where I unearthed some flattering descriptions and some not so flattering. However, I felt this old Latin quotation to be rather significant: "Ave femininae hil brachiae delabore sine manu sua cadere." Translated this reads, "Here's to woman! Would that we could fall into her arms without falling into her hands"! (laughter) This immediately explains that this is a creature of mystery, highly desirable but all-consuming.

My next step was to go as many of us do to good old William Shakespeare. He had a good knowledge of human kind and must surely therefore have a knowledge of women. Well, I did find something that could help a bit and that was something we all learnt at school, the Seven Ages of Man, which reads: "All the world's a stage, and all the men and women merely players: they have their exits and their entrances; and one man in his time plays many parts, his act consists of seven ages."

Obviously there must be a correspondence on the feminine side for each age of man and we will now examine them.

"At first the infant, mewling and puking in the nurse's arms."—This is the first lesson we learn as men: that our womenfolk know the best way to a man's heart is through his stomach. In other words, you must feed the beast!

Toe hy namens die dames praat, sê mnr. A. A. Middlecote (Pretoria):

"And then the whining school-boy, with his satchel, and shining morning face, creeping like snail unwillingly to school."—Why unwillingly to school? I think it's because he's destined to sit next to a stupidly-shanked, long-haired little creature, little knowing that this is but an embryo-form of someone he's about to learn of at school. He's going to learn of Eve and her apple (which he's only destined to savour at a much later stage in his life, we hope); of Helen and her face that launched a thousand ships (a feat which even the British Labour Government can't do these days!) and he's going to learn how this challenging can form into something very desirable and beautiful.

"And then the lover, sighing like a furnace, with a woeful ballad made to his mistress' eyebrow."—These days with Springbok Radio I suspect it would more likely be written to the eyebrow pencil, myself! It is here that we learn of the romantic side of the sex; it inspires us.

"Then a soldier, full of strange oaths, and bearded like the pard, jealous in honour, sudden and quick in quarrel, seeking the bubble reputation." It's here in our days of travail, when everything seemed to be going wrong, that we found a delightful W.A.A.S.I. or a W.A.A.F. or a W.R.E.N. or a S.W.A.N. waiting for us; or above all, a nurse when we really needed it, and we discovered that a woman was like a fountain of refreshment just when she was needed.

"And then the justice, in fair round belly with capon lin'd, with eyes severe, and beard of formal cut, full of wise saws and modern instances; and so he plays his part."—It's a tragedy that when we all become good judges of Eve's flesh we happen to own a thing like a 'fair round belly with capon lin'd'! Nevertheless, we have now become good judges of women; we've learnt too that no matter how scientific we are, the man in the moon isn't half as interesting

as the little girl in the sun ! (laughter)

" The sixth age shifts into the lean and slipper'd pantaloon, with spectacles on nose and pouch on side, his youthful hose well sav'd, a world too wide for his shrunken shank; and his big manly voice, turning again towards childish treble, pipes and whistles in his sound."

" Last scene of all, that ends this strange eventful history, is second childishness and mere oblivion, sans teeth, sans eyes, sans taste, sans everything."—Mr. President, it's at this stage that women really come into their own. Who looks to our dentures ? Who looks to our wigs ? Who looks to our glasses ? Who looks to our KH4? WOMEN !

Having now perhaps established the qualities that make up this delightful sex it now behoves me to thank you on their behalf. From which age do I talk, though ? I'm certainly not a 'slipper'd pantaloon,' nor do I have a 'fair round belly'; and since I've never tried to fight, I guess it must be as the 'lover' or, shall we say, the 'poet' that I attempt this thanks on behalf of the ladies. A few years ago Peggy Mitchell always used to prosose thanks in the form of verse so I have composed the following lines which might bore you but which I offer nevertheless :

" We girls declare our grateful thanks
to members here what'er their ranks,
for sumptious fare and lovely wine
and treatment rare 'midst Cape sunshine.
Our beasts were fed,
we reached their hearts
and yet no cooking on our parts !
The President was very firm
not hesitant during his term
to keep our husbands occupied
while we their wives were not so tied;
and spent our leisure on the beach
or had our pleasure out of reach !
The fairest Cape was really fair,
South-easter failed to spoil our hair,
dear Mr. Frantz switched off the fan.
We got our chance to get a tan
and thus enhance in eyes of man
the beauty that was always there.
Our hard-worked spouses now return
to flats and houses with hearts that burn
just as they did in earlier lives;
they're taking back re-conditioned wives !"

Mr. R. W. Barton (Welkom) then said :

This is usually one of these cliff-hangers at the last minute but at the last convention the cliff passed by before anything could be done and I'm not going to take the same chance this time. If you'll allow me one last word although after the two magnificent orations we've just heard, any last word from me is likely to be one of those famous last words !

On behalf of us all, Mr. President, I would like to thank you very much indeed for the magnificent job you've done. I'm sure that after your two years of hard work it is now with a feeling of relief that you will close your Convention knowing that it has gone off so extremely well. We appreciate it all the more coming as it does after your very recent surgery. I'm tired after having done nothing, so what you must be feeling like I can't imagine !

Mr. President, on behalf of all of us, thank you very much indeed for a magnificent job very well done.

Mnr. R. W. Barton (Welkom) sê hierop :

Concluding the convention proceedings, the President addressed those present as follows :

"Vir my persoonlik was dit 'n groot voorreg om as Voorsitter voor so 'n groot gehoor op te tree, en so 'n gewillige gehoor. Dit was geensins moeilik nie. U het dit vir my maklik gemaak deurdat die sprekers te alle tye bereid was om hulle bydrae te lewer.

I would like to thank Cape Town, His Worship the Mayor and Mayoress, for their kindness in receiving us on Monday evening; my own Council for allowing me to accept this office; Mr. Arthur Frantz, Ivan Hess and their staff for all the arrangements made; the Secretaries, Dick, Elaine, Brian and Joy, for all their support, without which I can assure you, gentlemen, it is impossible for a president to do his job.

