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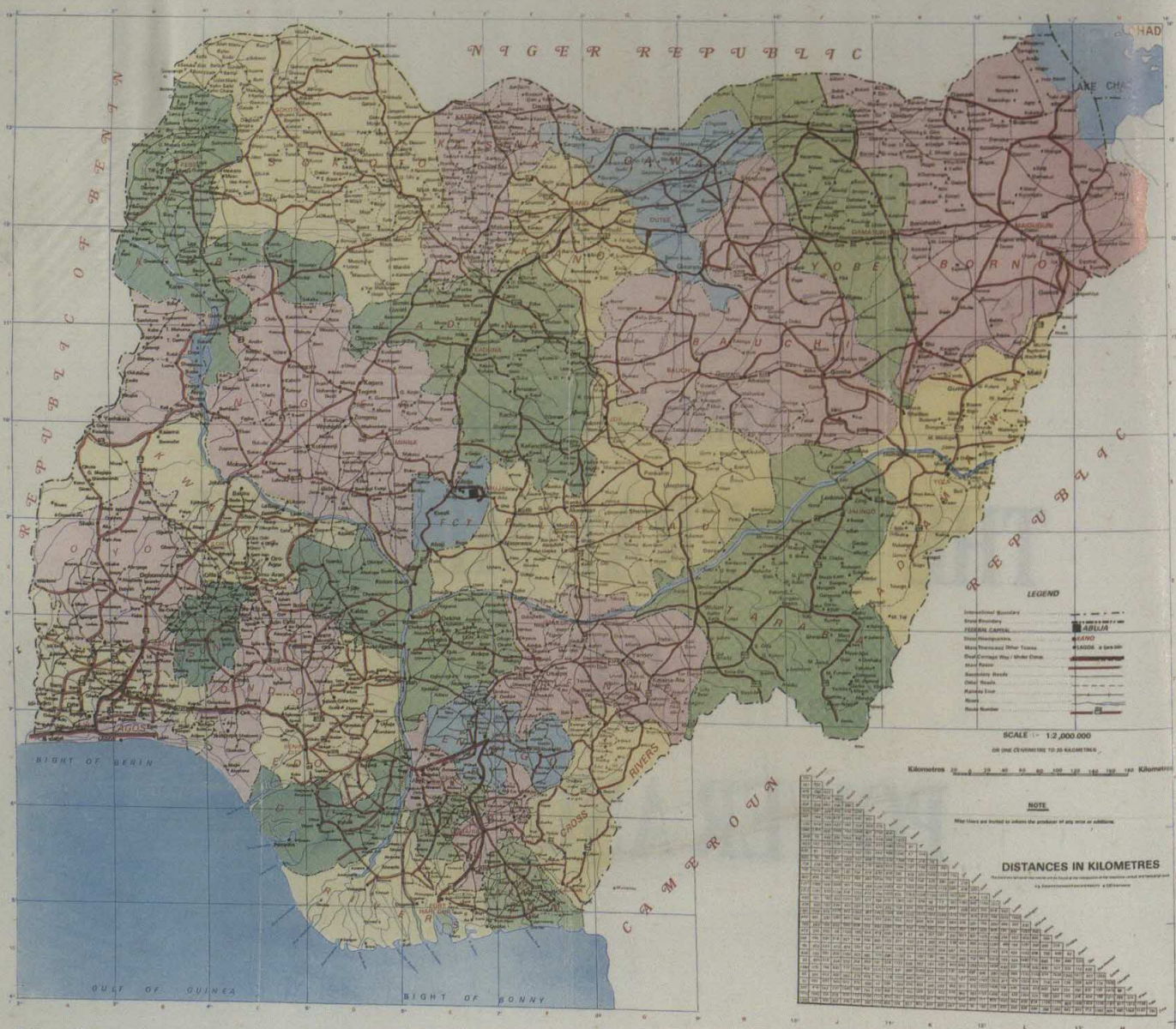
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Compendium of

# The Federal Ministry of Power and Steel

COMPENDIUM OF  
**THE FEDERAL MINISTRY**  
**OF**  
**POWER AND STEEL**



Map of Nigeria showing 30 States of the Federation and Abuja

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# COMPENDIUM OF THE FEDERAL MINISTRY OF POWER AND STEEL

Published for  
 Federal Ministry of Power & Steel

by  
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General Ibrahim Badamasi Babangida, CFR, FSS, mni  
President and Commander-in-  
Chief of the Armed Forces of the  
Federal Republic of Nigeria

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## Foreword

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Power and Steel are almost synonymous with modern civilisation. There is today no technological advancement without steel. In the same manner, any attempt at economic growth and development which emphasises the improvement of human welfare will come to nought without adequate supply of energy. Nigeria, even before independence, realised the importance of power and steel as the bedrock of any meaningful social transformation and industrial take-off. Hence, the first steel mills were set up in Nigeria around 1960. It is not therefore by accident that this administration decided to bring together these twin movers of industrialisation under the same umbrella: The Ministry of Power and Steel. In doing this, government was aware of the fact that Nigeria is richly endowed with the human and natural resources which, if well harnessed and exploited, are capable of placing Nigeria on the industrial map of the world. The Ministry was created in order to actualise this crucial national aspiration.

So far, the Ministry and parastatals under it have performed creditably well in transforming the national dreams into concrete achievements. Some units of the Ajaokuta Steel Complex were completed nearly a decade ago. Other steel mills are also operating at Oshogbo, Aladja, Jos and Katsina. National Electric Power Authority has successfully gone commercial in its efforts to satisfy the power needs, not only of Nigeria but also of some other African countries.

A book of this nature which highlights the poli-

## Foreword

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cies, achievements, challenges and programmes of the Ministry and its parastatals is, no doubt, an invaluable document for investors, researchers and the general public.

While commending the foresight of the authorities of the Ministry of Power and Steel for initiating such a book, I recommend it to the general public as a rich source of valuable information.

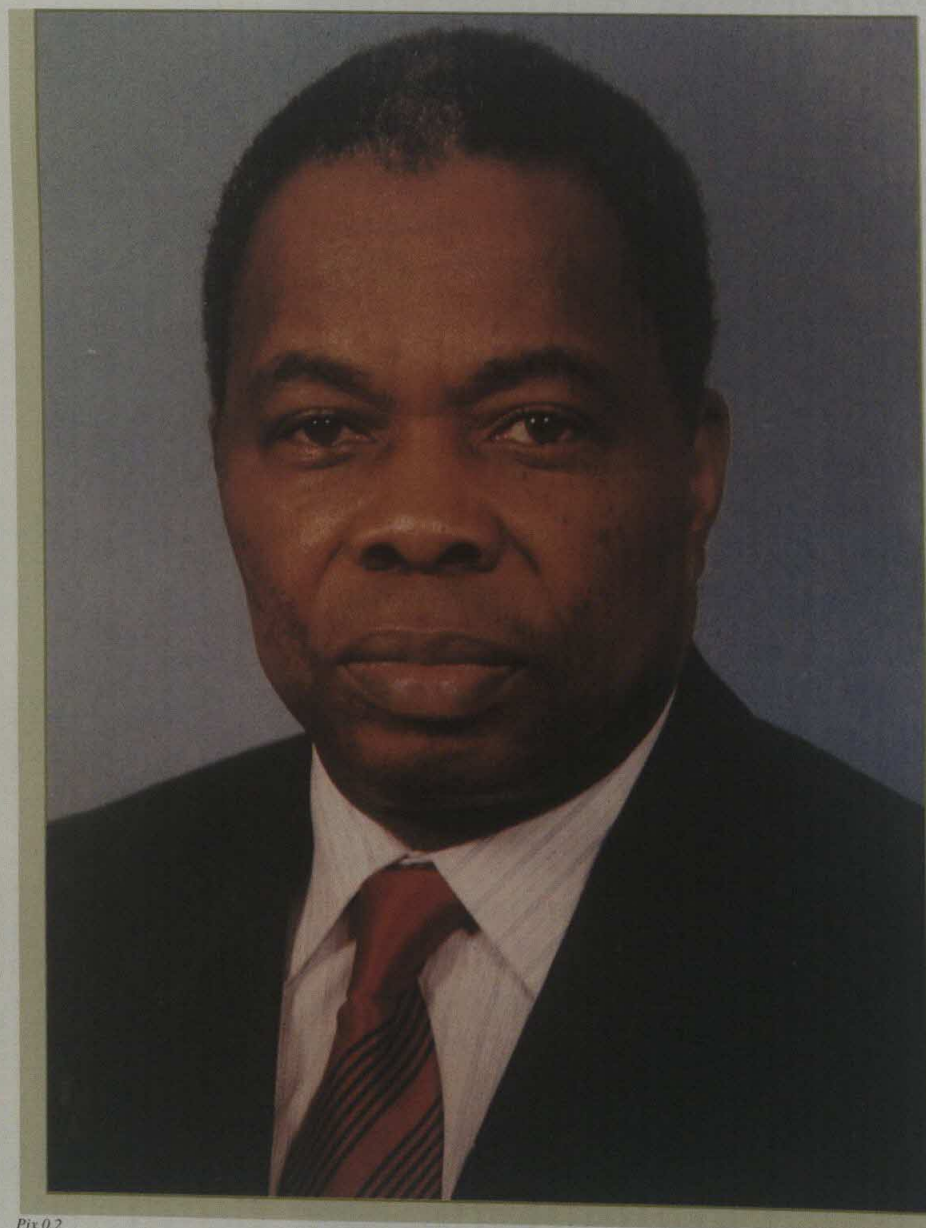
*General*

*Ibrahim Babangida*

*President*

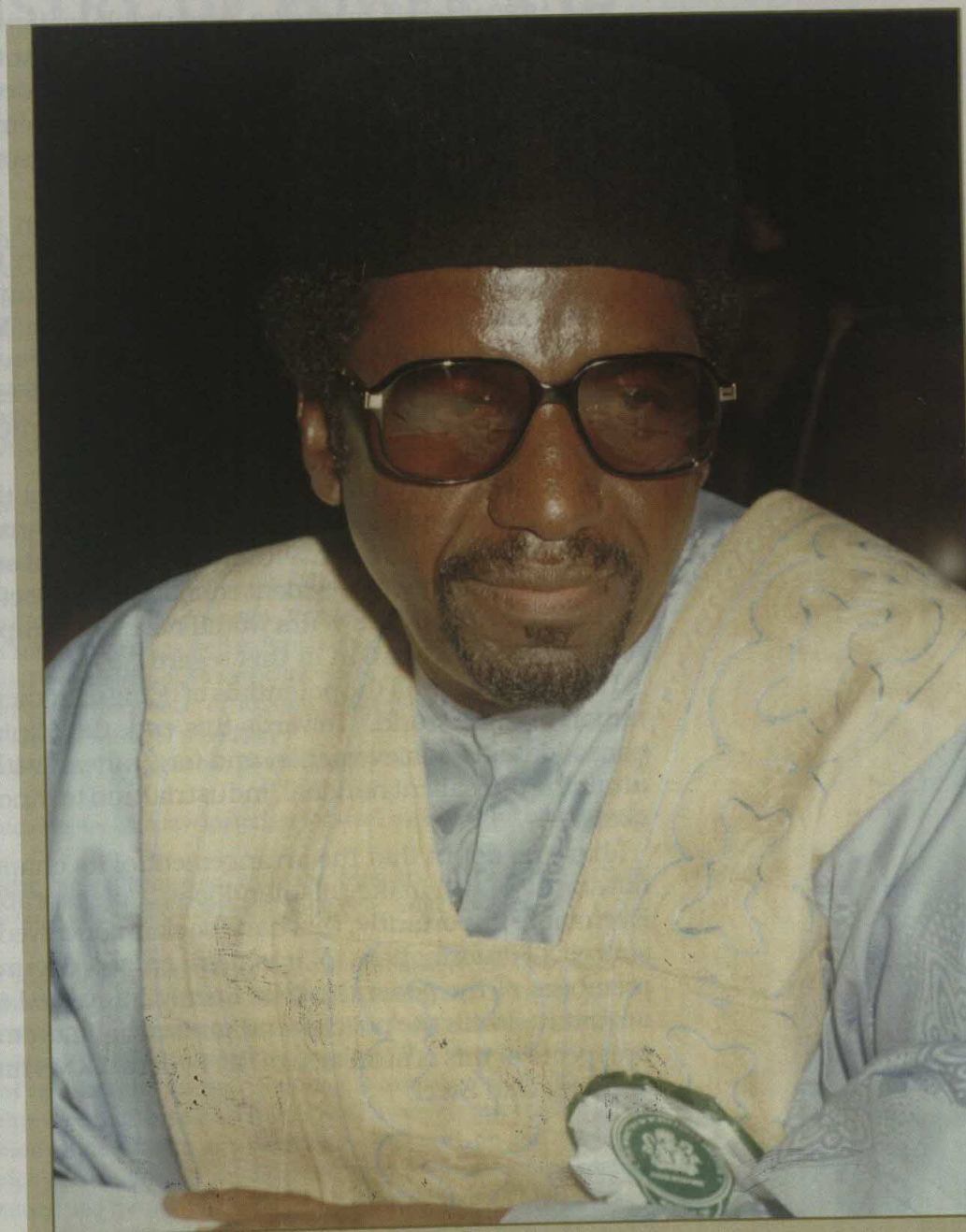
*Comd. In-Chief*

**General Ibrahim Badamasi Babangida**  
President and Commander-In-Chief  
of the Armed Forces of Nigeria



Admiral Augustus Aikhomu,  
Vice-President,  
Federal Republic of Nigeria

Pix 0.2



A.V.M. Nura Imam (rtd)  
Fss, Psc, Usawc,  
Minister of Power &  
Steel

Pix 0.3

## Preface

The 1980s clearly marked a remarkable watershed in the history of Nigeria's development. The nation's significant endeavours in the industrial and technological spheres received added driving force during the decade. Indeed, the era witnessed the systematic exploration and exploitation of the country's immense mineral resources to achieve well-articulated national goals.

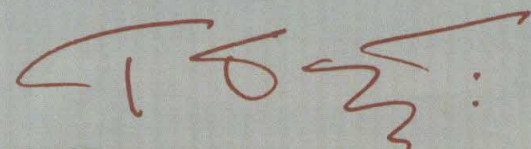
The inception of the present administration in 1985 saw the nation recording giant strides in her determined journey towards self-reliance in the strategic sectors of mining, power supply and steel development.

In the past seven years (1985-1992), the Federal Ministry of Power and Steel has been involved in the great national endeavours of transforming Nigeria into an industrial and technological success. This handbook is set out to chronicle and highlight these aspirations, achievements, challenges and prospects of this endeavour.

The Ministry's objectives are expected to reflect the aspirations of the Federal Government, which in turn, are in consonance with the desires and hopes of all Nigerians. Without the consistent support of the present administration, and the evident confidence of the citizenry, our achievements in the last seven years would have been impossible. We express our sincere appreciation in this regard.

The 1990s have all the potentials of being a momentous decade for our nation and the world. Towards this end, the Ministry will continue to consolidate its achievements, and forge ahead with renewed vigour in attaining our salient national, industrial and technological development goals.

I have no doubt that the arrangement of its chapters, and its simple, flowing style will make this handbook a pleasurable reading material. Even more importantly, this handbook is conceived to be an invaluable source of information to business entrepreneurs, researchers and members of the general public keenly interested in being adequately acquainted with the policies and projects, achievements, problems and prospects of this crucial arm of the Federal Government — the Ministry of Power and Steel.



**Air-Vice Marshal Nura Imam (Rtd.)**  
Honourable Minister  
Ministry of Power and Steel

## Chapter 1

# THE MINISTRY OF POWER AND STEEL

Within the last seven years (1985-1992), Nigeria has intensified its quest for accelerated industrial and technological development. Towards this end, appropriate policies and programmes have been enunciated by the Federal Government for systematic implementation by its various agencies.

Central to the attainment of this fundamental national goal of ensuring that Nigeria joins the mainstream of the dynamic technological age has been the Federal Ministry of Power and Steel. The Ministry has responsibility for three main areas of the national economy comprising Mining and Quarrying, Steel and Power sub-sectors.

### POLICY OBJECTIVES

In the implementation of its statutory functions, the Federal Ministry of Power and Steel maintains the following policy objectives:-

- (i) Ensuring optimum performance of members of staff;
- (ii) Greater diversification of the economy through intensive exploration and exploitation of solid minerals as well as formulation of a national policy on the conservation and stockpiling of strategic minerals;
- (iii) Ensuring optimum performance of existing steel plants so as to meet the domestic requirement for steel products;
- (iv) Provision of adequate and reliable power supply for both urban and rural population;
- (v) Research and development in raw materials for steel, as well as for other energy options;
- (vi) Pursuing further, in collaboration with the Ministry of External Affairs, bilateral relations with other countries in joint economic ventures.

The Ministry of Power and Steel has had a long and eventful history. At independence in 1960, it was called the Ministry of Mines and Power, with responsibility for the development of the nation's mineral resources including oil. A decade later, petroleum resources and steel development received tremendous boost by successive administrations leading to the formation of various agencies and parastatals to oversee their development.

Until the beginning of this year, the Ministry of Mines and Power was responsible for the exploration and exploitation of the nation's mineral resources — coal, tin and associated minerals, steel, and electricity generation. In the most recent governmental reorganisation, mineral resources was excised and transferred to the Ministry of Petroleum Resources. A new unit, Aluminium Smelter Company was added to the Ministry which now takes a new name — Ministry of Power and Steel.





AVM Nura Imam  
Minister of Power & Steel

Pix 1.1

Air Vice Marshal Nurudeen M. Imam was born in Kano City in 1945. He attended Rumfa College (1958 - 63). He enlisted into the Nigerian Air Force in 1964 as an Officer Cadet and received his basic training at NAF Tactical Training Wing at Kaduna. AVM N. Imam attended the German and Egyptian Airforce Technical Academies in 1965 and 1969, respectively. Between 1971 and 1972, he attended the US Air Force Aircraft Maintenance Officer's Course at Chanute, Illinois, USA. In 1973, he attended Maintenance Officer's Course of the Royal Air Force in the United Kingdom. Subsequently, he attended Air Frame and System Engineers courses with British Aerospace Company, UK; Rolls Royce, UK; Hawker Sidely, UK; Fokker VFF, Netherlands and Lockheed Aircraft Co., Georgia. He pursued an academic course at Troy State University, USA in 1983. Professional staff training received include the Command and Staff College, Jaji in 1979 and in 1984 was enrolled at the United States Air War College.