Ter afsluiting van die verrigtinge van die Konvensie, spreek die President die aanwesiges soos volg toe :

En dan, dames en here, ons hartlike dank aan die KWV vir hulle bereidwilligheid om ons te ontvang gistermiddag—ongelukkig kon ek nie self teenwoordig wees nie; die Munisipaliteit van die Paarl en mnr. Dreyer vir die besoek aan sy elektrisiteitsbeheersentrum; for all the entertainment laid on for the ladies.

My personal thanks to my own staff in Springs for the wonderful job they have done in helping me to get this Convention and the preparations which have been made there; to Mr. Jack Waddy, our President Elect, for standing in for me yesterday afternoon and also his good lady.

And then, last but not least, I would like to say

thank you very much to my own wife. It was not easy for her to listen to all my complaints over the past few weeks and it is largely through her encouragement that I am here in Cape Town at all. Baie dankie, Dorie. (hearty applause)

Finally, I would like to thank Mr. Botha and his staff for the recordings. Mr. Mayor, ladies and gentlemen, I don't think much remains to be said at this stage. Dis dan my aangename voorreg, dames en here, om hierdie Konvensie as gesluit te verklaar en ek vertrou dat ons almal in goeie gesondheid weer in 1973 in Pietermaritzburg bymekaar sal kom en net so in suksesvolle konferensie in daardie stadium sal hê. Ek wens u almal 'n voorspoedige terugreis na u tuistes en mag u ook vanaand se onthaal geniet.

Met dié paar woorde verklaar ek hierdie 42ste Konvensie as amptelik gesluit.

VERENIGING VAN MUNISIPALE
ELEKTRISITEITSONDERNEMINGS VAN SUID-AFRIKA

GRONDWET

THE ASSOCIATION OF MUNICIPAL ELECTRICITY
UNDERTAKINGS OF SOUTH AFRICA

CONSTITUTION

1971

Die Vereniging van Munisipale Elektrisiteitsondernemings van Suid-Afrika

GRONDWET

1. Woordomskrywing.

In hierdie grondwet, tensy dit uit die samehang anders blyk beteken.

1.1 „konvensie" die konvensie van die Vereniging.

1.2 „lid" en „lidmaatskap" al die klasse van lidmaatskap waarvoor in hierdie Grondwet voorsiening gemaak word, maar sluit nie geaffilieerdes in nie.

1.3 „lidonderneming" 'n onderneming wat lid van die Vereniging is.

1.4 „onderneming" 'n plaaslike bestuur wat sake doen as 'n onderneming vir die verskaffing van elektrisiteit.

1.5 „raadsverteenwoordiger" die raadslid of bestuurslid van 'n lidonderneming, welke raadslid of bestuurslid sodanige onderneming verteenwoordig, 'n stem namens sodanige onderneming uitbring en 'n blanke is.

1.6 „Suid-Afrika" die Republiek van Suid-Afrika, met inbegrip van die Gebied van Suidwes-Afrika.

1.7 „tegniese vergadering" 'n vergadering van die Vereniging wat gehou word in 'n kalenderjaar waarin daar geen konvensie plaasvind nie.

1.8 „Uitvoerende Raad" die Uitvoerende Raad van die Vereniging.

1.9 „Vereniging" die Vereniging van Munisipale Elektrisiteitsondernemings van Suid-Afrika.

2. Herroeping van vorige Grondwet en datum van inwerkingtreding van hierdie Grondwet.

2.1 Die bepalings van enige grondwet van die Vereniging, tot dusver van krag, word hierby herroep, en hierdie Grondwet, soos van tyd tot tyd gewysig, is die enigste grondwet van die Vereniging: Met dien verstande dat hierdie bepaling nie afbreuk doen aan die geldigheid van enige optrede of besluit ingevolge enige bepaling van 'n vorige grondwet nie.

2.2 Hierdie Grondwet tree in werking vanaf die datum en tyd waarop dit deur die Konvensie aanvaar word.

The Association of Municipal Electricity Undertakings of South Africa

CONSTITUTION

1. Definitions.

In this constitution, unless the context otherwise indicates.

1.1 "association" means the Association of Municipal Electricity Undertakings of South Africa.

1.2 "convention" means the convention of the Associations.

1.3 council representative" means the voting member of the council or board of a member undertaking who represents such member undertaking and who is White.

1.4 "executive council" means the Executive Council of the Association.

1.5 "member" and "membership" means all the classes of membership provided for in this Constitution but does not include affiliates.

1.6 "member undertaking" means an undertaking who is a member of the Association.

1.7 "South Africa" means the Republic of South Africa and includes the Territory of South West Africa.

1.8 "technical meeting" means that meeting of the Association held in a calendar year during which there is no Convention.

1.9 "Undertaking" means a local authority carrying on an undertaking for the supply of electricity.

2. Revocation of previous constitutions and date of effect of this Constitution.

2.1 The provisions of any constitution of the Association hitherto in force are hereby repealed, and this Constitution as amended from time to time, shall be the sole constitution of the Association: Provided that this provision shall not affect the validity of any decision or action taken in terms of any previous constitution.

2.2 The provisions of this Constitution shall take effect from the date and time of its adoption by the Convention.

2.3 Die Afrikaanse teks is die Grondwet en die Engelse teks is die vertaling daarvan.

3. Stigtig en naam van die Vereniging.

3.1 Hierby word, ooreenkomstig hierdie Grondwet, 'n vrywillige vereniging met ewigdurende opvolging gestig, wat bekend staan as „Die Vereniging van Munisipale Elektrisiteitsondernemings van Suid-Afrika."

3.2 Die Vereniging be-oog geen winsbejag of enige ander geldelike voordeel vir sy lede nie.

3.3 Die Vereniging is bevoeg om, in sy eie naam en onafhanklik van sy lede, te dagvaar en gedagvaar te word, om roerende goedere of vaste eiendom of enige belang daarin of reg ten opsigte daarvan te koop of andersins te verkry, dit te hou, te bestuur en daaroor te beskik.

4. Doestelling van die Vereniging.

Die doelstellings van die Vereniging is :—

4.1 om die belange van ondernemings te bevorder en om met ander tegniese liggame saam te werk;

4.2 om munisipale raadslede, elektrotegniese ingenieurs en alle persone met belang in die bevordering en ontwikkeling van ondernemings bymekaar te bring en om wyer kennismaking en die wisseling van sienswyses te bevorder;

4.3 om konvensies en tegniese vergaderings te reël en te hou vir die lewering van verhandelinge, die bespreking van onderwerpe wat betrekking het op ondernemings en om aanbevelings te maak oor sake wat gemeenskaplike optrede verg;

4.4 om takke te vorm van ondernemings wat gemeenskaplike belange het;

4.5 om wettige stappe te doen wat raadsaam is vir die beskerming en bevordering van die regte en belange van lidondernemings en lede;

4.6 om te affilieer met, of lidmaatskap te verkry van die liggame waarop die Uitvoerende Raad besluit;

4.7 om die stigting van liggame buite die grense van Suid-Afrika wat soortgelyke doelstellings as die Vereniging het, te bevorder en om hulle tegnies en finansieël behulpsaam te wees op sulke gebiede as wat die Uitvoerende Raad dienstig ag;

4.8 om internasionale vergaderings van organisasies wat soortgelyke doelstellings as hierdie Verenig-

2.3 The Afrikaans version shall be the Constitution and the English version shall be the translation thereof.

3. Formation and name of the Association.

3.1 There shall be and is hereby constituted, in accordance with this Constitution, a voluntary association with perpetual succession, to be styled "The Association of Municipal Electricity Undertakings of South Africa."

3.2 The Association does not aim at any profits or other pecuniary benefits for its members.

3.3 The Association shall be capable, in its own name and independently of its members, of suing and being sued, and of purchasing or otherwise acquiring, holding, managing and disposing of movable and immovable property, or any interest or right therein.

4. Objects of the Association.

The objects of the Association shall be :

4.1 to promote the interests of undertakings and to collaborate with other technical bodies;

4.2 to bring together municipal councillors, electrical engineers and all persons interested in the advancement and development of undertakings and to promote wider contact and the exchange of views;

4.3 to arrange and hold conventions and technical meetings for the reading of papers and the discussion of subjects appertaining to undertakings, and to make recommendations on matters requiring common action;

4.4 to form branches consisting of member undertakings with common interests;

4.5 to take such action as may be lawful and expedient for the protection and promotion of the of the rights and interests of member undertakings and members;

4.6 to affiliate with or seek membership of such organisations as may be decided upon by the Executive Council;

4.7 to foster the establishment of organisations outside the boundaries of South Africa having objects similar to those of this Association, and to assist them technically and financially in such fields as may be deemed desirable by the Executive Council;

4.8 to organise or participate in international meetings of organisations having objects similar to

ing het, te organiseer of daaraan deel te neem en om in die algemeen die uitruiling van inligting met betrekking tot die voorsiening van elektrisiteit te bevorder.

4.9 om hom daadwerklik vir die bevordering van die opleiding van tegniese personeel te beywer.

5. Eiendomsreg van lede met beperking van aanspreeklikheid.

5.1 Geen lid of geaffilieerde verkry, op grond van sy lidmaatskap of geaffilieerde lidmaatskap, enige eiendomsreg, titel of eis ten opsigte van of belang in enige eiendom van die Vereniging nie.

5.2 Die aanspreeklikheid van enige lid of geaffilieerde van die Vereniging vir enige verpligting van die Vereniging is beperk tot die jaarlikse bydrae deur hom betaalbaar.

6. Lede en Geaffiilieerdes.

6.1 Die lede van die Vereniging bestaan uit ondernemings, ander organisasies en natuurlike persone wat blankes is en wat in Suid-Afrika geleë is of woon, en nieteenstaande die definisie in 7.2.2 die natuurlike persone wat by aanvaarding van hierdie Grondwet lede van die Vereniging is. Almal in Suid-Afrika wat by die aanvaarding van hierdie Grondwet lede van die Vereniging is, behou hul lidmaatskap.

6.2 Lede wat natuurlike persone is, word soos volg ingedeel :—

6.2.1 erelede;

6.2.2 ingenieurlede;

6.2.3 geassosieerdes;

6.2.4 assosiaatlede;

6.2.5 voormalige lede.

6.3 Die Uitvoerende Raad kan raadgewende, handels- en nywerheidsondernemings en tegniese liggame as geaffilieerdes toelaat. Sodanige geaffiileerdes kan by konvensies of tegniese vergaderings verteenwoordig word deur soveel verteenwoordigers as wat die Uitvoerende Raad vasstel, maar sulke verteenwoordigers is nie stemgeregtig nie.

7. Kwalifikasies van lede.

7.1 'n Onderneming is bevoeg om 'n lid van die Vereniging te word.

7.2 Die volgende is die kwalifikasies vir lidmaatskap van natuurlike persone :—

those of the Association, and in general to foster the exchange of information in the field of electricity supply.

4.9 actively to promote the training of technical staff.

5. Proprietary rights of members and limitation of liability.

5.1 No member or affiliate shall, by virtue of his membership or affiliation, have any proprietary right, title or claim to or interest in any of the property of the Association.

5.2 The liability of any member or affiliate of the Association for any obligation of the Association shall be limited to the annual contributions payable by him.

6. Members and Affiliates.

6.1 The membership of the Association shall consist of undertakings, other organisations and natural persons who are white and who are situated or living in South Africa, and, notwithstanding the definition in 7.2.2, those natural persons in other territories who are members of the Association on the date of the adoption of this Constitution. All members in South Africa as at the adoption of this Constitution shall retain their membership.

6.2 The membership of natural persons shall be classified as follows :

6.2.1. honorary members;

6.2.2 engineer members;

6.2.3 associates;

6.2.4 associate members;

6.2.5 past members.

6.3 The Executive Council may admit consulting, commercial and industrial undertakings and technical organisations as affiliates. Such affiliates may be represented at conventions and technical meetings by such number of representatives as may be determined by the Executive Council, but such representatives shall not be entitled to vote.