He was commissioned as Second Lieutenant in January, 1967 and promoted Captain and Commanding Officer SBS Enugu in 1969. He was a Major, and Engineering Control Officer in Lagos. As a Lt. Colonel in 1976, he was Commanding Officer, NAF Logistics Wing, Kaduna (1979 - 80). In 1979 he became the Director of Engineering, Nigerian Airforce Headquarters; in 1984, as an Air Commodore, he was the Officer in charge of the Logistics Command, Lagos, and a member of the Armed Forces Ruling Council, the highest law and policy-making body in the military government. He was promoted Air Vice Marshal in 1987. He was appointed Minister of Mines, Power and Steel in 1989 and reappointed in 1992 as Minister of Power and Steel after a governmental reorganisation.

In order to achieve the objectives outlined above, the Ministry is divided into six departments.

- (i) Personnel Management
- (ii) Planning, Research and Statistics
- (iii) Finance and Supplies
- (iv) Power
- (v) Electrical Inspectorate Services
- (vi) Mines Department (transferred to Ministry of Petroleum Resources in January, 1992).

The Ministry has under its aegis the following companies, parastatals and agencies:

- (i) National Electric Power Plc (NEP)
- (ii) Ajaokuta Steel Complex and Delta Steel Company
- (iii) The Steel Mills — Katsina, Jos and Oshogbo
- (iv) National Metallurgical Centres, Onitsha and Jos
- (v) National Steel Raw Materials Exploration Agency, Kaduna, and Aluminium Smelter Company of Nigeria Limited, Ikot Abasi, Akwa Ibom State.



Dr. T.P. Enodien  
Director-General, Power & Steel

Pix 1.2

Dr. Timyoniko Papaudo Enodien was born on July 23, 1934 at Eket, Akwa Ibom State. He attended Excelsior School, Calabar, Federal Training Centre, Lagos (1954 - 1958) and the University of London (1962 - 66) where he obtained a B.Sc in Economics. He has attended many seminars and Diploma courses both at home and abroad.

He began his civil service career in the Ministry of Defence and has served in various Ministries in the service, including Ministry of Agriculture, (Administration and Finance) where he was appointed Director of Budget in 1988. He was appointed Director-General in the Presidency in 1990 and later moved to Petroleum and Mineral Resources and the Ministry of Power and Steel.



Engr. H.A. Tukur  
former Director-General, Power & Steel.

Pix 1.3

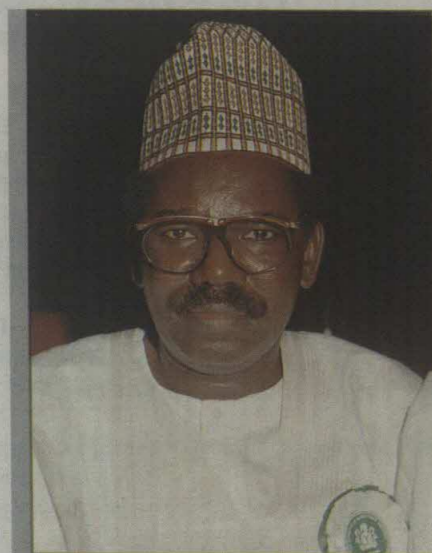
Engineer Hamman Adama Tukur was born in Jada, Adamawa State in January, 1942. He attended Government Secondary School, Yola and Ahmadu Bello University, Zaria, where he obtained B.Sc in Physics and a Masters in Electrical Engineering. He began his career as a Lecturer Grade I at the Kaduna Polytechnic in 1968, and rose to the post of Rector of the institution in 1977.

In 1985, he was appointed General Manager of the National Electric Power Authority (NEPA) and four years later was appointed the Director-General of the Ministry of Power and Steel. He was redeployed to the Ministry of Petroleum and Mineral Resources in 1992.

Alhaji Tukur has attended the National Institute of Policy and Strategic Studies in Kuru, Jos.



**Dr. W.I.A. Aderonpe**  
Special Assistant to the Hon. Minister  
(Technical)



**Engr. Magaji Inuwa**  
Special Assistant to the Hon. Minister



**Ms Inyingi Dappa**  
Press Secretary to the Hon. Minister of  
Power & Steel



**Mrs. U.E. Iheme**  
Legal Adviser

## PERSONNEL MANAGEMENT DEPARTMENT

The Personnel Management Department is a service department charged with the responsibilities for:

- (a) Establishment matters including Personnel Management and
- (b) Manpower development and staff welfare matters.

Before now, the general administrative service and all related functions of the Ministry were performed by the Finance and Administration Department. With the advent of the civil service reforms, the administrative functions were enlarged in scope and content with the inclusion of management concepts in respect of the day-to-day running of the Ministry, manpower development and training and general staff welfare. The Establishment Division of the department is divided into two sections viz:

- (i) recruitments, transfers and secondments;
- (ii) promotions and discipline.

With respect to the Management Services and Training Division, it is also divided into two sections viz:

- (i) manpower development and training, and
- (ii) management services and staff welfare.

In the department's efforts to meet the challenges of modern day management of staff, it has imbibed some of the finest elements of personnel management which subscribe to the values of appropriate training, placement and motivation of staff.

The Recruitments, Secondments/Transfers section is responsible for the appointment of officers, transfers and secondments of officers either from the Ministry to other arms of the government, or from other arms of the government to the Ministry. The Promotions and Discipline section is charged with the responsibilities for the promotion, guidance, counselling and discipline of serving officers. The Personnel Management Department serves as the Secretariat of the Personnel Management Board of the Ministry. Both sections perform these functions through the relevant Committees of the Personnel Management Board - Junior Staff Committee in the case of junior staff GL. 01 - 06, Senior Staff Committee in the case of senior staff from GL. 07 - 13 and Personnel Management Board in the case of officers on GL. 14 and above.

The Management Services and Training section is charged with the responsibilities for central administration and management in addition to manpower development and staff welfare in the context of the civil service reforms. The department liaises with the Federal Civil Service Commission, Establishment Department and other organisations on appropriate subject matter. With the introduction of the civil service reforms, these sections have assumed greater responsibilities and are covering wider scopes in the overall supervision and management of staff in the Ministry itself and, to some extent, in the parastatals and extra ministerial departments under the purview of this Ministry. This has resulted in an enhanced and better use of human resources in the conduct of government business. It has also resulted in a better articulation and implementation of the Ministry's training programmes aimed at the development of individual staff for purposes of achieving the corporate objectives of the Ministry and its parastatals and extra ministerial departments.

PAST MINISTERS OF THE MINISTRY



Alhaji A.T. Inuwa,  
Director, Personnel  
Management

Pix 1.8

As a service department, the Personnel Management Department offers support services to all other operations and service departments through the provision of general services like office and residential accommodation, office equipments, transport facilities and security arrangements etc. In addition, the department is responsible for stimulating and coordinating the activities of the Cooperative Thrift Society for the benefit of all categories of staff.

Table 1.1 shows the different Commissioners/Ministers who have headed the administration of this Ministry since 1955.

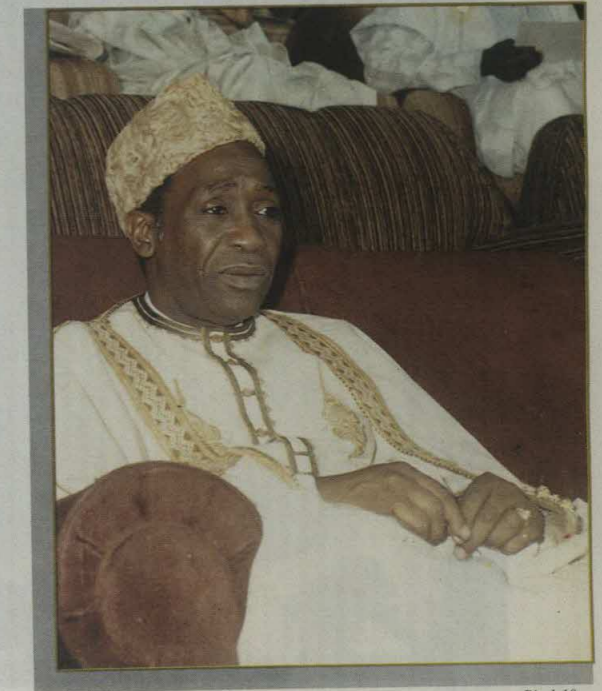
**Table 1.1**

Minister	Ministry	Period of Tenure
Alh. Muhammadu Ribadu	Min. of Mines & Power	1955-1960
Alh. Yussuf Maitama Sule	“ “ “	1961-1965
Dr. R.B.A. Dikko	“ “ “	1968-1971
Shettima Ali Monguno	“ “ “	1972-1975
Mr. Efiom Otu Ekong	“ “ “	1976
Alh. Kachala Barko	“ “ “	1977
Alh. Shehu Kangiwa	“ “ “	1978
Prof. Justin Tseyayo	“ “ “	1979
Alh. M. Ibrahim Hassan	“ “ “	1979
Mr. Paul Unongo	Min. of Steel Development	1980
Alh. Ali Makele	“ “ “	1981-1983
Alh. Idrisu Ibrahim	Min. of Mines & Power	1983
Mr. Audu Ogbe	Min. of Steel Development	1983
Alh. Rilwanu Lukman	Min. of Mines, Power & Steel	1984-1985
Prof. Tam David West	“ “ “ “	1985-1986
Engr. Bunu Sheriff Musa	“ “ “ “	1986-1988
A.V.M. Nura Imam (Rtd)	“ “ “ “	1988-1991
A.V.M. Nura Imam (Rtd)	Min. of Power & Steel	1992



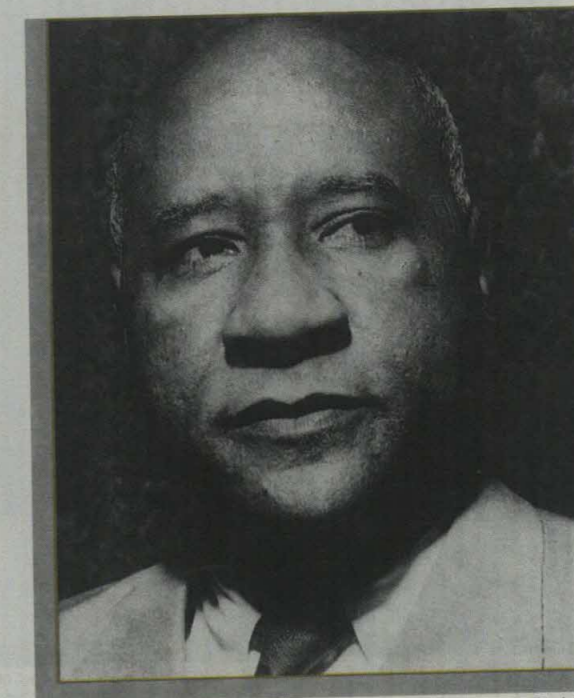
Alhaji M. Ribadu  
(1955-1960)

Pix 1.9



Alhaji Y.M. Sule  
(1961-1965)

Pix 1.10



Dr. R.B.A. Dikko  
(1968-1971)

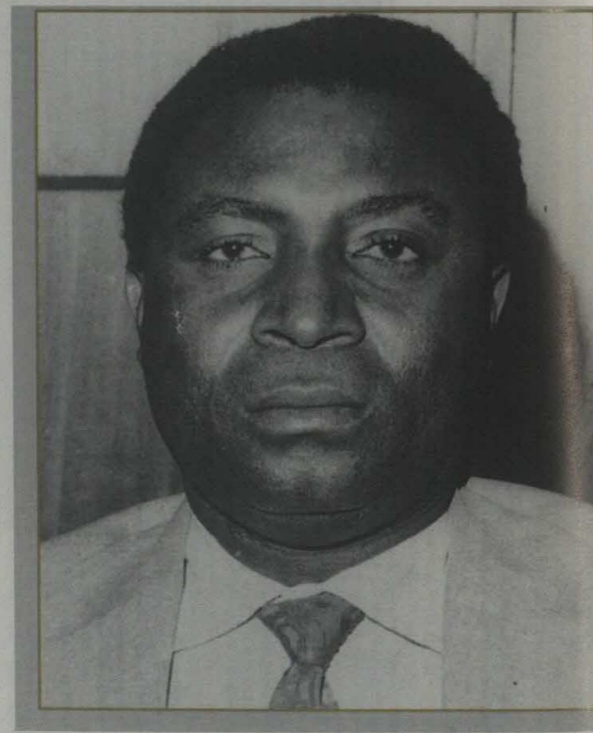
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PAST MINISTERS OF THE MINISTRY



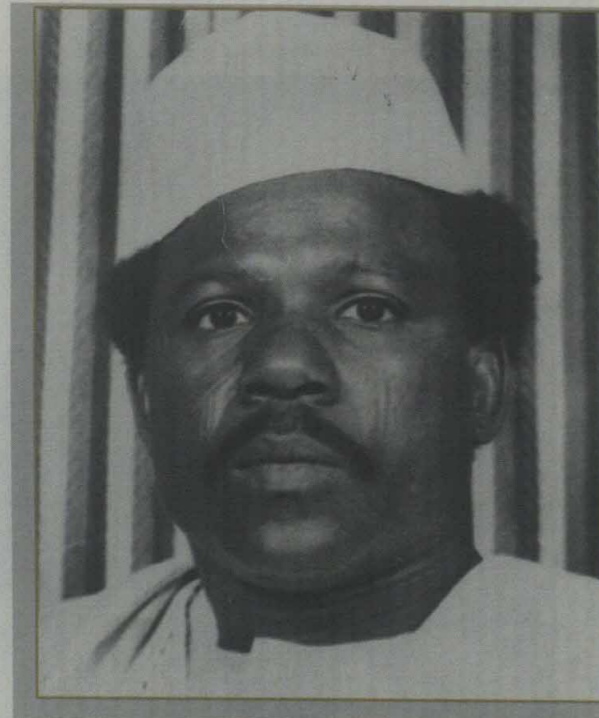
Alhaji Shettima Ali Monguno  
(1972-1975)

Pix 1.12



Mr. Efiom O. Ekong  
(1976)

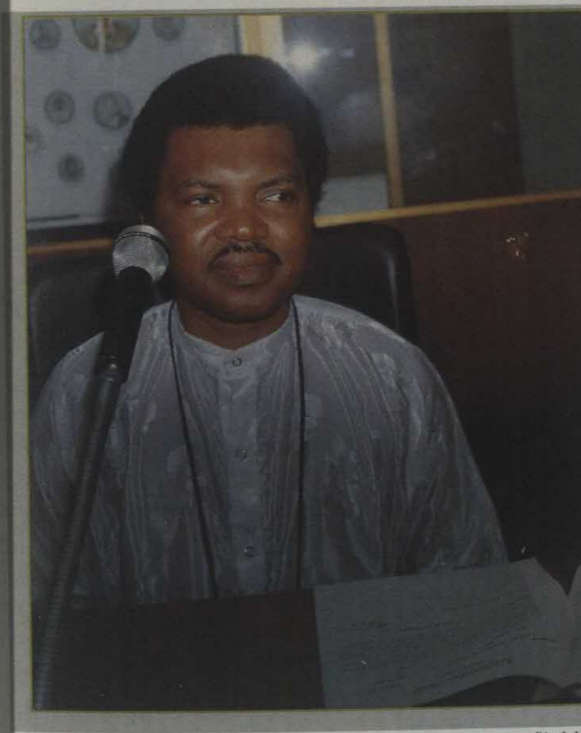
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Alhaji Ibrahim Hassan  
(1979)

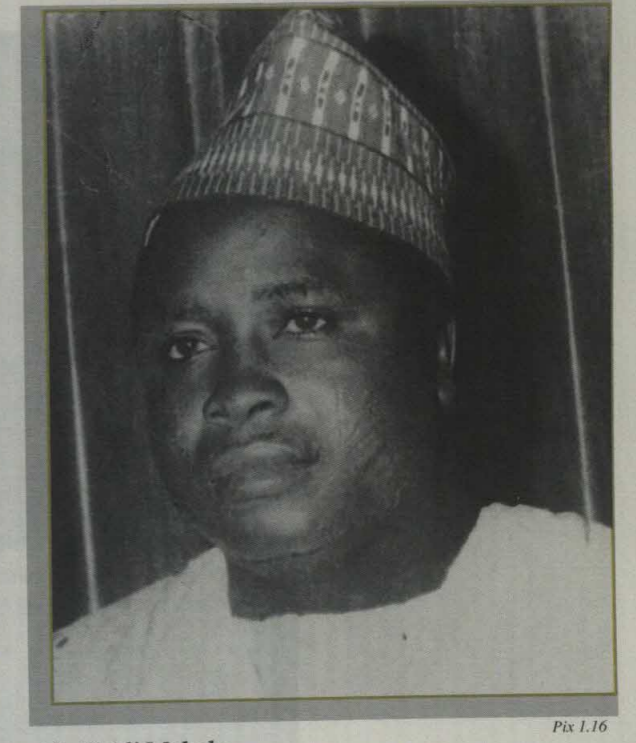
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PAST MINISTERS OF THE MINISTRY



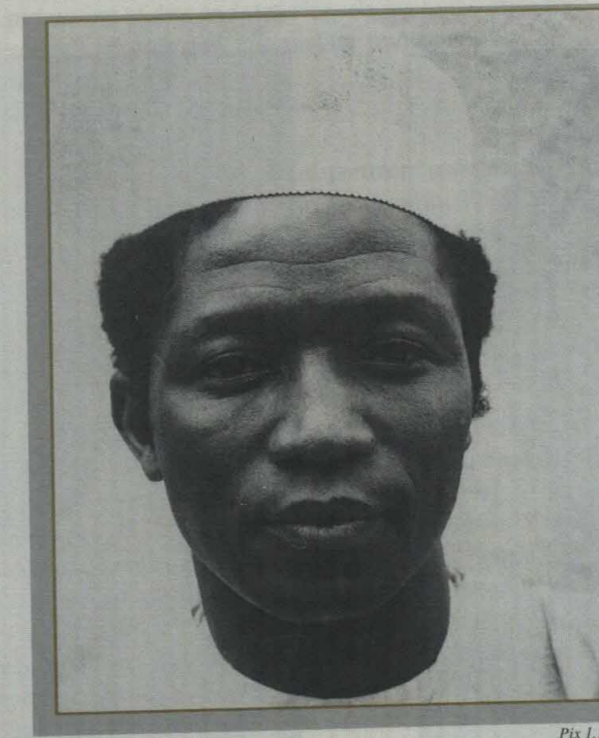
Mr. Paul Unongo  
(1980)

Pix 1.15



Alhaji Ali Makele  
(1981-1983)

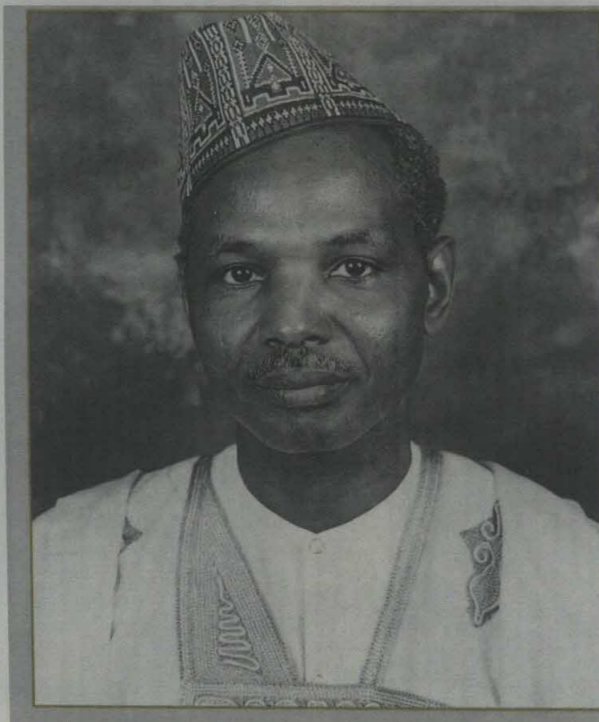
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Alhaji Idrisu Ibrahim  
(1983)

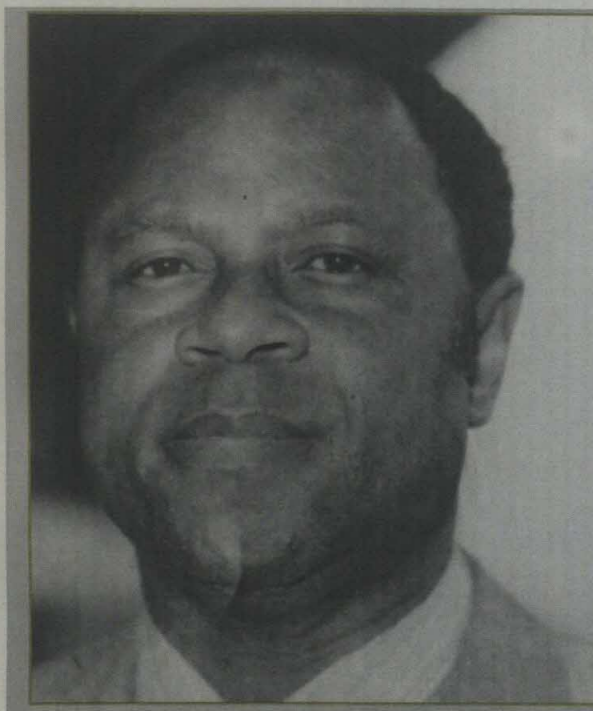
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PAST MINISTERS OF THE MINISTRY



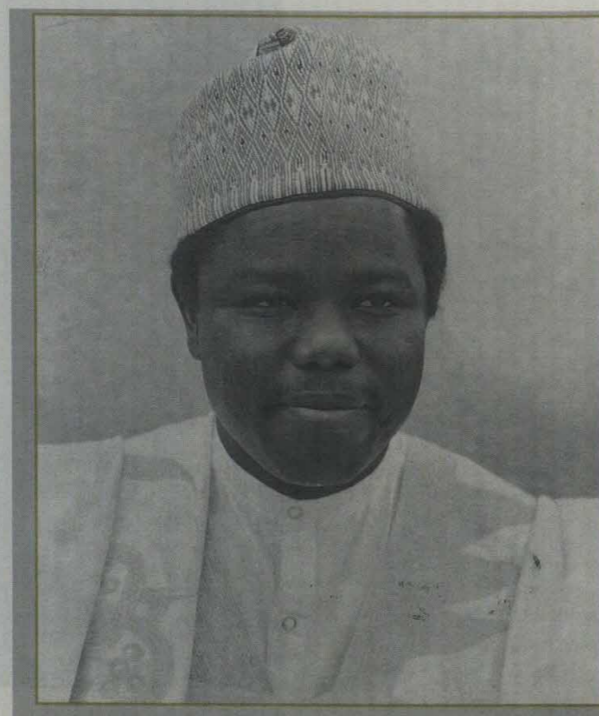
Alhaji Rilwanu Lukman  
(1984-1985)

Pix 1.18



Prof. Tam David West  
(1985-1986)

Pix 1.19



Engr. Bunu Sheriff Musa  
(1986-1988)

Pix 1.20

PLANNING, RESEARCH AND STATISTICS DEPARTMENT

The Department of Planning, Research and Statistics was established in early 1989 as a result of the provisions of the Civil Service Re-organisation Decree No. 43 of 1988. The Decree provides in its Section III, Sub-Section (9) that the organisational structure of each Ministry or Extra-Ministerial Department shall have three common departments including Planning, Research and Statistics Department. The others are the Department of Personnel Management and the Department of Finance and Supplies. As provided in Part III, Section 12, Sub-Section C of Volume I of the Explanatory Notes for Guidance on Important Elements of the Civil Service Reforms, the functions of the Department of Planning, Research and Statistics are as follow:

- (i) Development Plans (rolling, medium and perspective);
- (ii) Monitoring and evaluation of plan implementation;
- (iii) Secretariat of the tenders boards;
- (iv) Research into the sectors over which the Ministry has jurisdiction;
- (v) Research into the internal organisation and operational modalities of the Ministry;
- (vi) Sorting and monitoring of performance and efficiency targets for the various sub-divisions and staff of the Ministry;
- (vii) Constant collection and processing of data and statistics relating to the Ministry;
- (viii) Management of the Ministry's records and information resources (data bank, computer services, registry, library, etc);
- (ix) Liaison with relevant bodies outside the Ministry.

In carrying out its responsibility for development plans, the department successfully co-ordinated the development plans of the projects of the various departments and the 12 parastatals under the supervision of the Ministry for the 1990-1992 rolling plan. The plans highlighted the priority projects to be undertaken in the mines, power and steel sectors of the economy over the plan period. These rolling plans of the various bodies under the Ministry's supervision were scrutinized and classified before submission to the former Ministry of Budget and Planning.

The department has made encouraging efforts in its role for the monitoring and evaluation of plan implementation. From early 1989 to the end of 1991, the department sent out 15 teams to monitor and evaluate the development plans of the Ministry and its parastatals. In the mines sector, the establishments visited included the Nigerian Mining Corporation, Jos, Mines Department Office, Jos; Nigerian Steel Raw Materials Exploration Agency, Kaduna; Nigerian Coal Corporation, Enugu; and the Geological Survey Department Office at Kaduna. The steel sector companies monitored were Ajaokuta Steel Project, Delta Steel Company, Warri and the three inland steel rolling mills located at Jos, Oshogbo and Katsina. One of the monitoring teams also visited the Metallurgical Training Institute (MTI) at Onitsha. The projects in the power sector monitored included the Jebba Hydro-electric power station and the offices of the Electrical Inspectorate Services Department at Jos and Ilorin.

The department provides the "Secretariat" for the Ministerial Tenders Board (MTB) and the Departmental Tenders Board (DTB). It prepares and circulates papers for the meetings of the Tenders Boards, covers the meetings and drafts relevant minutes. It also conveys the decisions of the Tenders Boards to those concerned. Between December, 1989 and December 1991, the department handled 66 contracts for the Ministerial Tenders Board and three for the Departmental Tenders Board.



Mr. S.O. Dosumu,  
Director, Planning,  
Research and  
Statistics

Pix 1.21

In its research orientation, the department has started to conduct internal research on the activities of the Ministry, and sectoral research on the performance of external factors that have bearing on the Ministry's functions and performance. Statistical data are also being collected and processed on the Ministry's activities. To this end, a Computer Service Section has already been set-up. The first group of officers for the computer service has completed its initial training programme, while the second group is currently undergoing the course of training. A library has been set up, and it is being furnished with books, journals, magazines and other sectoral publications that are relevant to the functions of the Ministry.

In conformity with its responsibility for dealing with external bodies on bilateral and multi-lateral issues, the department has been attending meetings on bilateral and multilateral cooperation. The department has so far participated in Nigeria's bilateral talks in the country with 18 countries including the former USSR, Germany, Italy, Turkey, Czechoslovakia and Yugoslavia. The other countries include Japan, Peoples Republic of China, Trinidad and Tobago, Jamaica, Canada and some African countries, notably Ghana, Sierra Leone, Togo, Libya and Zimbabwe. The multi-lateral discussions for technical cooperation were held with the UNDP, the Commonwealth of Nations, the Commonwealth Development Corporation (CDC), and the World Bank.

The department is now taking the necessary measures to ensure that the established branches and sections are consolidated, while those that are not fully established are set up, staffed and equipped to enable each of them begin to play its roles in fulfilment of the aspirations of the civil service reforms.

## FINANCE AND SUPPLIES DEPARTMENT

The Finance and Supplies Department of the Ministry is made up of three divisions: Accounts, Budget and Supplies.

### ACCOUNTS DIVISION

The division operates the Ministry's accounts relating to the payment of salaries and other overhead expenses. These expenditures are made from the General Warrants and Development Fund Warrants received periodically from the Ministry of Budget and Planning.

Revenue collection is another function of the accounts division. As at November, 1990, for instance, the Federal Ministry of Mines, Power and Steel collected revenue to the tune of N8,027,823.47 for the 1990 financial year. This represented an increase of N2,688,267.15 over that of the preceding year (1989).

Furthermore, in keeping with stipulated financial procedures, the division regularly rendered monthly returns of revenue and expenditure to the Office of the Accountant-General of the Federation. It was also in this spirit of accountability that the Honourable Minister and the Director-General led the Ministry's team to the Public Accounts Committee, where the observations raised by the Auditor-General of the Federation against the Ministry's account were successfully defended.



Mr. A.T. Ikomi,  
Director, Finance  
and Supplies

Pix 1.22

### BUDGET AND SUPPLIES DIVISIONS

During the period under review, the budget division played its role of effective administration of the funds allocated to various projects of the Ministry and its parastatals. Moreover, in consultation with the other departments, it prepared and defended the Ministry's recurrent and capital budget proposals.

The budget division also ensured prompt quarterly disbursement of funds allocated to the departments and parastatals of the Ministry on receipt of the quarterly warrants.

On its part, the supplies division ensured that essential working materials were procured and made available as appropriate.

### MINES DEPARTMENT

(Now with the Ministry of Petroleum & Mineral Resources)

The Mines Department co-ordinates the Ministry's responsibility for the formulation and implementation of the policy to enforce all laws relating to prospecting, mining and quarrying of all solid minerals in the country. Furthermore, it is responsible for the control of commercial explosives, embracing its manufacture, importation, storage and utilisation.

Sequel to an intensive campaign embarked upon by the Ministry, appreciable response has been received from both public and private companies wishing to participate in the nation's mining industry. This positive trend has resulted in the remarkable increase in the issue of permits to purchase and process different brands of minerals, particularly gemstones.

In view of the enormous potential of the nation's solid minerals and the need to diversify the revenue base in order to revamp the economy, conscious efforts have been made to improve the revenue collecting machinery of the Ministry's Inspectorate Offices.

As a further means of enhancing the efficiency of the mines department, all zonal and area offices were abolished and replaced with divisional headquarters. The new structure has simplified the issuance of various types of mining leases and licences, as well as generally strengthening the field activities of the department.

The inspection machinery of the department has also been enhanced that cases of accidents involving mine workers on duty have been significantly minimised.

Table 1.2

#### NEW STRUCTURE OF THE MINES DEPARTMENT

##### MINES DEPARTMENT ZONAL GROUPING

S/NO.	ZONAL HEADQUARTERS	STATES
1.	Enugu	Anambra, Imo, Bendel
2.	Ibadan	Oyo, Ogun, Ondo and Lagos.
3.	Calabar	Cross River, Rivers and Akwa Ibom
4.	Makurdi	Benue, Kwara, Niger and Gongola.
5.	Jos	Plateau, Bauchi, Kano and Borno
6.	Kaduna	Kaduna, Katsina, Sokoto and Abuja.

The table above shows the mines department zoning structure which came into effect in 1990.

### Nigerian Coal Corporation

(Now with Ministry of Petroleum & Mineral Resources)

Coal is just one of the several minerals with which Nigeria is endowed. However, until very recently, coal ranked among the minerals that were being exploited in commercial quantities. This has been partly due to the very technical and high capital intensive nature of mining. Another significant factor was the illusion of limitless wealth created by the oil boom years, during which many strategic sectors of the nation's economy suffered neglect.

In the last five years, however, determined efforts have been made to revitalise the ailing coal industry by evolving new strategies. Significant progress has been made in this regard through the privatisation and commercialisation programme of the present administration. Again, the government has decided to invite private investors to set up joint venture companies on a profit and risk sharing basis. This strategy will ensure the availability of high-level technical assistance and maximum exploitation of our mineral resources for enhanced national development.

In pursuance of this strategy, the Federal Government has approved two joint ventures with Carbomin Limited of the United Kingdom and E.C. Ministry of Bulgaria which is in partnership with a Nigerian company, Bienventures Limited. The purpose is to increase coal production from Onyeama Mine in Enugu as well as Owukpa and Okaba mines in Benue State.

Onyeama Mine will be developed as a joint venture with Carbomin Ltd solely for export, while Owukpa and Okaba mines will be developed by E.C. Ministry and Bienventures Ltd for both export and local needs. When fully operational, the three mines will annually produce 500,000; 576,600 and 272,000 tonnes, respectively. At the moment, the Nigerian Coal Corporation is producing more coal than is required by its main local consumer, the Nigerian Cement Company Limited, Nkalagu.

Prof. Greg. Onyema Iwu, NCC, Enugu



Pix 1.23



Engr. D. B. Usman, Director, Mines

Pix 1.24

The Corporation is vigorously engaged in the exploration and exploitation of solid minerals other than coal and iron. Gold exploration, for example, has been carried out on both primary and alluvial sources in Oyo, Niger, Kwara and Sokoto states.

Evaluation of bentonite, a mineral substance used mainly in drilling mud in the oil industry, was done in Damboa area of Borno State yielding about three million tonnes, with prospects for industrial application. Work is in progress in the Fika and Gwoza areas in order to increase the reserves.

A survey of diatomite resources in Borno State has also indicated the presence of an initial 400,000 tonnes of the material which is used as a filler and insulation material. When processed, it is also used as filter aid in the beverage and sugar industries.

In the Abakaliki area, lead, zinc and brine evaluation is underway. The objective is to conclude a joint venture partnership with some private and foreign investors, with a view to commencing production in the mine within the next two or three years.

The exploitation of clay for brick-making has established clay-bricks as a suitable substitute for cement sand-crete blocks. The seven brick plants in Ikorodu, Enugu, Jos, Kano, Kaduna, Ibadan and Maiduguri are to be re-organised to sustain this marketing profile.

#### Uranium Development

(Now with Ministry of Petroleum & Mineral Resources)

The timely development of the country's uranium deposits is of strategic importance to the nation's technological and industrial development, defence needs as well as for alternative energy sources. The withdrawal of the French company from the joint venture between it and the Nigerian Uranium Mining Company (NUMCO) adversely affected the country's uranium project.

However, NUMCO has so far carried out extensive exploration work in parts of Adamawa and Borno States. Minimum mineable reserve is yet to be established from the point of view of the economics of this mineral commodity. What is not in doubt is that the strategic nature justifies increased national effort to attract the level of funding necessary for its activities in consonance with national objectives.

#### Privatisation and Commercialisation

Arising from the sub-committee report of the Technical Committee on Privatisation and Commercialisation (TCPC), investment of the Nigerian Mining Corporation in solid mineral end-use industries may be rationalised. Consequently, mineral production will be emphasised, while the private sector is encouraged to invest in the down-stream application of the produced minerals in industry.

#### National Metallurgical Development Centre, Jos

The centre was established to develop national capability by providing local inputs for the steel industry and to develop capability to effect repairs and maintenance of facilities, including servicing of industrial plants and processes. In its operations, the centre collaborates with the

United Nations Development Programme (UNDP) and the United Nations Development Organisation (UNIDO). The assistance of the United Nations agencies complements government's effort in providing equipment, machinery and manpower development for the centre.

The National Metallurgical Development Centre has achieved remarkable result in the local sourcing of industrial inputs in minerals like iron ore of various grades, refractory brick materials for thermal insulation in hot furnaces, base metals of lead and zinc used for metal pipes and corrosion protection of metal sheets.

These processes are available for commercialisation, but probably because such projects are capital intensive and are linked with risks, private entrepreneurs have not demonstrated appreciable patronage. Private companies are however being encouraged to pool resources, or establish co-operatives, so as to reduce the perceived risks in mining and mineral development ventures.

Beyond the direct involvement in the development of inputs and processes for the steel industry, the centre also provides consultancy services to industrialists in diverse areas like mineralogy, chemical analysis of raw materials, as well as mechanical testing of engineering materials.

#### National Iron Ore Mining Company Limited

The National Iron Ore Mining Company Limited came into being simultaneously with the nation's two integrated steel complexes and the three inland rolling mills. The primary function of the company is to explore, exploit and process iron ore for the iron and steel industry.

Re-organisation of the mining operations has improved the performance of the industry in the last two years. Through increased mining shifts and reactivation of the available mine machinery, the average iron ore monthly production is now 45,000 tonnes. With further financial assistance already provided by the Federal Government, production is expected to rise to between 130,000 and 170,000 tonnes per month. Such level of production will lead to the realization of the planned full capacity utilization of the processing plant.

#### GEOLOGICAL SURVEY DEPARTMENT

(Now with the Ministry of Petroleum & Mineral Resources)

The department has statutory responsibility for identifying the geology and mineral raw materials data base of the country in terms of occurrences and extent of mineral deposits. The surveys are conducted through geological, geophysical and geochemical methods.

#### Organisational Structure

The Geological Survey Department comprises three main functional divisions: Regional Mapping, Mineral Exploration and Support Services (including laboratory, cartography, publication etc.)