7. Qualification of members.

7.1 An undertaking shall qualify for membership.

7.2 The membership qualifications for natural persons shall be :

7.2.1 **erelede** is persone wat hulself onderskei het en aan wie die Vereniging eer wil betoon vir voortreflike dienste;

7.2.2 **'n ingenieurlid** is die ingenieur in algehele bevel van 'n lidonderneming, welke ingenieur die ondervinding en kwalifikasies besit wat vir die Uitvoerende Raad aanvaarbaar is;

7.2.3 **geassosieerdes:** een of meer assistent-ingenieurs in die permanente diens van 'n lidonderneming, wat die kwalifikasies en ondervinding besit wat vir die Uitvoerende Raad aanvaarbaar is, kan as geassosieerdes toegelaat word;

7.2.4 **assosiaatlede:** 'n person wat in bevel van 'n lidonderneming is, en wat nie oor die ondervinding en kwalifikasies beskik wat vir die Uitvoerende Raad aanvaarbaar is vir ingenieurlidmaatskap nie, kan as assosiaatlid toegelaat word;

7.2.5 **voormalige lede:** 'n ingenieurlid, 'n assosiaatlid of 'n geassosieerde wat ophou om 'n betrekking te beklee wat hom ingevolge subklousules 7.2.2, 7.2.3 en 7.2.4 vir lidmaatskap laat kwalifiseer, kan deur die Uitvoerende Raad as voormalige lid toegelaat word.

7.3 Afgetrede lede en assosiaatlede wat by die aanname van hierdie Grondwet as sodanig bekend gestaan het, word voortaan as voormalige lede beskou.

8. Toelating as lede of geaffilieerdes.

8.1 Aansoeke om toelating as lede of geaffilieerdes moet in die vorm wees en die besonderhede bevat wat die Uitvoerende Raad voorskryf.

8.2 Die Uitvoerende Raad kan lede en geaffilieerdes toelaat, maar nie erelede nie.

8.3 Erelede word op aanbeveling van die Uitvoerende Raad deur die konvensie verkies.

9. Ledegelde.

Lidondernemings en geaffilieerdes betaal die gelde wat die Uitvoerende Raad bepaal.

10. Konvensies en tegniese vergaderings.

10.1 Tensy daar, volgens die mening van die Uitvoerende Raad, buitengewone omstandighede bestaan, hou die Vereniging jaarliks 'n konvensie of 'n tegniese vergadering van lede en geaffilieerdes.

7.2.1 **honorary members** shall be distinguished persons, whom the Association desires to honour for outstanding services.

7.2.2 **an engineer member** shall be the engineer in overall charge of a member undertaking who has such experience and who holds such qualifications as are acceptable to the Executive Council.

7.2.3 **associates:** one or more assistant engineers in the permanent service of a member undertaking, who have such experience and hold such qualifications as may be acceptable to the Executive Council, may be admitted as associates.

7.2.4 **associate members:** a person in charge of a member undertaking who is not in possession of the experience and qualifications acceptable to the Executive Council for engineer membership, may be admitted as an associate member.

7.2.5 **past member:** an engineer member, an associate member or an associate who ceases to hold a position which makes him eligible for membership in terms of subclauses 7.2.2, 7.2.3 and 7.2.4, may be admitted by the Executive Council as a past member.

7.3 Retired members and associate members designated as such at the time of adoption of this Constitution shall be designated "past members".

8. Admission as members or affiliates.

8.1 Applications for admission as members and affiliates shall be in such form and shall contain such particulars as the Executive Council may prescribe.

8.2 The Executive Council may admit members and affiliates, but not honorary members.

8.3 Honorary members are elected by the Convention on the recommendation of the Executive Council.

9. Membership contributions.

Member undertakings and affiliates shall pay such monies as may be determined by the Executive Council.

10. Conventions and technical meetings.

10.1 Except where, in the opinion of the Executive Council, there are exceptional circumstances, the Association shall hold annual conventions or technical meetings of members and affiliates.

10.2 Die Uitvoerende Raad kan besoekers na konvensies of tegniese vergaderings uitnooi.

10.3 Die konvensie of tegniese vergadering vind plaas op die plek deur die konvensie bepaal: Met dien verstande dat, as spesiale omstandighede ontstaan, die Uitvoerende Raad die vergaderplek kan bepaal.

10.4 Die konvensie of tegniese vergadering behandel die aangeleenthede wat op sy sakelys verskyn. Enige lid kan 'n voorstel vir bespreking op die sakelys plaas.

Elke voorstel wat op die sakelys geplaas moet word, moet:—

10.4.1 binne die raamwerk van die Vereniging se doelstellings val;

10.4.2 minstens drie maande voor die datum van die konvensie of tegniese vergadering waar dit oorweeg gaan word, aan die Sekretaris/Tesourier voorgelê word;

10.4.3 die goedkeuring van die Uitvoerende Raad wegdra voordat dit op die sakelys geplaas word: Met dien verstand dat die bepalinge van hierdie subklousule nie van toepassing is op voorstelle wat deur 'n 2/3 meerderheid van die lede van 'n streekstak wat ingevolge klousule 23 saamgestel is, aanvaar is of op voorstelle wat skriftelik deur minstens 20 ingenieurlede en/of raadsverteenwoordigers ingedien is nie.

10.5 Die konvensie besluit oor enige saak wat die Vereniging raak, behalwe sake deur hierdie Grondwet aan die Uitvoerende Raad gedelegeer.

10.6 Die tegniese vergadering besluit oor enige tegniese aangeleentheid, uitgesonderd sake rakende hierdie Grondwet, die finansies van die Vereniging of beleidsake waarvoor raadsverteenwoordigers gesamentlik verantwoordelik is.

11. Stemming deur lede.

11.1 Elke lidonderneming is by die konvensie of tegniese vergadering geregtig op twee verteenwoordigers wat deur die lidonderneming benoem is en wat stemreg het. Een sodanige verteenwoordiger moet die raadsverteenwoordiger en die ander een 'n ingeniurlid, 'n assosiaatlid of geassosieerde wees.

11.2 Geen ander lid of verteenwoordiger het stemreg nie.

10.2 The Executive Council may invite visitors to convention or technical meetings.

10.3 The venue of conventions or technical meetings shall be determined by the convention: Provided that, where unforeseen circumstances arise, the Executive Council may determine the venue.

10.4 The convention or technical meeting shall deal with the matters on its agenda and with any unopposed motions not on the agenda. A member shall be entitled to place a motion on the agenda.

All motions to be placed on the agenda shall:

10.4.1 fall within the aims and objects of the Association;

10.4.2 be submitted to the Secretary/Treasurer not less than three months before the date of the convention or technical meeting at which they are to be discussed;

10.4.3 be subject to the approval of the Executive Council prior to being placed on the agenda: Provided that the provisions of this sub-clause shall not apply to motions adopted by a two-thirds majority of the members of regional branches constituted in terms of clause 23, or to motions submitted over the signatures of not less than 20 engineer members and/or council representatives.

10.5 The convention may decide on any matter affecting the Association except matters delegated by this Constitution to the Executive Council.

10.6 The technical meeting may decide on any technical matter which does not affect this Constitution, the finances of the Association or policy matters for which council representatives are collectively responsible.

11. Voting by members.

11.1 At any convention or technical meeting each member undertaking shall be entitled to two representatives appointed by the member undertaking and who have voting rights. One such representative shall be the councillor representative, and the other an engineer member, an associate member or an associate.

11.2 No other member or representative shall have voting rights.

12. Prosedure by die konvensie of tegniese vergadering.

12.1 Die President van die Vereniging tree by die konvensie of tegniese vergadering as voorsitter op of, in sy afwesigheid, die Aangewese President. In die afwesigheid van beide die President en die Aangewese President, kies die konvensie of tegniese vergadering 'n lid van die Uitvoerende Raad as voorsitter of, indien daar geen lid van die Uitvoerende Raad teenwoordig is nie, enige ander lid. Die voorsitter wat aldus verkies is, tree slegs by daardie konvensie of tegniese vergadering en tydens die afwesigheid van die President as voorsitter op.

12.2 Die beslissing van die voorsitter aangaande enige punt van orde of prosedure is afdoende.

12.3 Dertig stemgeregtigde verteenwoordigers van lidondernemings, wat behoorlik ingevolge klousule 11.1 benoem is, vorm 'n kworum.

12.4 Elke besluit van die konvensie of tegniese vergadering word by meerderheid van stemme van stemgeregtigdes wat teenwoordig is, geneem.

12.5 Daar word deur die opsteek van hande gestem, dog wanneer die konvensie of tegniese vergadering so besluit, word daar oor 'n besondere saak by wyse van verdeling of per geheime stemming met stembriefies gestem. Stembriefies moet van 'n geheime merk voorsien word.

12.6 As daar oor enige voorstel 'n staking van stemme is, word die bespreking daarvan verdaag en daar word weer, sonder verdere bespreking, oor die saak gestem, op 'n tydstip gedurende dieselfde konvensie of tegniese vergadering wat deur die voorsitter bepaal word.

12.7 Konvensies en tegniese vergaderings is vir die publiek toeganklik, maar die konvensie of tegniese vergadering kan besluit om enige saak in komitee te bespreek, waarna slegs stemgeregtigde afgevaardigdes die reg het om teenwoordig te wees: Met dien verstande dat die konvensie of tegniese vergadering enige ander persoon kan toelaat om teenwoordig te wees.

13. Die President en die Aangewese President.

13.1 Die konvensie kies 'n ingenieurlid as Aangewese President en sy dienstermyn strek tot by die volgende konvensie. Tensy daar 'n eenparige andersluidende aanbeveling van die Uitvoerende Raad aan die konvensie voorgelê word, word die Aangewese President by die volgende konvensie outomaties die President van die Vereniging, en hy beklee sy amp totdat sy opvolger die Presidentsamp aanvaar of totdat hy ophou om 'n lid te wees.

12. Procedure at convention or technical meeting.

12.1 At any convention or technical meeting, the President of the Association shall take the chair or, in his absence, the President Elect. In the absence of both the President and the President Elect, the convention or technical meeting shall elect a member of the Executive Council as chairman, or should no member of the Executive Council be present, any other member. The chairman thus elected shall act as chairman at that convention or technical meeting and during the absence of the President and the President Elect only.

12.2 The decision of the chairman on any point of order or question of procedure shall be final.

12.3 Thirty representatives of member undertakings duly appointed in terms of clause 11.1 and with voting rights, shall form a quorum.

12.4 Each decision of the convention or technical meeting shall be taken by a majority vote of those present and entitled to vote.

12.5 Voting shall be by show of hands, save when the convention or technical meeting decides that the voting on a matter shall be by division or by secret ballot. Ballot papers shall bear a secret mark.

12.6 In the event of an equality of votes on any matter, discussion thereon shall be adjourned and a further vote, without further discussion, shall be taken at a time during the same convention or technical meeting, to be determined by the chairman.

12.7 Conventions and technical meetings shall be open to the public; provided that the convention or technical meeting may decide to discuss any matter in committee, whereupon only delegates with voting rights shall be entitled to be present; provided further that the convention or technical meeting may permit any other person to be present.

13. The President and President Elect.

13.1 The convention shall elect an engineer member as President Elect, who shall hold office until the next convention. In the absence of a unanimous recommendation to the contrary from the Executive Council to the convention, such President Elect shall automatically become President at the next convention, and shall hold office until his successor assumes office or until he ceases to be a member.

13.2 Enige vakature in die amp van president of aangewese president word deur die Uitvoerende Raad gevul en die ingenieurlid wat aldus aangewys is, word beskou as die persoon wat by die vorige konvensie gekies is.