To ensure that its operational activities are evenly spread, the country is divided into six zones



Table 1.3

Explorable Minerals in Nigeria

MINERAL	USES	STATE/LOCATION	REMARKS
(a) Gold	Currency base, Ornaments	Osun, Niger	-
(b) Bentonite	Drilling mud in the oil industry, medicinal, cosmetic and pharmaceutical preparations	Abia, Borno	-
(c) Barytes	Filler in paint, rubber, plastics, weighing in drilling mud.	Plateau, Taraba, Benue	-
(d) Diatomite	As filter aids in the beverage and sugar industries, for heat and sound insulation, as abrasive in light-weight building materials and in ceramics	Borno, Yobe	-
(e) Lead, Zinc	Storage batteries, solder, pipes, ammunition, sheet lead, galvanising die castings, brass making	Enugu, Abia, Niger, Plateau, Kano, Bauchi, Taraba, Benue	Evaluation process ongoing with prospect for joint venture.
(f) Feldspar	In ceramics as glass material. In enamels, glass industry, tiles, sanitary wares	Borno, Kogi, Ogun	-
(g) Brick	Building industry	Lagos, Enugu, Plateau, Kano, Kaduna, Oyo, Borno.	-
(h) Tin	Tin plating, bronzed brass, solder, type metal, alloys etc.	Plateau, Kaduna, Kano, Bauchi.	-
(i) Calcium & Marble	In metallurgical industry, as flux. For producing lime.	Cross River, Anambra, Sokoto, Edo, Kwara.	Joint venture on-going

with Abeokuta, Owerri, Uyo, Yola, Kano and Kaduna serving as headquarters.

Raw Materials Sourcing

In pursuance of the Federal Government's policy of self-reliance, the Geological Survey Department considers local sourcing of raw materials for industries as one of its priority programmes. In this connection, the department has intensified exploration for minerals such as bauxite, phosphate, gemstone, gypsum, gold and several others.

(i) Bauxite

This is the raw material needed for the ongoing Aluminium Smelter Plant. Accordingly, its exploration has commenced vigorously. Already, about 30,000 square kilometres has been delineated for detailed survey in the

Table 1.3 Contd.

Explorable Minerals in Nigeria

MINERAL	USES	STATE/LOCATION	REMARKS
(j) Ceramic Clay	In ceramic industry	Plateau, Katsina, Bauchi	Joint venture ongoing
(k) Uranium	Alternative energy sources	Borno, Cross River	Exploration work in progress.
(l) Bauxite	Raw material for the ongoing Aluminium Smelter Plant	Adamawa	Investigation in progress
(m) Iron-Ore	Iron and Steel industry. In most modern industries associated with farming, building construction, manufacturing, industries.	Kwara, Kogi, Bauchi, Kano, Kaduna, Enugu	-
(n) Phosphate	For fertilizer	Sokoto, with minor occurrences in Abia, Ogun, Bauchi	-
(o) Gypsum	Manufacture of cement, Plaster of Paris and Boards.	Sokoto, Borno, Bauchi, Abia, Enugu, Edo.	-
(p) Gemstone	Jewellery and Ornaments	Katsina, Plateau, Kaduna, Bauchi, Kano, Kogi.	Discovery being investigated.
(q) Bitumen	Used for the production of asphalt, water-proofing, insulation, road construction and roofing.	Ondo, Ogun.	Report of feasibility study received.

Source: Mineral Deposits Data.

Adamawa highland and Mambila Plateau.

(ii) Phosphate

In the course of the department's exploration activities, it established the existence of phosphate (used for fertilizer) in Sokoto State. There are also minor occurrences in Imo, Ogun, Bauchi and Edo States.

(iii) Gemstone

Gemstone occurrence is being investigated in Plateau, Bauchi, Kaduna, Kano, Kogi, Bauchi and Edo states.

## (iv) Gypsum

Gypsum is one of the mineral raw materials used in the manufacture of cement. Substantial reserves of this have been proven in Sokoto State. Exploration efforts will, however, be sustained in other parts of the country where potential reserves are indicated.

## Seismological Monitoring Stations

Global climatic and geological changes have become more pronounced in recent years. Thus, no nation can afford to be complacent, particularly due to the unpredictable nature of the devastating effects which invariably accompany these changes.

It is in consideration of this fact that the Ministry of Mines, Power and Steel established and maintains six seismograph stations located at Calabar, Ibadan, Ilorin, Jos, Kaduna and Makurdi. They were installed in 1988.

There have been reports of earth tremors in some parts of the country, notably Calabar and its environs in Cross River State, Sokoto State and Ibadan in Oyo State. The magnitude of the tremor was estimated as three on the Richter scale. In the case of Sokoto, there was only evidence of ground settling caused by saturated strata at near surface level. The reported Calabar tremor was not monitored by any station nor confirmed.

However, the Ministry will continue to monitor earth tremor occurrences throughout the country, although theoretically, Nigeria is not known to be within the earthquake prone zone.

## Bitumen Development

(Responsibility of the Ministry of Petroleum & Mineral Resources)

In June 1989, the Federal Government inaugurated an Implementation Committee to ensure the commercial exploitation of the bitumen deposits in Ogun, Ondo and Edo states. The ultimate objective is to develop the reserve of tar sand deposit.

Also in 1989, the Ministry commissioned a Techno-Economic Feasibility Study on the project. The subsequent report revealed that tar sand occurred in two different horizons, a lower Horizon Y, separated from the overlying Horizon X by a variable thickness of oil shales. Both horizons show a total pay zone of 28 metres. The tar sand and heavy oil reserve is estimated to be about 40 billion barrels.

## National Steel Raw Materials Exploration Agency

The agency, based in Kaduna, is making significant progress in its search for local raw materials for the nation's iron and steel industry. Through various field studies, minerals such as talc, limestone, marble, fluorite, magnesite, graphite and chromite, identified as suitable for the iron and steel industry have been located to occur in Yobe, Adamawa, Taraba, Ondo,

Plateau, Sokoto, Niger, Oyo, Ogun and Borno states. Further preliminary studies are being conducted in parts of Benue State.

Government's policies of deregulation, privatisation and commercialisation should elicit the increased participation of the private sector in the strategic areas of the nation's economy. This will enhance the effective mobilisation and utilisation of scarce resources, in addition to the multiplier benefits derivable from joint ventures with foreign business partners.

Finally, the Federal Ministry of Mines, Power and Steel in collaboration with the Federal Government, will be unrelenting in making Nigeria a truly self-reliant, strong and great nation through accelerated technological and industrial transformation.

## POWER DEPARTMENT

This department of the Ministry co-ordinates the activities of the parastatals and agencies responsible for the generation and transmission of electric power throughout the country. The central body charged with the responsibility of performing this function is the National Electric Power Authority (NEPA).

## National Electric Power Authority

Power is a basic infrastructure. The presence or absence of electricity affects the quality and vibrancy of other sectors, and indeed the quality of individual life. Demand for steady and adequate supply of electricity has over the years been increasing at a rapid rate, especially for the ever growing large and small scale industries as well as domestic consumers in the country.

In recognition of the crucial importance of the electric power system, the present administration has accorded due priority to the sector. The commissioning of the 1320 megawatt Lagos Thermal Power Station, Egbin, in May, 1986, considerably improved the reliability of power supply in the country. Also in June 1990, the Federal Government reactivated and completed the previously abandoned 300 kilometres Escravos — Egbin gas pipeline project to facilitate the use of gas at the station.

Power supply received a further boost with the commissioning of the 600 megawatts Shiroro Hydro-electric Power Station. Shiroro is expected to supplement the aging Kainji Station, and add the much desired system reliability to the national grid.

## World Bank Loan And System Rehabilitation

In addition to direct investment in new power-stations, government has also intensified efforts in maintenance and rehabilitation of existing facilities. In this regard, plans for extensive rehabilitation work at Kainji and Jebba Hydro-Electric Power Stations under a World Bank loan agreement have been concluded. The Sapele, Afam and Delta Power Stations will also be rehabilitated under this programme.

**The objectives of the loan**

- (i) To assist NEPA in carrying out the needed maintenance and rehabilitation of selected generation, transmission and distribution facilities;
- (ii) To assist NEPA in carrying out institutional reforms needed to transform it into a commercially viable entity capable of providing its customers with a reliable and economic supply of electricity.

The value of the World Bank Loan is \$70 million (Seventy million US Dollars). In order to meet the set objectives, the World Bank advised that other loans/funds be made available to supplement theirs.

**Commercialisation of NEPA**

The Ministry, in collaboration with the Technical Committee on Privatisation and Commercialisation (TCPC), has made appreciable progress in line with the Federal Government's policy towards making some public sector parastatals viable and self-sustaining.

The Privatisation and Commercialisation Committee on NEPA submitted its report to the Chairman of the TCPC on Friday, August 31, 1990. Sequel to the Committee's report and recommendations, new chief executives have been appointed for better operational and organisational efficiency.

Other institutional arrangements aimed at improving NEPA include the working partnership with the British Electricity International (BEI). The co-operation arrangement is known as the Utility Partnership Programme.

**Rural Electrification Programme**

In its resolve to take development to Nigeria's rural areas, the present administration has revived the dormant Local Government Area Headquarters (LGHQ) Electrification Project. A task force was set up in 1987 to give impetus to the project which is now tagged LGHQ PHASE II Programme. Considering its multiplier effects, the programme has evidently improved the living standard of Nigerians, most of whom actually live in the rural areas.

The primary health care scheme, 6-3-3-4 system of education, modern agriculture and cottage industries in rural areas, all depend on the availability of electricity supply. To achieve the electrification of these towns and villages, the government secured credit line facilities worth \$117 million from Bulgaria and Germany for the supply of electrical equipment and materials.

**STEEL DEPARTMENT**

The Steel Department is responsible for the supervision of the activities of the Federal Government-owned steel companies. These companies include the two integrated steel complexes at Ajaokuta and Aladja, and the three inland rolling mills at Jos, Katsina and Oshogbo.

**Ajaokuta Steel Company**

The Ajaokuta Steel Company was established on September 18, 1979 and charged with the task of constructing and operating an integrated iron and steel plant at Ajaokuta. The steel city which comprises the steel plant and township is located on a sprawling 24,000 hectares of land on the west bank of the River Niger.

Considerable progress has been made in the first phase of the construction of the Ajaokuta Steel Plant. The planned facilities at the complex are now to be expanded to facilitate the production of flat sheet.

Several other production units have already been completed and commissioned. All the four rolling mills, captive power plant and the repair shop complex for manufacture of spare parts have been commissioned.

The Federal Government and the Ministry are closely monitoring activities at the steel complex in order to ensure proper and timely execution. In line with the commitment, these policy measures have been taken:—

- (i) The appointment of a seven-man Ministerial Task Force in 1990, to overhaul the management machinery of the steel company and ensure enhanced productivity. The task force has completed this assignment.
- (ii) Increased budgetary allocation for proper maintenance and operation of completed facilities.
- (iii) Improved welfare facilities for the staff to enhance morale, boost productivity and minimise high staff turn over.

**Available Facilities**

The available facilities now put into commercial operation include — Foundry, Forge and Fabrication Shop, Power Equipment Repair Shop and Captive Power Plant.

**(i) Foundry, Forge and Fabrication Shop**

Ajaokuta has the largest foundry, forge and fabrication shop in Nigeria. This gives it the capability for forging a large variety of components for local industries. Foundry components of about 20 tonnes capacity can be cast simultaneously.

Heavy industries like the cement manufacturing companies depend on the Ajaokuta Steel Company for the fabrication of complex and heavy spare parts.

**(ii) Power Equipment Repair Shop**

This shop is capable of the maintenance and repair of heavy duty electrical equipment such as switch gears, alternators, electric metres and transformers.

The Ajaokuta Steel Company, through aggressive market drive, has continued to receive orders for works worth N32.2 million from various Nigerian enterprises. These efforts will not only boost the company's revenue, but considerably conserve the nation's foreign exchange.

Local industries are therefore advised to avail themselves of the various facilities at the Ajaokuta Steel Company.

### Delta Steel Company

The Delta Steel Company was designed to produce and feed the three inland rolling mills at Jos, Katsina and Oshogbo with billets. Between 1985 and 1990, the company produced about one million tonnes of liquid steel for which it earned more than half a billion naira.

The Delta Steel Company reached its performance level in 1985 with over 24 per cent capacity utilisation rating, compared with 9.1 per cent in 1982. To further improve its production activities, Government provided a working capital grant of N70 million to the company.

Improvements in capacity utilization at the Delta project have stimulated increases in capacity utilisation in all the three inland rolling mills at Oshogbo, Jos and Katsina. In the first six months of 1990, for example, an increase of over 128 per cent was recorded over the same period of the previous year in the production of liquid steel. Similarly, impressive performances have been recorded in the production of billets and other rolled products in the past five years.

To sustain this positive momentum, the capital projects in the first three-year Rolling Plan (1991-1993) were aimed at achieving higher capacity utilisation level in specified areas like water cooled panels for EAP foundry mould expansion shop, cupola furnace plant and township infrastructure.

#### Growth And Development Strategies

In order to effectively promote sustained growth and viability for the industry, the Delta Steel Company has embarked on a systematic scientific drive towards utilising local materials as opposed to imported ones, through its Research and Development Unit. This policy has yielded some revenue-boosting sources for the company. These include the development of paint from lime; the processing of ladle turndish covering from local materials that include rice husks, slag and used bricks.

The company is, equally, currently engaged in an awareness campaign to encourage the private sector to establish downstream industries around the steel complex. Detailed feasibility reports have been compiled, published and launched. Projects which have been identified as being immediately available for private sector investments include:

- (i) Machine Shops
- (ii) Wire Drawing Plant
- (iii) Forge Shops
- (iv) Welding Electrodes
- (v) Pins and Clips Making Plant
- (vi) Slag Processing Plant

Also in consonance with the present administration's policy of diversifying the nation's export base from oil to non-oil exports, Delta Steel Company and the Ministry have explored the export potentials of the company's products. To facilitate this pursuit, it has been involved in market research and sales promotion drive, particularly regarding the exportation of gold briquetted and broken graphite electrodes. Significantly too, Direct Reduced Iron (DRI) has been exported to Britain and Spain, thereby earning the company some foreign exchange.

## THE THREE INLAND ROLLING MILLS

The three inland rolling mills at Katsina, Oshogbo and Jos were established to manufacture steel products such as iron rods, bars and wires, using steel billet from the Delta Steel Company. Each of the mills has a capacity for an output of 210,000 metric tonnes of rolled products per year.

The recorded increases in the capacity utilisation of Delta Steel Company positively affected the production levels of the three mills. However, the projects are beset with some constraints. Some of these problems are peculiar to some of the mills, while others are of a general nature. For example, all the rolling mills experienced a market glut as a result of substantial importation of steel products by major construction firms in the country.

The government and the Ministry continue to explore solutions to these identified constraints. In the case of the Jos Steel Rolling Mill for example, the government approved in the three-year rolling plan, the installation of a captive power plant. This facility will enable the company cope with power fluctuations during production.

Generally, the steel sub-sector performed impressively during the past five years, the operational constraints notwithstanding. In addition to enhanced production levels, relative industrial peace was recorded in the sub-sector.

### Strategic Perspectives

The period covered by this progress report (1985-1990) has indeed been momentous for the Federal Ministry of Mines, Power and Steel. Its crucial roles in the nation's endeavours for rapid economic, industrial and technological development have often faced tremendous challenges. Such challenges have, however, often strengthened the Ministry's resolve to succeed, with the support of the Federal Government, other agencies and institutions.

Modern nations are judged by the levels of their technological and industrial development. The Ministry is constantly guided by this cardinal philosophy in the planning and implementation of its various policies, programmes and projects.

The strategic perspectives of the Federal Ministry of Mines, Power and Steel are in close alignment with the vision of the present administration. It is irrevocably committed to taking Nigeria to the pinnacle of technological and industrial development.

Whatever constraints that have emerged in this historic journey so far, relate more to the vagaries and unpredictable dynamics of the international economic systems than the will to achieve as a nation. Impelled by unrealised revenue targets, for example, projects have had to be reviewed or re-scheduled.

## STEEL DEPARTMENT

### History And Development

The history of steel development in Nigeria dates back to the pre-independence era (i.e. before 1960). In 1958, initial efforts were made towards the establishment of a metallurgical



Engr. Tim. Efobi,  
Director, Steel

Pix 1.25

complex. At that time action was directed towards the establishment of mini mills that would substitute the limited quantity of imported steel materials which Nigeria was consuming then. As a first step towards this, extensive market surveys were carried out on steel demand and projections were made. It soon became clear that with the already known availability of iron ore in the Agbaja and Udi areas of the country, it would be more helpful to think in terms of an integrated steel plant.

Also, coal was available in the country and with the construction of the hydro-electric Kainji Dam, it was expected that electricity would be available in sufficient quantity. As a result of this, intensive studies aimed at determining the feasibility of an integrated steel plant were initiated. As these studies were pursued, various international bodies made proposals at various times. The proposals offered various technological processes both proven and unproven. However, the subsequent pilot tests that were carried out on the Agbaja and Udi iron ores later proved that they were unsuitable for the direct reduction process that was envisaged. Although small scrap-based, privately owned steel plants were established, it soon became obvious that the output of these plants could, in no way, cope with the growing demand for steel products in the country.

In 1967, a team of Soviet experts were invited to conduct a feasibility study for setting up an iron and steel plant in Nigeria. The Soviet experts presented a prefeasibility report which recommended the use of the blast furnace process for iron making. The report also pointed out that the known iron ore deposits in the country were of poor quality, and recommended that further geological surveys for exploration of better ores and coal for the proposed iron and steel industry should be carried out. This suggestion was carefully examined and it eventually led to the commissioning of Techno-export, an agency of the USSR Government, and the Geological Surveys of Nigeria. The agencies were jointly sponsored by the government of the then USSR and Nigeria to carry out aeromagnetic survey of over 22 per cent of the country in 1970. Ground magnetometric surveys and drilling for suitable types of iron ores and coal followed thereafter.

These investigations revealed that raw materials in reasonable quantity suitable for steel production abound in the country. These include iron ore deposits estimated at over 200 million

tonnes at Itakpe Hill near Okene, coking coal estimated at 120 million tonnes at Lafia in Plateau State, marble at Jakura and Ubo in Kwara State, limestone at Mfamosing in Cross River State, Dolomite at Burum and Osara, and refractory clays at Onibode/Oshiele etc. With these discoveries the basis for setting up a steel plant was established. To further emphasize government determination on the projects, the Nigerian Steel Development Authority (NSDA) was set up in April, 1971 by Decree No. 19, with responsibility for the establishment and the general development of the steel industry in the country as a whole.

In 1973, Messers Tiajpromexport of the USSR was commissioned to prepare a preliminary project report for the establishment of the first iron and steel plant in Nigeria. The report which was submitted in 1974 was rationalised and accepted in 1975. The Government specifically accepted the recommendation that the plant should utilise Itakpe Iron Ore and a blend of local and imported coals to produce long steel products only. Also in 1975, Government decided that Ajaokuta should be the site for the steel plant and the Ajaokuta Steel Project as it is now known, was born.