14. Uitvoerende Raad.

14.1 Die Uitvoerende Raad van die Vereniging bestaan uit :—

14.1.1 die President;

14.1.2 die raadsverteenwoordiger van die onderneming wat deur die President verteenwoordig word;

14.1.3 die Aangewese President;

14.1.4 die raadsverteenwoordiger van die onderneming wat deur die Aangewese President verteenwoordig word;

14.1.5 agt ingenieurlede, behalwe die reeds genoemdes, wat deur die konvensie verkies word: Met dien verstande dat elkeen van vyf streke, waarvan die presiese grense deur die Uitvoerende Raad bepaal word, deur ten minste een lid verteenwoordig moet wees.

14.1.6 die agt raadsverteenwoordigers van die ondernemings wie se ingenieurlede ingevolge subklousule 14.1.5 tot die Uitvoerende Raad verkies is.

14.2 Alle lede wat ingevolge subklousules 14.1.1, 14.1.3 en 14.1.5 verkies word, word in hul persoonlike hoedanighede verkies en nie uit hoofde van die ondernemings wat hulle verteenwoordig nie.

15. Ampstermyn van die Uitvoerende Raad, toevallige vakatures en ko-optering.

15.1 Die Uitvoerende Raad dien as sodanig totdat 'n nuwe Uitvoerende Raad by die volgende konvensie verkies is.

15.2 Indien daar 'n vakature in die Uitvoerende Raad onstaan, vul die Uitvoerende Raad die vakature.

15.3 Die Uitvoerende Raad kan, mits minstens tweederdes van die stemgeregtigdes op 'n vergadering daarvoor stem, enige persoon ko-opteer om vir 'n besondere doel in die Uitvoerende Raad te dien. So 'n persoon se lidmaatskap van die Uitvoerende Raad eindig by die eersvolgende konvensie, tensy dit vroeër deur die Uitvoerende Raad beëindig word, maar hy kan daarna weer geko-opteer word. So 'n persoon

13.2 Any vacancy in the office of President or President Elect shall be filled by the Executive Council and the engineer member thus appointed shall be regarded as the person elected at the previous convention.

14. Executive Council.

14.1 The Executive Council or the association shall consist of :—

14.1.1 the President;

14.1.2 the Council representative of the undertaking represented by the President;

14.1.3 the President Elect;

14.1.4 the council representative of the undertaking represented by the President Elect;

14.1.5 eight engineer members, other than those already mentioned, who shall be elected by the convention:
Provided that not less than one of the said eight shall represent each of five regions, the precise boundaries of which shall be determined by the Executive Council.

14.1.6 The eight council representatives of the undertakings whose engineer members are elected to the Executive Council in terms of sub-clause 14.1.5.

14.2 All members elected in terms of sub-clauses 14.1.1, 14.1.3 and 14.1.5 shall be elected in their personal capacities and not in relation to the undertakings represented by them.

15. Period of office of Executive Council, casual vacancies and co-option.

15.1 The Executive Council shall hold office until after the election of a new Executive Council at the next convention.

15.2 Should a vacancy occur in the membership of the Executive Council, the Executive Council shall fill such vacancy.

15.3 The Executive Council may, by not less than a two-thirds majority of those present at the meeting, co-opt any person to serve on the Executive Council for a special purpose. Such person's membership of the Executive Council shall, unless previously terminated by the Executive Council, terminate at the first ensuing convention; provided that he may again be co-opted. Such person may further be co-opted

kan ook by eenparige besluit van die Dagbestuur, waarvoor in klousule 16.4 voorsiening gemaak word, in daardie liggaam geko-opteer word vir so lank as wat die Dagbestuur besluit.

16 Pligte en bevoegdhede van die Uitvoerende Raad.

Die sake van die Vereniging word deur die Uitvoerende Raad ooreenkomstig hierdie Grondwet en die besluite van die konvensie of tegniese vergadering bestuur. Die Uitvoerende Raad voer die doelstellings van die Vereniging uit en oefen, benewens die bevoegdhede wat reeds hierin aan die Uitvoerende Raad toegewys is, ook die volgende bevoegdhede namens die Vereniging uit :—

16.1 om die gelde en ander eiendom van die Vereniging te ontvang, te administreer en aan te wend, om gelde wat nie onmiddellik deur die Vereniging benodig word nie, te belê en om sodanige beleggings te wysig of tot geld te maak. Die Uitvoerende Raad kan die Vereniging se gelde binne of buite Suid-Afrika bestee;

16.2 om enige kontrak namens die Vereniging te sluit en om enige regsgeding namens die Vereniging in te stel of te laat instel, te voer of te laat voer, te skik of te laat vaar, asook om enige regsgeding teen die Vereniging te verweer of te skik;

16.3 om die ondertekening van enige dokument namens die Vereniging te magtig: Met dien verstande dat alle dokumente waarby die geldsake van die Vereniging betrokke is, deur die Sekretaris/Tesourier en ten minste een lid van die Uitvoerende Raad, wat deur die Uitvoerende Raad daartoe gemagtig is, onderteken moet word;

16.4 om 'n dagbestuur aan te wys wat bestaan uit die President, die Aangewese President en hulle onderskeie raadsverteenwoordigers, en nog een ingenieurlid van die Uitvoerende Raad. Die dagbestuur is teenoor die Uitvoerende Raad aanspreeklik vir die administrasie van gedelegeerde en dringende sake van die Vereniging in die tydperke tussen vergaderings van die Uitvoerende Raad;

16.5 om ad hoc komitees uit die lede van die Uitvoerende Raad aan te stel en om hulle opdragte en bevoegdhede te bepaal;

16.6 om sy eie vergaderings en die vergaderings van sy komitees te reël;

16.7 om amptenare aan te stel en te ontslaan, mits die aanstelling in geen geval onderworpe is aan 'n langer diensopseggingstydperk as een jaar nie;

to the Standing Committee as provided for in clause 16.4 by unanimous decision of the Standing Committee and for such period as that body may determine.

16. Duties and powers of the Executive Council.

The affairs of the Association shall be managed by the Executive Council in terms of this Constitution and the decisions of the convention or technical meeting. The Executive Council shall carry out the objects of the Association and in particular shall exercise the following powers on behalf of the Association, such powers being in addition to the powers already hereinbefore assigned to the Executive Council :—

16.1 to receive, administer and apply the funds and other property of the Association, to invest funds not immediately required by the Association, and to vary or realise such investments. The Executive Council may expend the funds of the Association either within or without Souh Africa;

16.2 to enter into any contract on behalf of the Association and to institute, or cause to be instituted, conduct, or cause to be conducted, defend, or cause to be defended, settle or abandon any legal proceedings by or against the Association;

16.3 to authorise the signature of any document on behalf of the Association: Provided that all documents involving the finances of the Association shall be signed by the Secretary/Treasurer and by at least one member of the Executive Council authorised thereto by the Executive Council;

16.4 to appoint a Standing Committee consisting of the President, the President Elect and their respective council representatives and one other engineer member of the Executive Council, which committee shall be responsible to the Executive Council for the administration of delegated and urgent affairs of the Association between meetings of the Executive Council;

16.5 to appoint ad hoc committees of members of the Executive Council and to define their terms of reference and powers;

16.6 to regulate its meetings as well as those of its committees;

16.7 to appoint and dismiss officials, the appointment being in no case subject to a longer period of notice of termination than one year;

16.8 om reis- en verblyfkoste aan enige persoon te betaal, as dit nodig en in die belang van die Vereniging is.

17. Vergaderings en prosedure van die Uitvoerende Raad.

17.1 Die Uitvoerende Raad vergader so dikwels as wat die sake van die Vereniging dit vereis, maar daar word minstens een vergadering op 'n geleë tyd voor elke konvensie of tegniese vergadering gehou.

17.2 Agt lede vorm 'n kworum by 'n vergadering van die Uitvoerende Raad.

17.3 Die President tree by vergaderings van die Uitvoerende Raad as voorsitter op, of, in sy afwesigheid, die Aangewese President. As hulle albei afwesig is, kies die Uitvoerende Raad uit sy lede 'n voorsitter vir die vergadering.

18. Vergadering en prosedure van die Dagbestuur.

18.1 Die Dagbestuur vergader so dikwels as wat die Vereniging se sake dit vereis, dog minstens twee vergaderings word in die tydperk tussen konvensies en tegniese vergaderings gehou.

18.2 Drie lede waarvan ten minster een die President of die Aangewese President moet wees, vorm 'n kworum by vergaderings van die Dagbestuur.

18.3 By vergaderings van die Dagbestuur tree die President, of, in sy afwesigheid, die Aangewese President as voorsitter op.

18.4 Die notule van alle vergaderings van die Dagbestuur word binne ses weke aan alle lede van die Uitvoerende Raad gestuur.

19. Finansiële jaar van die Vereniging.

Die finansiële jaar van die Vereniging begin op 1 Maart van elke jaar.

20. Sekretaris/Tesourier.

20.1 Die Uitvoerende Raad stel 'n indiwidu of 'n regspersoon as Sekretaris/Tesourier aan, wat die hoofamptenaar van die Vereniging is.

20.2 Die Uitvoerende Raad bepaal die besoldiging van die Sekretaris/Tesourier, wie se pligte die volgende insluit :—

20.2.1 die byhou van 'n register van lede en geaffilieerdes van die Vereniging;

16.8 to pay travelling costs and subsistence allowances to any person where necessary in the interests of the Association.

17 Meetings and procedure of the Executive Council

17.1 The Executive Council shall meet as often as the business of the Association may require, but at least one meeting shall be held at a suitable time before each convention or technical meeting.

17.2 Eight members shall constitute a quorum at a meeting of the Executive Council.

17.3 The President, or, in his absence, the President Elect, shall preside at meetings of the Executive Council. In the absence of both the President and the President Elect, the Council shall elect a member as chairman for that meeting.

18. Meetings and procedure of the Standing Committee.

18.1 The Standing Committee shall meet as often as the business of the Association may require, but at least two meetings shall be held in the period between conventions and technical meetings.

18.2 Three members, of which at least one shall be the President or the President Elect, shall constitute a quorum at a meeting of the Standing Committee.

18.3 The President shall preside at meetings of the Standing Committee and in his absence the President Elect shall take the chair.

18.4 Minutes of all meetings of the Standing Committee shall be sent to all member of the Executive Council within six weeks.

19. Financial year of the Association.

The financial year of the Association shall commence on the 1st day of March of each year.

20. Secretary/Treasurer.

20.1 The Executive Council shall appoint as Secretary/Treasurer either an individual or a body corporate, who shall be the chief official of the Association.

20.2 The Executive Council shall determine the remuneration of the Secretary/Treasurer, whose duties shall include :—

20.2.1 the keeping of a register of members and affiliates of the Association;

20.2.2 die hou van die rekeninge van die Vereniging;

20.2.3 die redigering van die Vereniging se nuusbriewe;

20.2.4 die hoofkantoororganisasie van konvensies en tegniese vergaderings;

20.2.5 die sekretariële werk verbonde aan konvensies, tegniese vergaderings en vergaderings van die Uitvoerende Raad, die Dagbestuur en ander komitees van die Vereniging;

20.2.6 die voorlegging aan die konvensie van die verslag en balansstaat van die Vereniging;

20.2.7 die voorlegging aan die Uitvoerende Raad van 'n rekeningstaat ten opsigte van elke finansiële jaar;

20.2.8 enige ander pligte deur die Uitvoerende Raad bepaal.

21. Ereregsadviseur en ouditeur.

Die Uitvoerende Raad kan 'n ereregsadviseur vir die Vereniging aanstel, en stel 'n ouditeur aan.

22. Publisiteit.

Die President en die Sekretaris/Tesourier kan gesamentlik verklarings wat in die belang van die Vereniging of van ondernemings oor die algemeen is, aan die pers maak.

23. Takke.

23.1 Die Uitvoerende Raad kan goedkeuring verleen vir die stigting van 'n tak van die Vereniging mits die verteenwoordigers van ten minste vyf lidondernemings skriftelik daarom aansoek doen. In so 'n aansoek word die omstandighede uiteengesit wat die stigting van die voorgestelde tak wenslik maak en aangedui watter ondernemings binne die tak ressorteer. So 'n tak sluit die ondernemings in wat deur die Uitvoerende Raad goedgekeur word en geen onderneming word tot die tak toegevoeg sonder die goedkeuring van die Dagbestuur nie.