Another bold and giant step for steel development projects was taken in the 1975/80 development plan, when the government indicated its intention to set up two additional plants based on the direct reduction processes, that would take advantage of the vast resources of gas which at the time was mostly being flared away. Studies were intensified in this direction and a number of international group of companies were invited to send proposals based on a broad specification by NSDA. After careful consideration of these offers, the Midrex Direct Reduction process was selected, and a site was chosen at Ovwain, Aladja. This led to the establishment of the Delta Steel Company which was commissioned in January, 1982. The second proposed plant, which was to have been of the project technology process was shelved due to lack of funds, and the fact that the technology had not been proven as at that time.

Complementary to the setting up of the Delta Steel Plant, the government also decided on the establishment of rolling mills at three key market centres of the country. The three inland rolling mills located at Oshogbo, Jos and Katsina, with a production capacity for 210,000 tonnes of steel for each mill per annum were established and commissioned in December, 1982.

In order to enhance the supervision of the five steel plants, the National Steel Development Authority was abolished in October, 1979 when the Steel Development Department was created within the Executive Office of the President.

In January 1984, the Steel Development Department was reconstituted, and the Ministry of Mines, Power and Steel emerged.

The steel department which is one of the six departments of the present Ministry of Power and Steel is now charged with the responsibility for supervising and monitoring the activities of the Ajaokuta Steel Project, the Delta Steel Company, the three inland rolling mills and the Metallurgical Training Institute (Onitsha).

The Metallurgical Training Institute is a joint venture between the Federal Government of Nigeria and the Federal Republic of Germany. The Institute was founded in 1981 to cater for the training of middle level maintenance and repair personnel for the Metallurgical and Allied Industries in Nigeria.

Nigeria is a member of the African Iron and Steel Association (AISA), an agency established through the assistance of UNIDO.

One of the major achievements of the steel department during the last Constituent Assembly of AISA was her success in getting Nigeria elected to host the permanent headquarters of AISA. The Director of Steel, (Engr. Tim Efobi) was also elected the first president of AISA and

Nigeria was to present a candidate for the post of the first secretary general of the association.

## POWER DEPARTMENT

### History And Development of the Power Industry in Nigeria

Electricity was established in Nigeria in 1886 when two 30 kilowatt generating units were installed to serve the city of Lagos. Subsequently, the service was extended to other centres such that in 1951, when the then Electricity Corporation of Nigeria came into being, a total of 16 cities and communities were receiving electrical supply.

The Lagos City Undertaking was operated by the Public Works Department until 1946 and from 1946 to 1951 by the Nigerian Government Electrical Undertaking. Other undertakings were established and operated during this time by locally constituted supply authorities.

Under the Electricity Corporation of Nigeria Ordinance which took effect on April 1, 1951, the newly constituted Electricity Corporation of Nigeria assumed control and management of the 16 local undertakings then in existence.

Until 1962, each of the undertakings operated by the Corporation were isolated and received service from local sources of generation. In 1962, the Corporation constructed a 132 KV interconnection line from the Ijora power station in Lagos to the Ibadan power station in Ibadan. This interconnection was subsequently extended from Ibadan to Erinle and Akure. In addition, inter-connections were constructed between Benin and Ughelli in the then Midwest, between Oji and Afam in the East, and between Kaduna, Zaria and Kano in the North.

The first hydro-electric station in Nigeria was constructed by private tin mining interest in 1952 on a tributary of the Kaduna River at Kwali Falls, 27 kilometres east of Jos with an installed capacity of two megawatts. A second station of four megawatts capacity was constructed in 1929 by the Nigeria Electricity Supply Corporation Limited on a tributary of Benue River at Kurra Falls approximately 59 kilometres southwest of Jos.

The largest and first major hydro-electric station to be built in Nigeria formed part of the Kainji multi-purpose project commissioned in 1969 by the Niger Dams Authority. The hydro-electric features of the project included a power plant with an initial installed capacity of 320 megawatts which was later built up to 760 megawatts. In addition, the project comprised a high voltage transmission network operating at 330 KV from Kainji to Lagos in the West, Kaduna in the North, and eventually to Benin in the then Midwest and Aba in the East.

The facilities described above, together with the network facilities of the corporation with which they interconnected, effectively provided a single supply network for the greater part of Nigeria. Subsequently, various isolated undertakings were interconnected with the network and the system of the Nigerian Electricity Supply Corporation at Jos. In 1970, the Federal Government commissioned Shawmont (Canada) under a financing plan by the Canadian International Development Agency (CIDA) to study the power supply industry, analyse its problems and make recommendations on a possible merger of ECN and NDA as well as on improving management.

In 1971, Shawmont submitted a report recommending a new government authority with a decentralized organizational structure. The Federal Government Decree No. 24 of 1972 consequently created the National Electric Power Authority (NEPA).

The evergrowing demand for adequate and steady supply of power for adequate use as well as for the nation's industrial and economic growth makes NEPA the most sensitive parastatal in the country. Despite financial constraints occasioned by the present economic situation in the country, the government has since in August, 1985 continued to lay emphasis on the increase in the electricity generation capacity, construction of reliable transmission system, effective rehabilitation of the installed capacities as well as the development of skilled managerial and operational personnel. The results achieved during the period under review have been very tremendous.

In line with the above programmes, the Lagos Thermal Power Station at Egbin was completed and commissioned in May 1986 with an installed capacity of 1320 MW. Since the station relies on gas supply for operation, the government also completed the 300 kilometres gas pipeline project from Escravos to Egbin. The government also commissioned the 600 MW Shiroro Hydro-Power Station on May 20, 1990 while the Delta IV Thermal Power Station at Ughelli with an installed capacity of 600 MW was commissioned on March 12, 1991. In summary, with a total of 2520 MW additional capacities from these new generating stations, the present administration has contributed about 42 per cent of the total 6,098 MW installed capacity of NEPA. It is also significant that two of the three stations mentioned above were commissioned during the tenure of AVM Nura Imam as the Honourable Minister of Power and Steel.

As mentioned earlier, NEPA's total installed generating capacity is 6,098 MW contributed from its existing nine power stations. Six of these stations are thermal while three are hydro. The thermal stations are Afam, Oji, Delta, Ijora, Sapele and Egbin thermal power stations. The hydro-electric power stations are the Kainji, Jebba and Shiroro stations.

Despite the impressive record given above, other new projects are being planned for implementation in order to meet the nation's growing demand for power. In this connection, a contract for the construction of a 300 MW thermal power station at Geregu (near Ajaokuta) has been awarded, and the contractors are expected to mobilise as soon as funds are available. Similarly, a consultancy firm is currently carrying out engineering consultancy studies of the proposed Zungeru 950 MW hydro-electric project. This would be located about 60 kilometres downstream of the Shiroro hydro-electric power station on the same Kaduna River. Proposals for the construction and financing plans of the project would be considered as soon as the engineering studies are completed. Another proposal in the pipeline is the Mambilla hydro-electric project.

In addition to direct investment in new power stations, NEPA, in collaboration with the Ministry is intensifying efforts on the maintenance and rehabilitation of existing facilities. In this connection, the rehabilitation of Sapele, Afam and Delta Power stations are being carried out. Furthermore, funds are also being sourced for the maintenance of Jebba, Kainji and Egbin Power stations.

The objective of these rehabilitation exercises is to improve the generation capabilities of the affected stations thereby increasing the level of power supply to the nation. It is also to ensure that existing stations are not allowed to rot away just because new generating capacities are being planned.

The Ministry is conscious of the fact that no matter the level of total generating capability of the nation's power stations, adequate network of transmission and distribution facilities are required to boost the reliability and quality of power supply to consumers in various parts of the country. In this regard, a number of transmission and distribution projects were also embarked upon and completed within the past few years. There are other transmission projects already



Engr. J.K. Babatunde,  
Director, Power

Pix 1.26

approved for construction as soon as funds are available. The major ones are the 330 KV lines for Enugu - Makurdi, Gombe - Maiduguri, Alaoji-Enugu and the Benin - Onitsha lines.

One other area where improvement was made is in NEPA's revenue generation. It was realised that electricity tariff had become extremely low in comparison to the soaring cost of production. The rate per unit was far below unit cost of production. In realisation of this, a tariff review was effected from July 1989 on a graduated scale ranging from 6 kobo/kwh for low domestic consumers to 60 kobo/kwh for heavy industrial consumers. Although this has resulted in high revenue yield for NEPA since its introduction, it is still not sufficient to cover the operations of the Authority.

The Ministry in collaboration with the Technical Committee on Privatisation and Commercialisation (TCPC) made appreciable progress towards the commercialisation of NEPA. This is in consonance with the government policy of ensuring that most public sector parastatals are viable and self-sustaining. The TCPC Committee on NEPA submitted its report in August 1990, and immediately the restructuring of NEPA commenced. Before the close of 1990, a Managing Director was appointed to replace the erstwhile position of General Manager. Furthermore, four Executive Directors were appointed to head the four newly created departments namely, Finance and Administration, Generation and Transmission, Engineering and Distribution and Sales. The reorganisation exercise has virtually gone down the line.

#### Functions and Responsibilities of the Power Department

The Power Department is one of the departments under the Federal Ministry of Power and Steel. Basically, the department monitors the activities of the National Electric Power Authority on behalf of the Honourable Minister of Power and Steel with a view to ensuring that the objectives of the Federal Government in establishing the Authority are achieved. It therefore follows that the functions and responsibilities of the Power department are tailored after those of NEPA.

As mentioned earlier, the instrument setting up NEPA is Decree No. 24 of April 1, 1972. According to the Decree, the Authority is established "... to develop and maintain an efficient, co-ordinated and economical system of electricity supply for all parts of the Federation, or as the authority may direct..". The Decree also makes provisions for the appointments of Board of Directors, General Manager (now Managing Director) as well as other staff required for the efficient operations of the Authority. It also empowers the Board to pay officers and servants

of the Authority such remuneration and allowances as may be deemed fit subject to the approval of the Commissioner (now the Honourable Minister of Power and Steel).

In connection with the discharge of its duties as stipulated under the Decree, the authority has power to generate, transmit, transform, distribute, sell electricity either in bulk or to individual consumers in any part of Nigeria. It is also provided (in the Decree) that the rates or scales of charges for electricity shall be submitted by the Authority for the approval of the Commissioner (Hon. Minister) of Power and Steel. According to Section 16 (1) of the Decree, the Hon. Minister may after due consultation, give to the Authority such directions of a general character as appear to him to be requisite in the national interests and in particular, directions as to:

- (a) the expansion of existing electricity undertakings and ancillary works;
- (b) the establishment and working of new electricity undertaking;
- (c) the rendering of services and the supply of electricity to any government department; and
- (d) the creation and application of a general reserve notwithstanding that these directions may be of a specific character".

NEPA has several other responsibilities under the Decree such as the maintenance of proper accounts which must be audited at the end of every financial year of operations. The power department is therefore set up to assist the Honourable Minister in the effective monitoring and supervision of the operations of NEPA. It therefore performs the following duties:-

- (i) Generally, the power department ensures that NEPA operates in accordance with the provisions of Decree No. 24 of 1972 which established the Authority.
- (ii) It assists NEPA in obtaining necessary support and protection it requires from government to function effectively thereby removing all encumbrances that may impede performance.
- (iii) To ensure the implementation of existing energy policies as well as review obsolete ones and formulate new ones as national exigencies may demand for consideration by government from time to time.
- (iv) In line with (iii) above, to ensure adequate supply of stable power to meet growing national demands through the maintenance of existing capacities as well as the development of new ones.
- (v) To supervise and monitor the fixing of electricity pricing so as not to defeat government's objectives of guaranteeing industrial and social development through its provision.
- (vi) The department considers and processes NEPA's projects and contracts within the ranges of N2 million and N5 million to the Ministerial Tenders' Board for approval while those above N5 million are submitted to the Hon. Minister for the decision of the Finance and General Purposes Committee (FGPC).
- (vii) In order to keep NEPA's operation and project implementation costs as low as possible, the department assists the Authority in obtaining subsidies on such operational inputs as well as duty exemptions for imports such as plants and equipment for maintaining existing facilities and establishing new capacities.
- (viii) The department supervises NEPA in the preparations of annual budgets as well as the rolling plans.
- (ix) It also assists NEPA in securing budgetary allocations on quarterly basis as well as local and foreign loans for its operations. In the latter case, it assesses NEPA's financial

- requirements and liaises with relevant government agencies with a view to obtaining both local and foreign loans or technical assistance.
- (x) The department monitors the disbursement and utilisation of such loans as well as ensures that NEPA renders progress reports periodically for the consideration of the Ministry and government at large.
  - (xi) The department considers NEPA's annual audited accounts which it presents to the Honourable Minister for consideration by the Council of Ministers and thereafter, the Public Accounts Committee. This is to ensure that the Authority maintains adequate financial prudence in its operations.
  - (xii) The Power department also ensures that NEPA maintains a dynamic organisational structure. It therefore monitors staff welfare scheme, promotion, discipline, recruitment and training needs.
  - (xiii) To ensure power system maintenance, the department reviews daily summaries of power generation availability all over the country.
  - (xiv) It also investigates reported cases of electrical accidents so as to minimise or eliminate these incidences. Appropriate agencies of government are requested to assist in providing protection for NEPA facilities such as transmission towers.
  - (xv) Complaints received against NEPA from the public are also investigated to ensure fair play.
  - (xvi) Power department carries out critical reviews and appraisals of NEPA's briefs and memos on project contract awards.
  - (xvii) It carries out technical appraisal and scrutiny of NEPA's plans for long and medium-term power sector development and the strategy with which to achieve them and submit recommendations for the approval of such plans.
  - (xviii) Ensures that the Board of Directors of NEPA fulfils its statutory obligations effectively and that its activities are consistent with government policies on power and other matters.
  - (xix) The department also attends meetings particularly on power matters at both local and international fora. It provides leadership at international bilateral talks or negotiations on power matters particularly international agreement for either technical aid or loan negotiations for NEPA, or the supply of electricity to other countries.
  - (xx) It monitors and supervises the implementation of protocols on power matters between Nigeria and other countries and renders reports to government periodically.

**Conclusion**

There is no doubt from the accounts of the Power department and NEPA's activities given above that government is giving due consideration to the improvement in electricity supply to the nation. This is evident from the fact that both installed capacity as well as available capacity outstrip maximum energy demand. Even then, government, being fully aware that demand would continue to grow, has not relented in its efforts at expanding the nation's generating capacity through the planning of new projects as well as the rehabilitation of existing ones.

Table 1.4

**FEDERAL MINISTRY OF MINES, POWER AND STEEL  
MINERAL PRODUCTION IN METRIC TONNES  
1985 — 1990**

**FEDERAL PRODUCTION FIGURES**

MINERAL	1985	1986	1987	1988	1989	1990	TOTAL
Cassiterite	1,154.19	193.32	212.76	424.82	350.43	313.79	2,649.31
Kaolin	-	158.67	177.30	-	-	-	335
Limestone	4,770,732.79	1,847,376	2,627,409	1,598,954.30	1,802,639.90	1,135,692.20	13,782,804.19
Marble	3,950.10	14,820	68,968.50	5,445.26	1,386.85	1,605.99	96,176.00
Tantalite	-	-	-	-	-	32,080	224,929
Shale	233,560	104,386	88,230	-	-	60,112.84	354,232.66
Clay	147,389.82	97,618	49,112	-	-	0.23	245.23
Lead Zinc	39.17	119.77	86.06	-	-	44.31	302.78
Columbite	101.22	12.66	48.47	50.25	45.87	310.10	1,792.72
Refined Tine	1,084.23	90.85	307.54	-	-	77,501.11	585,876.79
Coal	139,743.72	144,411.36	110,160.86	33,086.73	80,973.01	-	-
Gold (GMS)	-	-	-	-	-	-	10.16
Quartz	10.16	-	-	-	-	-	-
Thorite	-	-	-	-	-	-	-
Zinc Ore	-	-	-	-	-	90,324	90,324
Iron Ore	-	-	-	-	-	-	-
Monazite	-	-	-	-	-	-	-
Wolfamite	-	-	-	-	-	-	-
Lead Ore	NA	-	-	-	-	-	-

Table 1.5

**PERMITS AND LICENCES ISSUED 1985 — 1991**

S/NO.	PERMIT/LICENCE	1985	1986	1987	1988	1989	1990	1991
1.	Quarrying Licences	500	508	512	520	568	594	600
2.	Entry Into Mining	6	16	40	44	53	24	42
3.	Quarrying Lease	65	68	72	75	80	82	86
4.	Mining Lease	10	20	25	15	18	10	5
5.	Permit to Import Explosives	10	10	11	12	13	16	17
6.	Form 'K' Licence	4	6	25	138	298	243	189
7.	Prospecting Right	73	66	115	126	126	47	65
8.	Blasting Certificate	-	-	76	24	50	34	25



Table 1.6

FEDERAL MINISTRY OF MINES, POWER AND STEEL  
REVENUE COLLECTED 1985 — 1990

S/No.	DETAILS	1985	1986	1987	1988	1989	1990
1.	Mining Fees	8,806.60	8,039	11,156.79	14,665.30	546,789.07	659,833.74
2.	Tallies for Tributes	-	-	-	40.50	20	-
3.	Penalties for Arrears of Rent	14,315.89	2,372	2,436.30	857.33	68.13	10,261.20
4.	Prospecting Right Fees	1,025.10	906	1,191.81	2,016,016	213,604.76	143,490
5.	Fees for QIs & Olcs	69,789.92	85,086.69	67,827.99	79,341.83	583,535.01	871,437.61
6.	Rent on Water Licences	682.72	148	39	51	90	90
7.	Rent on EPI	55	-	1,150	100	400	47,611.90
8.	Rent on Mining Right	100	41	-	213.50	-	-
9.	Rent on Mining Lease	21,619.68	20,163.20	16,932.75	1,511.65	-	446,440.93
10.	Rent on Quarrying Lease	1,509.46	1,363.18	506.87	1,690.20	104,549.13	50,318.10
11.	Royalty on Tin	1,676,578	152,109	1,812,056.26	1,092,836.34	1,044,333.30	442,813.69
12.	Royalty on Gold	-	-	-	-	-	-
13.	Royalty on Columbite	82,524.57	2,405.25	-	2,514.90	21,408.76	-
14.	Royalty on Tantalite	-	-	-	-	-	-
15.	Royalty on Wolfram	-	-	-	-	-	-
16.	Royalty on Silver	2,302	-	13,709.62	19,919.90	75	101,079.71
17.	Royalty on Zinc-Ore	-	11,186.50	-	-	-	-
18.	Royalty on Thorium	-	-	-	-	-	-
19.	Royalty on Iron Ore	-	-	-	-	-	-
20.	Royalty on Marble	5,356.20	6,035	12,246.53	21,047.77	7,123.85	10,085.60
21.	Royalty on Limestone	27,451	149,601.00	182,885.31	333,217.77	624,788.64	242,249.78
22.	Royalty on Varriable	1,211,690.32	144,324.57	1,578,196.73	1,722,139.70	2,874,950.00	5,062,425.7
23.	Oil Pipeline Licence Fee	-	-	-	-	-	-
24.	Other Fees	233.90	5,228.79	75,037.22	130,301.25	540,013.65	392,705.35
25.	Royalty on Gemstone	-	-	-	11,863.11	16,065.85	44,877.83
	Diamond & Gold Dealers Licences					750	17.750
	Total	3,124,066.36	1,887,961.85	3,775,373.18	3,434,336.33	6,582,537.70	8,590,205.50

ELECTRICAL INSPECTORATE SERVICES DEPARTMENT

History

The Electrical Inspectorate Division was established in the year 1954 by the defunct Federal Ministry of Lagos Affairs, Mines and Power.

Table 1.7

DIRECTORS WHO HAVE HEADED THE DEPARTMENT

1. D. M. Rait	-	1954 - 1963
2. W.A.L. Thomas	-	1963 - 1978
3. No Director	-	1978 - 1982
4. S. A. Adebari	-	August 1982-1990
5. J. K. Babatunde	-	1990 - 1991
6. H. Nggada	-	1991 to date.

FUNCTIONS AND OPERATIONS

The functions of the Electrical Inspectorate Services Department are spelt out in the Official Gazette No. 70 Vol. 57 of December, 1970 and No. 42 Vol. 73 of August, 1986 and as may be directed by the Honourable Minister.

Specifically, the Electrical Inspectorate Services Department carries out statutory functions of advising the Honourable Minister on all electricity and energy issues. The department is also responsible for the inspection, testing, certification and commissioning of all electric power transmission and distribution networks in the country. Other functions of the department include the licensing of privately owned generating sets whether used for standby purposes or sole sources of electricity, and the issuance of electrical wiring licence to competent and qualified electrical contractors.

In addition to the above highlighted functions of the department, it is also responsible for the investigation of electrical accidents and possibly conduct enquiries into their occurrences; investigate, and, if necessary, consider and pursue prosecutions for contravention of the Electricity Act, Chapter 57.

The department is also responsible for instituting and arranging for the implementation of new testing procedures of electrical equipment, materials and installations to ensure safety and reliability. Furthermore, the department is also responsible for ensuring standardisation of equipment and machines, accessories, and materials employed in generation, transmission and

distribution of power in Nigeria.

The department also on behalf of the Ministry and in liaison with the National Energy Commission participates actively in the formulation and implementation of the National Energy Policy for Nigeria.

The department also co-ordinates all Federal government sponsored rural electrification programmes. The rural electrification programme is being implemented by the Implementation Committee on Rural Electrification (ICRE) inaugurated by the Hon. Minister with membership of the Ministry, NEPA and the Secretariat from the Electrical Inspectorate Services Department, while the Director-General is the Chairman of the Committee.

In order to make its operations and functions effective, the department has since established area offices located at Abeokuta, Abuja, Akure, Benin-city, Enugu, Ibadan, Ilorin, Jos, Kaduna, Kano, Lagos (Shomolu), Maiduguri, Sokoto and Yola. The 15th Area Office is being opened at Port-Harcourt. Already, office accommodation has been secured and the area office will be fully functional soon. All the Area Offices are headed by area inspecting engineers.

The total staff strength of the department is 265 out of which 59 are engineering/technical staff. The remaining ones are in the common cadre (personnel, accounts, drivers, etc).

**Projects Under Execution**

There are two main projects being executed by the Electrical Inspectorate Department. These are:

- (i) Construction of National Electrical Equipment Test Laboratory (NEETL), Jos.
- (ii) Staff Housing/Office accommodation in state capitals.

**NEETL, JOS**

The purpose of the laboratory is to test and ensure that electrical equipment and electrically operated appliances meant primarily for general use are so designed and constructed that they do not cause danger either to their users or surroundings.

It will also ensure the equipment's performance and quality. By the establishment of the test laboratory, quality tests on all electrical equipment components and materials either assembled/manufactured locally or imported will be carried out to ascertain conformity with local and international regulations.

The physical construction of the main laboratory is yet to commence due to insufficient funding. The total fund requirement for the laboratory is now estimated at N500 million. For ease of execution therefore, the project is subdivided into three phases. Phase I which involves provision of infrastructure and test equipment for low voltage and household appliances is estimated to cost N20 million. The completion of this phase (Phase I) will enable the testing of low voltage electrical materials, equipment and household appliances manufactured and imported into the country thus, upholding standards and reducing risks of accidents in the use of electricity. Phases II and III involve the provision of infrastructure and installation of test equipment for medium and high voltage, respectively.

The consultancy work for the laboratory was awarded to ECEP (NIGERIA) Ltd. It has submitted drawings and documents which is being studied by the Federal Ministry of Works and Housing. The sum of N1.5 million was allocated for the project in 1992.

**Staff Housing/Office Accommodation**

In order for the department to realize the objectives of its functions as earlier highlighted, which entails complete coverage of the country, it is necessary to open offices in all the state capitals. At Ilorin, an office complex to house the electrical department is under construction at a total cost of N3.3 million. Work has reached 80 per cent completion on the project.

The sum of N1.0 million was allocated for the project in 1992.

**Rural Electrification**

The Federal Government's Rural Electrification Programme, otherwise tagged Local Government Headquarters (LGHQ) Phase II Programme which is a very laudable programme, is aimed at connecting all the Local Government Headquarters and some other large and important towns in the country to the national grid. This is with a view to enhancing the development of the rural areas. The programme was virtually dormant until 1985 when this administration initiated the inspections of the projects in all zones to audit the programme. As



Engr. H. Nggada,  
Director, Electrical  
Inspectorate Services

Pix 1.27

a result of the inspections, a Task Force was set up in 1987 to give impetus to the LGHQ rural electrification projects. So far, out of the present 589 local government headquarters, 396 have been electrified and connected to the national grid. While work is at various stages of completion in 49 others, the remaining are being surveyed.

**Off-Shore Materials**

All the major offshore electrical materials and equipment being used for the nationwide rural electrification scheme were secured through some credit facilities worth \$67m from the Peoples Republic of Bulgaria and the former German Democratic Republic, respectively. In respect of

the former, all the equipment and materials under this facility have been received while about 30 per cent of the materials ordered through the former GDR have been delivered. The delay in delivery of the balance of materials from Germany (former GDR) is due mainly to the process of unification of the former West and East Germany which resulted in M/S Elektro - Commerz GmbH (EC'G) being the legal successor of Elektrotechnik Export - Import, the former suppliers of the equipment to Nigeria.

The off-shore materials are being kept in various NEPA stores at Egbin, Ipaja, Iganmu and Ojo.

#### Rural Electrification Funds

We require about N150m to complete and commission ongoing projects. In addition, a sum of N200m is needed to prosecute the remaining 115 local government headquarters that are yet to be committed or awarded. About 30 rural electrification projects have been approved for execution, and the letters of intent had been issued on these projects while the necessary MTB memoranda are ready for tender. Meanwhile, the necessary survey and engineering designs for these towns/villages have been completed in anticipation of funds from the Federal Government. The cost of constructing the vital 132KV lines and associated substations to link up the local government headquarters (bulk supply) with the national grid is about N3bn. Possibilities of contractor financing through soft loan packages are being explored.

#### Katsina State LGHQ Projects

The contract for the electrification of some LGHQ towns in Katsina State was signed in December, 1990 with PCN Ltd. The loan agreement for financing the offshore contents of the contract amounting to DM 19,701,998.17 was also signed later between the Federal Ministry of Finance and Economic Development and AKA Commerzbank of Germany. The project was launched by Mr. President in December, 1991.

The onshore component of the loan amounting to N16,683,347.68 (1989 prices, about N30m 1992 estimates) is to be financed by NEPA while the Katsina State Government contributed a sum of N18m to cover the 15 per cent (of the offshore cost) downpayment i.e. DM 2,955,299.70. This amount has already been remitted.

## Chapter 2

# NATIONAL ELECTRIC POWER AUTHORITY (NEPA)

## HISTORY

Electricity power generation and supply in Nigeria dates back to 1886 when two 30KW generating sets were installed to serve the city of Lagos. Isolated power undertakings including those of the Public Works Department (PWD), Native Authorities, etc. also participated in the provision of electricity power in various towns thereafter.

On April 1, 1951, an Act of Parliament amalgamated these isolated power undertakings already supplying power to 16 communities into the Electricity Corporation of Nigeria (ECN). The ECN continued thereafter to provide electricity power alongside with other private undertakings. In 1952, a private tin mining firm constructed the first hydroelectric power station in Nigeria on the tributary of the Kaduna River at the Kwali Falls with installed capacity of 2 MW. A second similar station of 4MW capacity was constructed in 1959 by the Nigerian Electric Supply Corporation Limited (NESCO) on a tributary of the Benue River at Kura Falls.

After independence in 1960, the ECN took major steps to develop the electricity industry in Nigeria. In 1962, it constructed a 132KV interconnection line from Ijora power station in Lagos



Engr. Hamzat Ibrahim  
Managing Director/Chief Executive, NEPA

Pix 2.1

Engineer Hamzat Ibrahim was born on February 1, 1945. He attended Kaduna Polytechnic, 1959 to 1963, and Watford College of Technology, United Kingdom, 1964 to 1968.

He joined the Electricity Corporation of Nigeria (ECN) in 1963 and worked in various capacities with the National Electric Power Authority between 1973 and 1990. He was District Engineer, Kano, 1973-75, District Manager Grade II, Maiduguri, 1975-79; District Manager Grade I, 1979-82 and Director of Distribution, North-West zone, 1982-85, Assistant General Manager, NEPA Headquarters (1985-89), and Deputy Managing Director (Distribution and Sales) 1989-90. He was appointed the Authority's Managing Director in 1990. Engr. Ibrahim is a Chartered Engineer and winner of the Nigerian Society of Engineers Merit Award in 1990.

to the Ibadan power station and later extended this to Akure. Later, interconnection lines were constructed between Oji and Afam in the Eastern Region; Benin and Ughelli in the Midwestern Region and Kaduna, Zaria and Kano in the Northern Region.

Also in 1962, a major step was taken to develop the hydro-electric power system. The Niger Dams Authority (NDA) was established in 1962 for the development of the Kainji Hydro-electric project and the associated 330KV transmission lines and substations. The first major 330KV line constructed by the NDA was the Kainji-Jebba-Oshogbo-Lagos line. By 1972, the Kainji Hydro-electric power station already had an installed capacity of 320MW.

In that year too, the National Electric Power Authority (NEPA) was established by Decree No. 24 of June, 1972 and merged with the NDA and ECN with the primary responsibility to generate, transmit, distribute and sell electricity throughout the Federal Republic of Nigeria. NEPA was also mandated to "maintain an efficient, co-ordinated and economic system of electricity supply of all parts of the Federation."

The establishment of NEPA has not only provided for the operation of an integrated transmission grid but much more importantly, has proven to be the catalyst for the consolidation of industrial and socio-economic development activities nationwide. The rate at which electricity power generation and supply has grown between 1972 and 1992 is a testimony to the determination of the organisation to attain the lofty objectives for which it was set up.

### GENERATION OF ELECTRICITY

In the days of ECN, there were about 30 isolated power stations which were generating and distributing electricity nationwide.

The sharp rise in the demand for electricity following the industrial boom of the late 1960s and 1970s made it imperative for the National Electric Power Authority to formulate policies

Delta IV Power Station (820 mw) Ughelli, Delta State



Pix 2.2

that would aggressively address the prevailing situation.

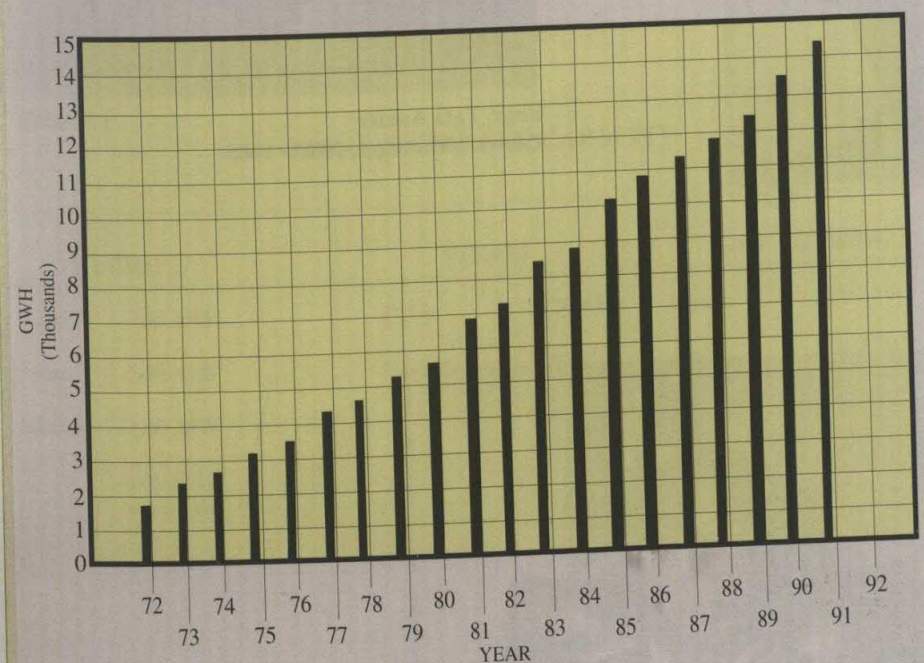
The outcome of the deliberation was the policy to generate, transmit and distribute electricity on a large scale to meet the ever rising demand of the consumers nationwide.

One fact that is decipherable and acceptable at this point is that over the years, there had been a steady rise in the generation of electricity to match the rise in demand.

Indeed, the generating capacity of electricity which on inception was a mere 30 kilowatts rose sharply to 30 megawatts in 1960.

Between 1961 and 1990, the power generating capacity of the Authority had reached an all time high point of over 3,000MW. The good point is that, further progressive improvement in

**TOTAL ENERGY GENERATED GWH 1972 - 1991**



Graph 2.1

Source: Engr. H. Ibrahim; Electricity Industry in Nigeria and National Development

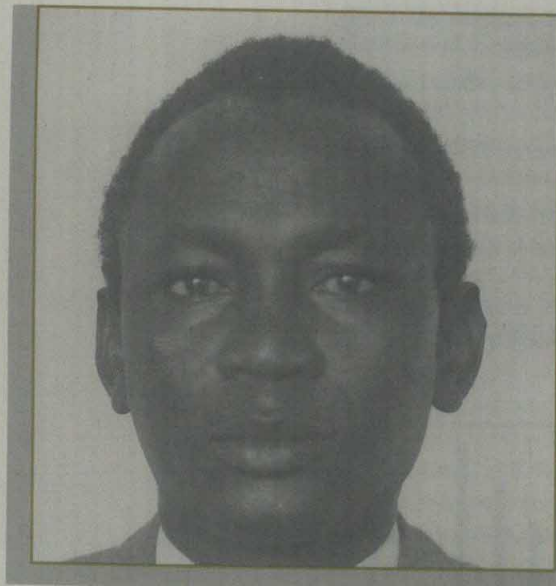
the generating capacity for electricity by the Authority continued to be recorded with the 6,098MW that was reached early in 1991.

Obviously, this total generating installed capacity of 6,098MW of electricity is far in excess of the average demand figure of about 3000MW.

At present, the Authority generates its electricity through thermal and hydro processes. Also, NEPA owns and manages nine generating power stations strategically located at various places in the country.

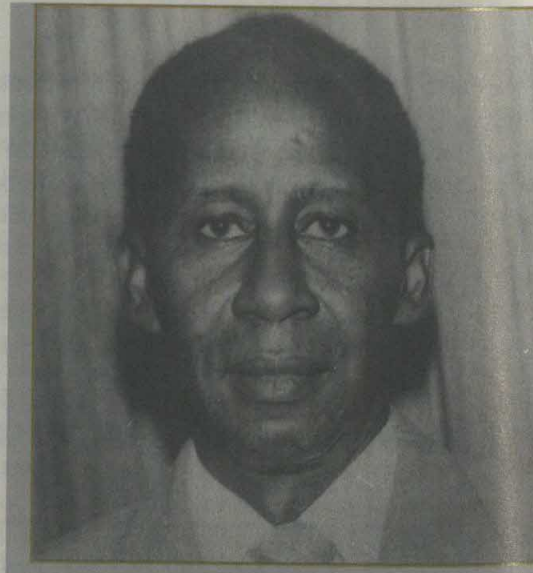
The thermal stations are located at Afam (700.9MW), Delta (820MW), Ijora (66MW), Sapele

PAST CHIEF EXECUTIVES OF NEPA



Engr. Yahaya A. Dikko  
General Manager, 1972 – 1979

Pix 2.3



Engr. Tata Askira  
General Manager, 1980 – 1985

Pix 2.4



Engr. D.A. Oyeyele  
General Manager, 1989 – 1990

Pix 2.5

(1020MW), Oji River (30MW), Egbin (1320MW); while the hydro power stations are at Kainji (760MW), Shiroro (600MW) and Jebba (578.4MW).

The largest and first major hydro electric station is the Kainji hydro electric power station which was built between 1965 and 1968. It was actually commissioned in 1969.

As part of the long term efforts of the Authority to ensure uninterrupted power supply nationwide, NEPA is involved in planning and construction of more power stations which are evenly located throughout the country. Some of the proposed power stations will be constructed at Geregu - 300MW and Zungeru - 950MW. Others will be sited at Mambilla, Onitsha, Lokoja, Makurdi, Ikom, Oji-River, Oron and Ajaokuta. The maintenance and rehabilitation of the existing ones are also given priority. For instance, some of the machines at Afam and Sapele power stations are being rehabilitated with loans provided by the World Bank. Negotiations have been initiated for the funding of rehabilitation works at the Egbin Thermal and Kainji Hydro power stations.