23.2 Elke tak kan sy eie grondwet en prosedurereëls opstel, maar 'n afskrif van die tak se grondwet en reëls moet by die Sekretaris/Tesourier ingedien word binne drie maande vanaf die datum van goedkeuring om die tak te vorm. Die tak se grondwet en prosedurereëls of enige wysiging daarvan, is aan die goedkeuring van die Dagbestuur onderworpe.

20.2.2 the keeping of the accounts of the Association;

20.2.3 the editing of the Association's newsletters;

20.2.4 the headquarters organisation of conventions and technical meetings;

20.2.5 the secretarial work connected with conventions, technical meetings and meetings of the Executive Council, the Standing Committee and other committees of the Association;

20.2.6 the presentation to the Convention of the report and balance sheet of the Association;

20.2.7 the presentation to the Executive Council of a statement of accounts in respect of each financial year;

20.2.8 any other duties determined by the Executive Council.

21. Honorary Legal Adviser and Auditor.

The Executive Council may appoint an honorary legal adviser to the Association and shall appoint an auditor.

22. Publicity.

The President and the Secretary/Treasurer may jointly make such statements to the Press as they may consider to be in the interests of the Association or of undertakings generally.

23. Branches.

23.1 The Executive Council may authorise the formation of branches of the Association on an application signed by the representatives of at least five member undertakings. Such application shall state the circumstances which make the formation of the proposed branch desirable and shall indicate which member undertakings should fall within the branch. Such undertakings shall constitute the branch as approved by the Executive Council, and no undertaking shall be added to the branch without the approval of the Standing Committee.

23.2 Each branch may draft its own constitution and rules of procedure but a copy of the branch constitution and rules shall be lodged with the Secretary/Treasurer within three months of the date on which authority to form such branch was granted. The branch constitution and rules of procedure, together with any amendments thereto, shall be subject to the approval of the Standing Committee.

23.3 Die notule van die vergaderings van takke word gereeld aan die Sekretaris/Tesourier gestuur en hy kan uittreksels uit die notule in enige dokument of publikasie deur die Vereniging uitgereik, insluit.

23.4 Geen tak kan die Vereniging kontraktueel bind voordat die skriftelike goedkeuring van die Dagbestuur verkry is nie.

23.5 Ongeag enige andersluidende bepalings van hierdie klousule is die kworum vir vergaderings van takke agt lede: Met dien verstande dat verteenwoordigers van ten minste vyf lidondernemings teenwoordig is.

24. Ontbinding van die Vereniging.

24.1 Die Vereniging kan ontbind word indien ten minste twee-derdes van diegene wat by die konvensie stemreg het, by wyse van 'n posstembrief ten gunste van sodanige ontbinding stem.

24.2 Geen voorstel vir die ontbinding van die Vereniging word oorweeg tensy alle lidondernemings ten minste drie maande voor die oorweging van die voorstel daarvan in kennis gestel is nie.

24.3 By ontbinding van die Vereniging bepaal die Uitvoerende Raad die voorwaardes van ontbinding asook hoe daar oor die bates van die Vereniging beskik sal word.

25. Wysiging van die Grondwet.

25.1 Hierdie Grondwet kan by besluit van die konvensie gewysig word nadat die Uitvoerende Raad aan die konvensie oor die voorgestelde wysiging verslag gedoen het.

25.2 'n Voorstel vir die wysiging van die Grondwet word in die agenda van die konvensie vervat. Tensy dit deur die Uitvoerende Raad voorgestel word, moet so 'n voorstel ingedien word óf deur 'n tak waarin dit met 'n meerderheid van twee-derdes van die ondernemings waaruit die tak bestaan, aanvaar is óf skriftelik deur minstens 20 ingenieurlede en/of raadsverteenwoordigers, en moet in alle gevalle ten minste drie maande voor die konvensie skriftelik aan die Sekretaris/Tesourier voorgelê word.

25.3 Enige voorstel ter wysiging van voorgestelde wysiginge van die Grondwet waarvan behoorlik aan die lede kennis gegee is, moet binne veertien dae vanaf die ontvangs van die voorgestelde wysiging skriftelik by die Sekretaris/Tesourier ingedien word.

26. Amptelike Tale.

Afrikaans en Engels is die amptelike tale van die Vereniging.

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23.3 The minutes of the meetings of branches shall regularly be sent to the Secretary/Treasurer, who may use any extracts from such minutes for publication in any document or publication issued by the Association.

23.4 No branch may bind the Association in any contract without the written approval of the Standing Committee first having been obtained.

23.5 Notwithstanding anything in this clause contained the quorum for branch meetings shall be eight; Provided that representatives of at least five member undertakings shall be present.

24. Dissolution of the Association.

24.1 The Association may be dissolved if at least two-thirds of those entitled to vote at a convention vote in favour of such dissolution by postal ballot.

24.2 No motion for the dissolution of the Association shall be considered unless all member undertakings were advised thereof at least three months prior to the consideration of the motion.

24.3 Upon dissolution of the Association, the Executive Council shall determine the terms and conditions of dissolution and the manner in which the assets of the Association shall be disposed of.

25. Amendment of Constitution.

25.1 This Constitution may be amended by a decision of a convention and after the Executive Council has reported to the convention on the proposed amendment.

25.2 A proposal for amendment of the Constitution must be contained in the agenda of the convention and, unless proposed by the Executive Council, shall be submitted through a branch in which it has been adopted by a two-thirds majority of the undertakings constituting the branch or over the signatures of not less than 20 engineer members and/or council representatives, and must in all cases be received in writing by the Secretary/Treasurer at least three months prior to the convention.

25.3 Any proposal for amendments to proposed amendments of the constitution of which notice has duly been given to members must be submitted to the Secretary/Treasurer in writing not more than 14 days after the receipt of the amendment.

26. Official Languages.

The official languages of the Association shall be Afrikaans and English.

OCTOBER, 1971.

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