Table 2.1

TOTAL INSTALLED CAPACITY

HYDRO		STEAM		GAS TURBINE	
Kainji	760 MW	Egbin	1320 MW	Sapele	300 MW
Jebba	540 MW	Sapele	720 MW	Afam	700 MW
Shiroro	600 MW		2040 MW	Delta	876 MW
	1900 MW			Ijora	60 MW
					1936 MW

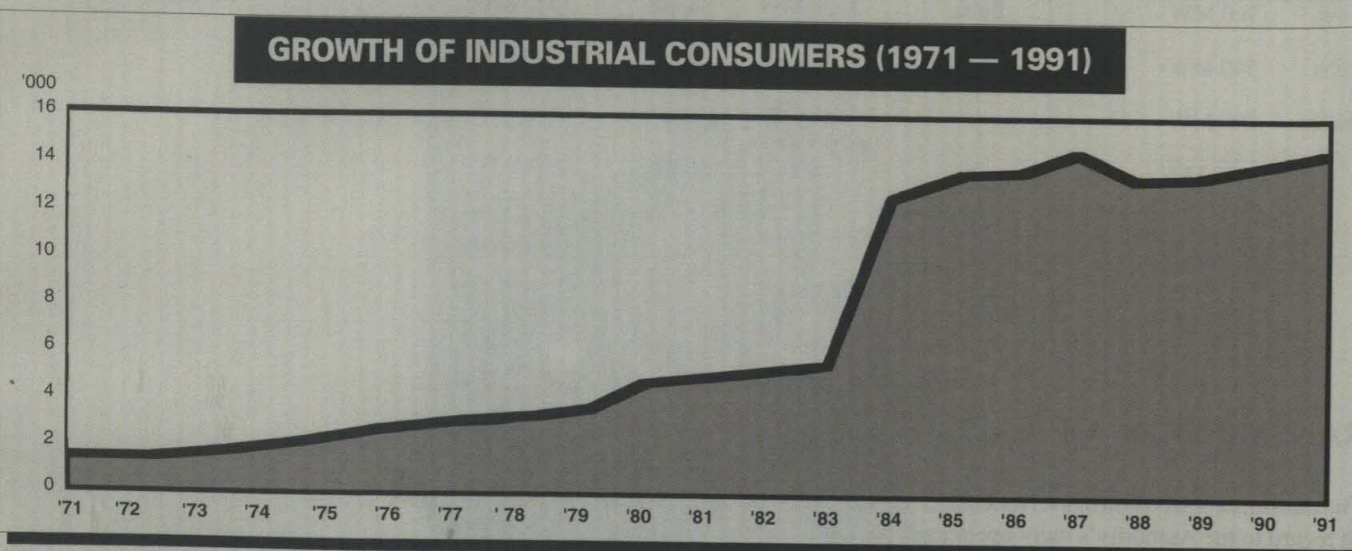
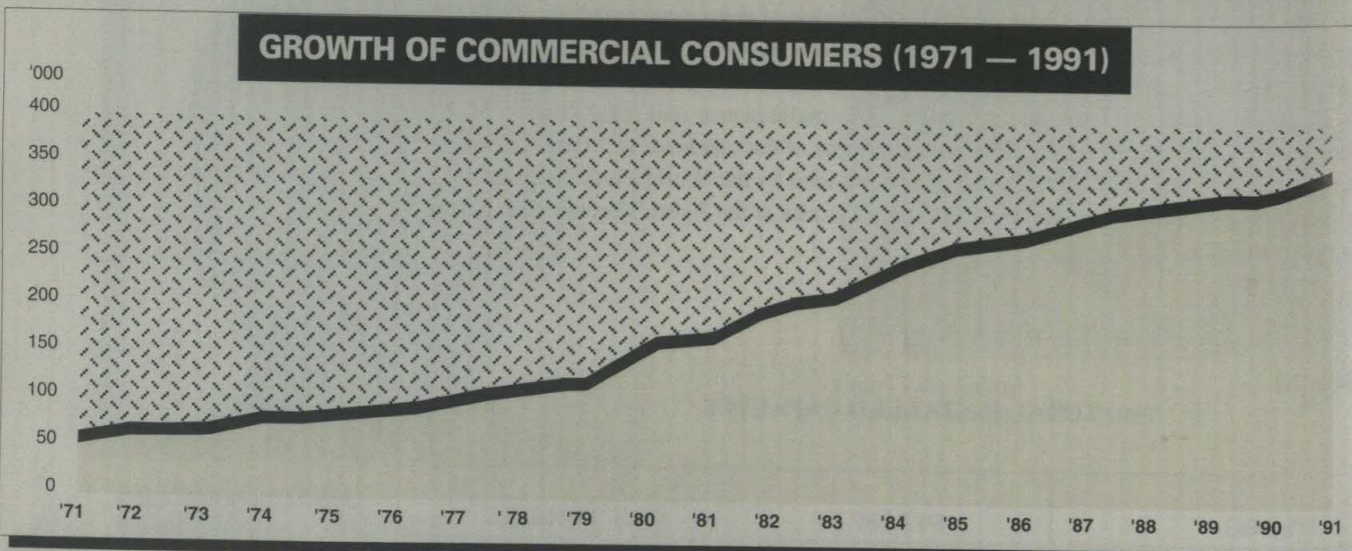
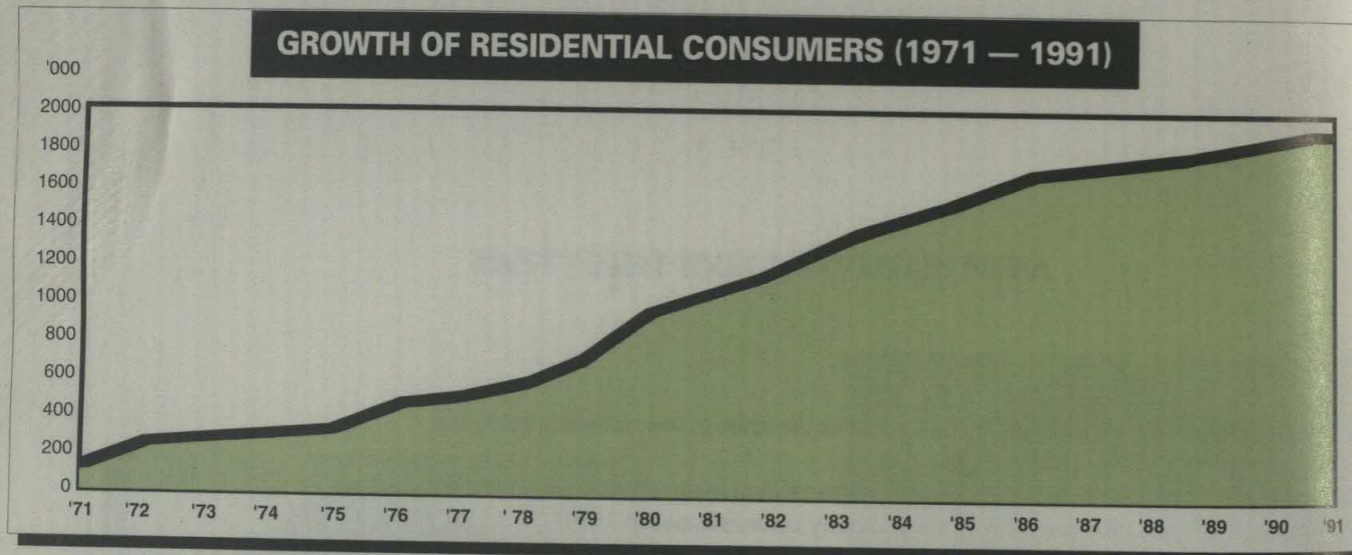
TRANSMISSION OF ELECTRICITY

The transmission division of the National Electric Power Authority plays a very vital function with regard to the Authority's daily operations.

Obviously, it is a vital link between the generating power stations and the distributions in terms of bulk transmission stations and transmission lines.

Between 1972 and 1991, the transmission division had constructed and extended its 330KV transmission lines from 1,260km to 5,000km, while the 132KV lines increased from 1,012km to 6,000km.

Indeed, the 132KV transmission network reached a peak of 11,000km in 1990.



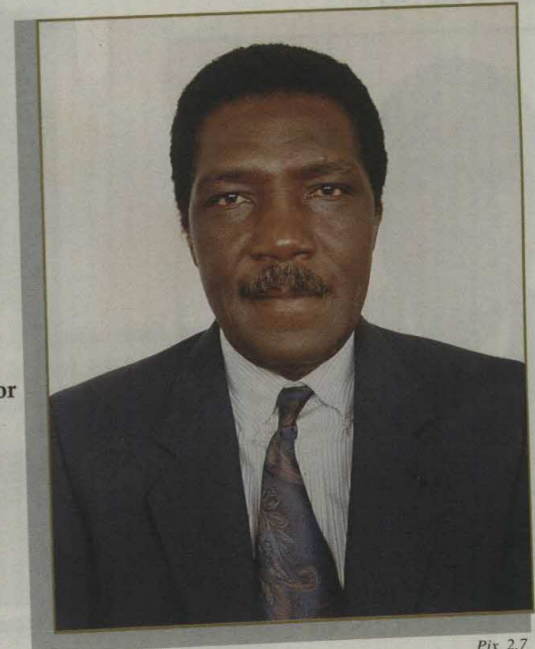
Source: Engr. H. Ibrahim; Electricity Industry in Nigeria and National Development

Graph 2.2



Engr. Ben Caven  
Executive Director  
(Generation and  
Transmission)

Pix 2.6



Engr. Ben. Atseyinku  
Executive Director, (Engineering)

Pix 2.7

Natural factors such as heavy rainfall and thunderstorm however continue to contribute largely to the system collapses witnessed by consumers all over the country, a problem which the Authority's management is poised to tackle so as to assure all the numerous consumers a stable supply of electricity. According to the Chief Executive of NEPA, Engr. Hamzat Ibrahim, the Authority is working round the clock to "eliminate system collapses, reduce system losses

Table 2.2  
NATIONAL GRID STATISTICS 1972-1992

DESCRIPTION	1972	1980	1992
330KV Transmission Line (KM)	1262	3677	5000
132KV Transmission Line (KM)	1012	3815	6000
330KV Substations	6	14	23
132KV Substations	14	65	91
Installed Capacity (MW)	606	1217	5876
Maximum Demand (MW)	330	1181	2362
Energy Generated (GWH)	1681	5724	15100 (est)

Engr. T.A.M. Balogun  
Executive Director (D&S) NEPA



Pix 2.8



Shiroro Hydro Power Station (600 MW) in Niger State

Pix 2.9

and improve upon the quality and reliability of electricity power supply throughout the country." Already, the visible and strong determination of the Authority in this direction is paying off with significant reduction in system collapse cases from 14 in 1989 to 11 in 1990 and mere 3 in 1991. This is an unprecedented record. At present, there are both short and long term plans to construct more transmission lines to re-inforce the existing ones, and thereafter ensure effective power transmission both within and outside the country as the case may be.

Table 2.3

MAJOR TRANSMISSION LINES PLANNED FOR CONSTRUCTION

330KV	132KV	
1. Gombe-Maiduguri	1. Akwanga-Lafia	11. Damboa-Askira-Mubi
2. Jos-Makurdi	2. Yola-Jalingo	12. Ota-Aiyetoro
3. Makurdi-New Haven	3. Akure-Ado Ekiti	13. Ondo-Okitipupa
4. New Haven-Alaoji	4. Okene-Lagos	14. Makurdi-Yandev-Wukari
5. Gombe-Yola	5. Kainji-Kaiama	15. Yandev-Ogoja
6. 2nd Benin-Onitsha	6. Ajaokuta-Okene	16. Itu-Uyo
7. Birnin Kebbi-Sokoto	7. Benin Main-Benin North	17. Nsukka-Ayangba
8. Shiroro-Abuja	8. Benin North-Agbor-Asaba	18. Yola-Jalingo-Bali-Nghu
9. Yola-Jalingo-Bali	9. Owerri-Ahoada	19. Nghu-Lekitake
10. Aba-Calabar	10. Bauchi-Ningi	20. Kano-Dutse
		21. Gombe-Damaturu
		22. Alaoji-Umuahia-Okigwe
		23. Maiduguri-New Marte
		24. Ile Ife-Ilesha
		25. Ilorin-Ogbomosho
		26. Shagamu-Ijebu Ode-Epe-Iwopin
		27. Afam-Onne
		28. Mayo Belwa-Ganye
		29. Kaduna (Mando)-Kaduna Refinery

DISTRIBUTION OF ELECTRICITY

The distribution division of the National Electric Power Authority is a major plank between generation/transmission divisions and final consumers of electricity. Indeed, it ensures that the numerous residential, commercial and industrial customers get both quantitative and qualitative supply of electricity.

The increasing social and industrial activities of consumers across the nation have continued to pose great challenge to the distribution division.

To meet the challenge, the distribution division keeps constructing 33KV and other distribution lines which it extends to the various customers as the needs arise.

Today, the total length of 33KV high tension underground lines is about 14,000km from about 500km in 1960. Similarly, the length of 11KV high tension underground lines, in 1990 covered over 18,000km as against 1000km in 1960. There is an upward provision of 10,833No. of 11KV/0.415k sub-stations. Also the electricity industry has developed radically during the last 20 years with a peak demand of 576MW in 1975 to 1329MW in 1981; and later 1855MW in 1987 and 2219MW in 1991. This represents an average annual growth of about 8 per cent.

Also, the population of consumers of electricity nationwide has been on the increase. It rose to over 2 million in 1990 as against 93,653 in 1960. This is a positive indication that both old and new consumers continue to enjoy high quality of services of the Authority at their convenience.

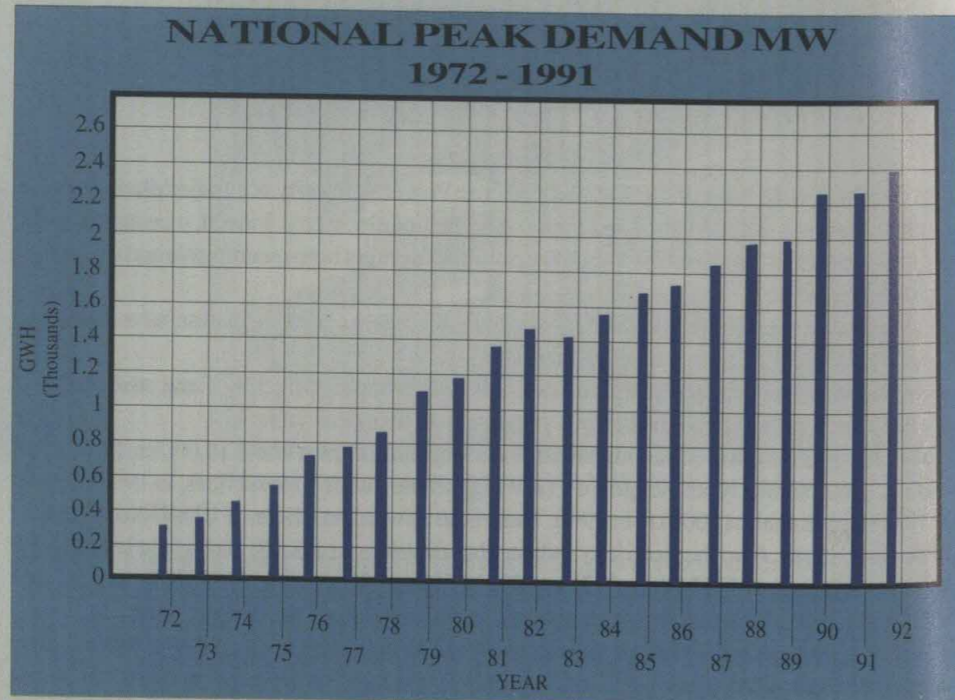
NEPA – 1985–1992

The growth and development of the electricity industry is one point of emphasis of the present



Engineer Bunu Sheriff Musa, receiving a plaque from AVM Nura Imam at NEPA's 20th Anniversary Award Night

Pix 2.10



Source: Engr. H. Ibrahim; Electricity Industry in Nigeria and National Development Graph 2.3

administration under President Ibrahim Babangida.

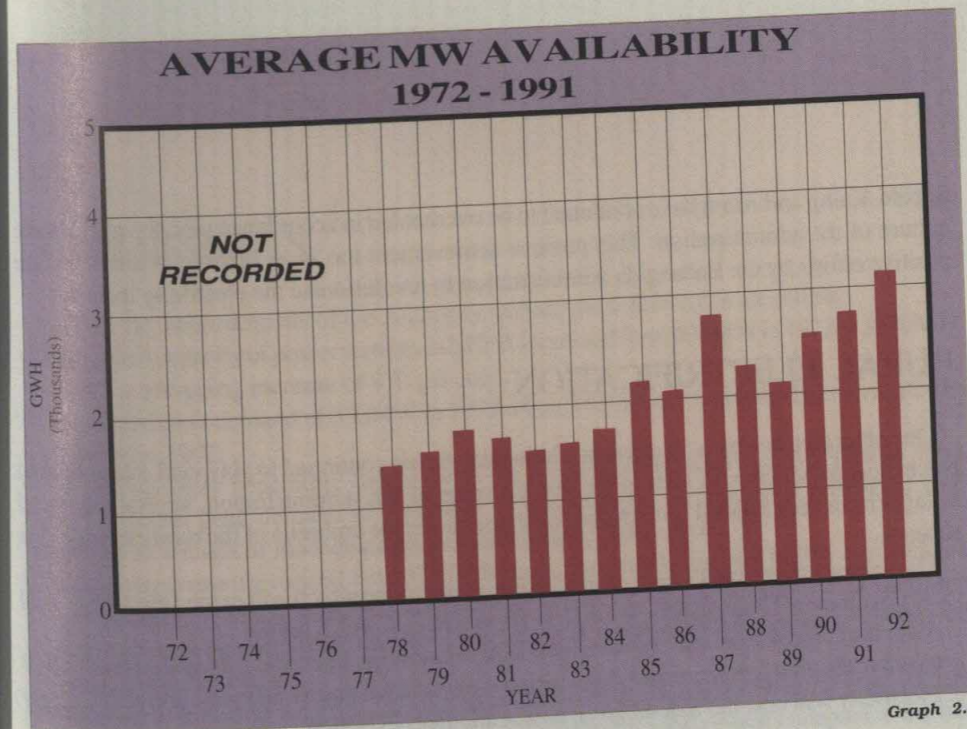
As part of the positive efforts of the present administration to guarantee uninterrupted power supply, the Federal Government has continued to ensure that positive support is given to NEPA as at when due.

In fact, that President Ibrahim Babangida was present physically to commission the Lagos thermal power station, Egbin (1320MW) in 1986, Shiroro hydro power station (600MW) in



The Minister of Power & Steel, AVM Nura Iman and members of Board of Directors of NEPA visit President Ibrahim Babangida at Abuja as part of NEPA's 20th Anniversary ceremonies

Pix 2.11



Graph 2.4

Source: Engr. H. Ibrahim; Electricity Industry in Nigeria and National Development

1990, and Delta IV power station (600MW) in 1991 is an obvious testimony of the commitment of the present administration towards the electricity industry as a whole, and the National Electric Power Authority especially.

Under the present administration too, the Authority's generating power plants at Ogorode,



NEPA's Assistant General Manager (Public Relations) Chief Adesola Macaulay shows the Deputy Governor of Niger State, Alhaji Jibo Garba round the NEPA Stand at the Lagos International Trade Fair

Pix 2.12



Sapele, Kainji and Afam have continued to be overhauled in accordance with the maintenance culture of the administration. This positive achievement too is an obvious testimony of the positive efforts by the Babangida administration to revolutionise the electricity industry.

### RURAL ELECTRIFICATION

One other area in which the present administration has continued to play vital role is the rural electrification scheme. In fact, in the last six years of this administration, several towns and villages have been hooked up to the national grid under the umbrella of the rural electrification scheme.

The federal government's rural electrification programme which will extend electricity to all local government headquarters in the federation will cost N2.5 billion.

Also, the construction and extension of 33KV distribution lines and substations and 132KV network to the nine newly created states which is expected to ensure adequate and stable supply of electricity will cost the federal government another N3 billion.

### COMMERCIALISATION OF NEPA

The commercialisation of NEPA, like many other federal and state parastatals was meant to ensure an efficient and appropriate allocation of human and material resources.

Under the partial commercialisation of NEPA, the authority has continued to take measures that will ensure effective performance of its duties. Moreover, it has continued to ensure that the quality and quantity of electricity available to all categories of customers is adequate and reliable.

To ensure that employees of the Authority are motivated adequately, appointment and promotions in the various positions have been made at all levels.

Indeed, the appointment of Engr. Hamzat Ibrahim as Managing Director/Chief Executive of the National Electric Power Authority in September, 1990 marked a turning point in the federal government's positive disposition to commercialise the authority. The greatest challenge of the present circumstance is that the right human and material resources must be appropriately mobilised and utilised at the right time.

### ACHIEVEMENTS

Some of the achievements of the Authority include the following in an outline:

- The installed capacity of power stations in NEPA increased from 606MW in 1972 to 5876MW in 1992, a whopping increase of 970 per cent.
- The national peak demand of 330MW in 1972 when NEPA was established has increased to 2362MW in 1992.
- The average daily generating capability of the power stations has risen to 3500MW for a present system peak demand of 2362MW. Consequently, incidences of prolonged load shedding as a result of inadequate generation capacity have ceased.
- The highest generating capability of 3785MW since the establishment of NEPA was attained on September 17, 1992. This figure is expected to rise with the completion of the on-going rehabilitation programmes for the power stations and sustained maintenance and improved management strategies.
- The number of transmission grid faults has reduced considerably, and for over a year now, there has been no total system collapse. The average number of total system collapses in the last ten years had been about 17 per annum.
- Training and development of skilled manpower to maintain the Authority's facilities.
- Specialised functions have been successfully accomplished by in-house teams including:
  - Design, erection and commissioning of 132KV transmission lines and substations.
  - Erection and commissioning of 330/132/33KV transformers and associated equipment.
  - Erection and rehabilitation of 330KV and 132KV SF6 circuit breakers.
  - Reactivation of SCADA remote control monitoring equipment at Oshogbo National Control Centre.

From all indications, the story of the National Electric Power Authority so far is one of success in spite of all odds. Moreover, there is room for necessary improvement especially given the firm support that the Authority is getting from the Federal Government and the private sector.

## Chapter 3

# AJAKUTA STEEL COMPANY LIMITED

## HISTORY

The Federal Government of Nigeria began to show interest in the establishment of iron and steel industry as far back as 1958. Initially, the government was interested in the establishment of rolling mills, but with the growing awareness of the existence of coal, iron ore and other relevant raw material deposits in the country, emphasis was later shifted to establishing an integrated steel plant. Thus, between 1960 and 1967, the Federal Government invited and received proposals on the feasibility of establishing an integrated steel plant in Nigeria from foreign firms including those from the United Kingdom, USA, Germany, Canada and USSR. The proposal from the USSR was more realistic and most encouraging. So, in 1967, a team of Soviet experts arrived in Nigeria to conduct a more detailed feasibility study on the establishment of an integrated steel plant as part of a follow-up on a technical/economic cooperation agreement between Nigeria and the USSR. Between 1968 and 1973, geological and technological explorations were carried out jointly by Nigerian and Soviet experts to determine the resources and the suitability of local raw materials required to set up the integrated steel plant. The work was carried out under the auspices of Nigeria Steel Development Authority (NSDA). By the end of 1973, major aspects of the survey were completed and it was recommended that an integrated steel plant based on the blast furnace process can be established in Ajaokuta with majority of local raw material inputs.

After accepting the Preliminary Project Report (PPR) in 1974 from M/S V/O Tiajpromexport of USSR, the Nigerian government commissioned the same organization to prepare the Detailed Project Report (DPR). The DPR was submitted in 1977 and accepted in 1978 after detailed discussion. In 1979, the government signed the Global Contract with M/S V/O Tiajpromexport for the preparation of working drawings, supply and erection of equipment, structures and materials; and the training of personnel for the Ajaokuta Steel Project. The civil works contract was awarded to Dumez, Fougerolle and Bilfinger + Berger. PACS-MECON of India were appointed the consultants. Ajaokuta Steel Company Limited, a wholly government owned company was established in 1979 with the responsibility for the project implementation and operations of the steel plant complex when completed.

## LOCATION AND SELECTION OF TECHNICAL PARTNERS

Ajaokuta Steel Plant is located in Kogi State on the west bank of the River Niger, some 546 kilometres north of the Atlantic ocean. The plant is located on a completely green field area where the construction of such a project calls for parallel development of extensive infrastructure and township. The site is selected for the following reasons:

- (i) Proximity to the sources of some of the principal raw materials such as iron ore, dolomite, limestone and clay.
- (ii) Accessibility by river for bulk transportation up-stream and down-stream of raw materials, consumable materials and finished products.
- (iii) Availability of land for both the plant and township development.
- (iv) Availability of abundant fresh water supply for the operations of the plant and for domestic requirements.
- (v) Best soil characteristics for foundation works and other techno-economic considerations.

The design of Ajaokuta Steel Plant is based on the blast furnace - basic oxygen furnace (BF-BOF) process route for the production of iron and steel. The process is further integrated downwards with continuous bloom casting, medium sections and rail mill, billet mill, light section mill and wire rod mill. The above integrated process route was selected for Ajaokuta based on the knowledge of the properties of the relevant raw materials available locally, the level of industrialization in the country, capital investment costs, overall operating costs, infrastructural requirements, manpower readiness and the level of technical skills available in the country. The BF-BOF process route is the most versatile means of producing large quantities of crude steel. Over 90 per cent of the world output of crude steel is produced through this process line. The process is usually referred to as the "conventional process" because of its wide acceptance and applicability. These are some of the rationale behind the selection of the BF-BOF process route for Ajaokuta.

M/S V/O Tiajpromexport are the major technical partners responsible for the preparation of working drawings, supply and erection of equipment and the training of personnel for the steel plant. The selection of M/S V/O Tiajpromexport as the major technical partner was based purely on merit. Foreign firms from UK, USA, Canada and Germany carried out studies and tests, almost a decade without appreciable success before M/S V/O Tiajpromexport of USSR was invited. The successful result of the Preliminary Project Report (PPR) submitted by M/S V/O Tiajpromexport in 1974 coupled with the existence of bilateral relationship between Nigeria and USSR covering techno-economic agreements since 1967 made M/S V/O Tiajpromexport the most appropriate technical partners for the project.

Similarly, M/S PACS-MECON were appointed the consultants of the project in recognition of the fact that India and the Soviet Union had long established close technical cooperation between themselves, particularly in the field of steel plant construction and operations. The Soviet Union has successfully built two major steel plants in India, each with annual capacity of 4.0 million tonnes of crude steel. Apart from being a friendly nation with USSR, India has a first hand experience in acquiring technology transfer with respect to steel plant development from the Soviet Union. It is therefore clear that the choice of PACS-MECON as the major consultant is aimed at creating the most amicable atmosphere for accelerated assimilation of technology from both the technical partner and the consultant.



Former President Shehu Shagari laying the foundation stone of the Ajaokuta Steel Complex, June 18, 1981

Pix 3.1

## PRESENT STAGE OF IMPLEMENTATION

Ajaokuta Steel Plant is planned to be built in three stages. The first stage of 1.3 million tonnes to produce long steel products was followed by immediate expansion to 2.6 million tonnes for the production of 1.3 million tonnes of flat products in addition to the long products. The third stage is the expansion of the complex to produce 5.2 million tonnes of various types of finished and semi-finished steel products including heavy plates and heavy sections. However, the plant is designed such that it can be expanded up to 10 million tonnes eventually, subject to demand.

Actual construction of the first stage started in 1979 and reached full tempo in 1982. By 1983, the civil works started to slow down which eventually affected the pace of the erection works as well. The civil works slowed down as a result of global recession and high inflation rates resulting into increased labour and material costs beyond what was envisaged in the contracts. Funds allocated for the civil contracts were therefore exhausted prematurely.

## AJAOKUTA STEEL COMPANY SINCE 1985

Since the advent of the Babangida regime, significant achievements have been made in Ajaokuta.

As mentioned earlier, the global recession affected the tempo of the civil construction. But after negotiations with the civil contractors, work resumed in earnest. However, because of the delay encountered, the plant which was re-scheduled to be fully commissioned in 1988, was

shifted till a later date. Broadly speaking, over 97 per cent of the civil works and over 93 per cent of the erection works have been completed. Already, three rolling mills have been commissioned. The Light Section Mill which was commissioned in 1983 has rated capacity of 400,000 tonnes of merchant products, bars and rods. The Wire-Rod Mill with rated capacity of 130,000 tonnes of wire rods and coils was commissioned in 1984. The Billet Mill was commissioned in the first quarter of 1986. The Billet Mill with capacity of about 795,000 tonnes will produce billets for the commissioned mills, and saleable billets to other rolling mills. It will be fed with imported blooms initially until the continuous bloom casting unit is commissioned. By the end of 1992, the Medium Section and Rail Mill were expected to be commissioned. The product mix of this mill will consist mainly of rails, medium sections and structurals. Other auxiliary units and repair shops facilities will also be completed before the end of 1992 to have the plant fully integrated and self reliant.

The development of external infrastructures which are independent of the civil works, is virtually completed and the structures are at present serving the needs of Ajaokuta. The 330 KV power lines and the substations are completed and energised. Natural gas pipeline from Oban in Edo State reached Ajaokuta since 1983. Since then it has been serving the steel plant with sufficient natural gas. Similarly, the river port at Ajaokuta is completed and the steel plant is well connected with road networks. The steel township at Ajaokuta is being developed to provide accommodation and other facilities to over 10,000 workers at site. Apart from the railway line to link Ajaokuta with Itakpe iron ore deposit, and the dredging of the River Niger up to Ajaokuta, the steel plant can be regarded as well connected with infrastructure.

### PLAN FOR THE FUTURE

The Federal Government of Nigeria is determined to commission the immediate expansion of Ajaokuta Steel from 1.3MT to 2.6MT to produce flat products as envisaged in the Detailed Project Report (DPR). This determination is motivated by the realisation of the fact that Nigeria, and indeed the West African sub-region, must pursue economic development based on strong indigenous steel industry capable of producing varieties of high quality steel products to meet internal market demands. Short of this, the economy of the sub-region will continue to depend on an increasingly hostile international market for survival. Technical considerations such as the existence of planned infrastructure, the necessity to achieve optimal capacity of 2.6MT minimum for stable operation of the complex make the expansion of Ajaokuta Steel Plant a more attractive alternative to any other site ever considered for the production of flat product steel in the sub-region.

The first stage of 1.3MT has product mix consisting of long products only. Such steel products are used mainly in the development of basic infrastructure required in a country for proper industrialisation. The product mix of the second stage will consist mainly of hot rolled coils and sheets, cold rolled coils and sheets, galvanized and tinned sheets and coils. These products are the major input materials in the manufacture of durable goods such as cars, household goods and appliances, agricultural implements and the canned containers. These are quite distinct from their use in the construction industries. It is clear that the product mix for both the first and the second stage at Ajaokuta are highly needed. Since there is delay in the completion of the first stage, and there is great demand for the products of the second stage, the government of

Nigeria considers it necessary to start the second stage of Ajaokuta parallel with the first stage instead of in series as was previously envisaged.

The second stage is expected to be fully completed and integrated with the mainstream by the year 1995. However, just like in the first stage, the second stage will be constructed by backward integration with the Hot Strip Mill (HSM), Cold Tandem Mill (CTM) and the coating lines to come up first. The coke ovens, the blast furnace, steel making and the slab casting units are to come up last. The rolling mills and the finishing lines will be fed with imported slabs so that Ajaokuta Steel Plant will be able to produce the much needed flat steel products by 1996.

It is note worthy to mention that the following units of the steel plant have been commissioned:-

- (i) 320 mm Light Section Mill;
- (ii) 150mm Wire Rod Mill;
- (iii) Recirculating Water System No.3 including Pump Houses;
- (iv) Main Step Down Substation No.1;
- (v) Block of Mechanical Repair, Heat Treatment and Hard Surfacing Shops; and
- (vi) Workshop of Billet Mill and Medium Section Mill.

The other principal units of the steel plant are under construction and civil engineering and erection works have crossed the 90 per cent mark for each of the units.



President Ibrahim Babangida, commissioning some completed units of the complex in 1990

Pix 3.2

Table 3.1

CHARACTERISTICS OF THE PRINCIPAL UNITS AND FACILITIES

PRINCIPAL UNIT	NUMBER OF EQUIPMENT	CAPACITY	PRODUCT
<b>A. Iron Making Plant</b> - Coke Oven - Sintering Plant - Blast Furnace	2 Batteries (49 Oven) each 1 strand 1 No. (2 During Expansion) 24 Nos Tyres, 2 Nos Cast houses	450,000/yr 3.24Million t/yr 2000m3 useful volume	Coke Sinter Liquid Pig Iron
<b>B. Steel Making</b> - Mixer - Oxygen Converter  - Continuous casting	1 No. 2 Nos.  3 Nos. Curvilinear machine 2 strands each	1300 tonnes 130 tonnes nominal capacity each 260x260mm, 260x260mm	Liquid Steel  Blooms
<b>C. Rolling Mills</b> - 900/630mm Billet Mill  - 700m Medium Section and  - 320mm Light Section and Bar Mill  - 150mm Wire Rod Mill  - Repair - Foundry  - Forge and Fabrication Shop	1 No.  1 No.  1 No.  1 No.	795,000 t/yr  560,000 t/yr  400,000 t/yr  130,000 t/yr	100mmx100mm billets 9-12 long, 150mmx, 150mm billets, 6-10m long  1 - beams Broad Flange beams, channels angles, Strips  Equal angles, Hexagons squares, Strips, rounds, T-beams and channels  Wire Rod (in coils) Reinforcement steel (in rods)  Castings facilities Forgings  Steel structures

Table 3.1 contd.

PRINCIPAL UNIT	NUMBER OF EQUIPMENT	CAPACITY	PRODUCT
- Power Equipment Repair Shop Mech. Repair Shop			New spare parts; spares reclamation; heat treated parts; electrical machines; overhaul repairs, medium repairs, and routine repairs
- Block of pattern making and building repair shop,  D. Auxilliary Facilities  - Refractories and Lime production  - Thermal power plant and Turbo Blower station (TPP-TBS)  - Gas Facilities - Oxygen Facilities - Water Supply and Sewerage  E. Electric Power Supply  - 132KV Over-head line from NEPA 330/132KV grid substation (2Nos.)  F. Transport Facilities  - Internal Rail Transport  G. General Plant Services  - Laboratories and Communication Systems		2x55MW	Electric Energy                 65 Kilometres

Table 3.2

PRODUCTS OF ASCL

1. 150mm WIRE ROD MILL		
(a) Wire Rods (in coils)		
5.5mm (3/16 in)	8mm (5/16 in)	12mm (1/2 in)
6.0mm (1/4 in)	10mm (3/8 in)	
(b) Reinforcement Steel Rods		
6mm (3/16 in)	10mm (3/8 in)	
8mm (5/16 in)	12mm (1/2 in)	
2. 320mm LIGHT SECTION AND BAR MILL		
(a) Plain and Ribbed Rounds		
10mm (3/8 in)	16mm (5/8 in) (13/16)	
12mm (1/2 in)	20mm (3/4 in)	
14mm (g/16 in)	25mm (in)	
(b) Equal Angles	(e) Hexagons	
25mm x 25mm x 3-4mm	10-30mm	
35mm x 35mm x 3-4mm	(f) Squares	
40mm x 40mm x 3-4mm	10mm-30mm	
50mm x 50mm x 5-6mm		
(c) Tees	(g) Flat Strips	
30mm	6mm - 12mm x	
40mm	12mm - 70mm	
50mm		
60mm		
(d) Channels		
30mm x 15mm		Finished products
40mm x 20mm		are produced in
		lengths of 45mm x 25mm 6-12mm
3. 700mm MEDIUM SECTION AND STRUCTURAL MILL		
(a) Angles		
(i) Equal angle 70mm x 70mm x 11mm to 130mm x 130mm x	12-14mm	
(ii) Unequal Angle 80mm x 50mm x 5-6mm x 60mm x 100 x 9 -	14mm	
(b) Beams		
(i) 1 beams (standard) 80mm - 220mm		
(ii) 1 beams (parallel) 80mm-300mm		
(iii) Lighter 1 beamsss (with thin webs) 160mm-300mm		
(iv) Broad Flange beams	100mm-160mm	
4. 900/630 SEMI-CONTINUOUS BILLET MILL		
(a) 100 x 100mm Billets		
9 - 12 m long		
(b) 150 x 150 Billets		
6 - 10 m long		
(c) 100 x 100 Billets		
12 m long (for sale)		



Pump House

Pix 3.3



Former Hon. Minister of Steel, Mallam Mamman Ali Makele on a visit to ASCL in 1981

Pix 3.4



Rollers of the Medium Section/ Structural Mill

Pix 3.5

Former Minister of Steel, Paul Unongo listening to steel contractors in 1979



Pix 3.6

Blast Furnace capable of producing 1.3 million tonnes of liquid iron a year



Pix 3.8



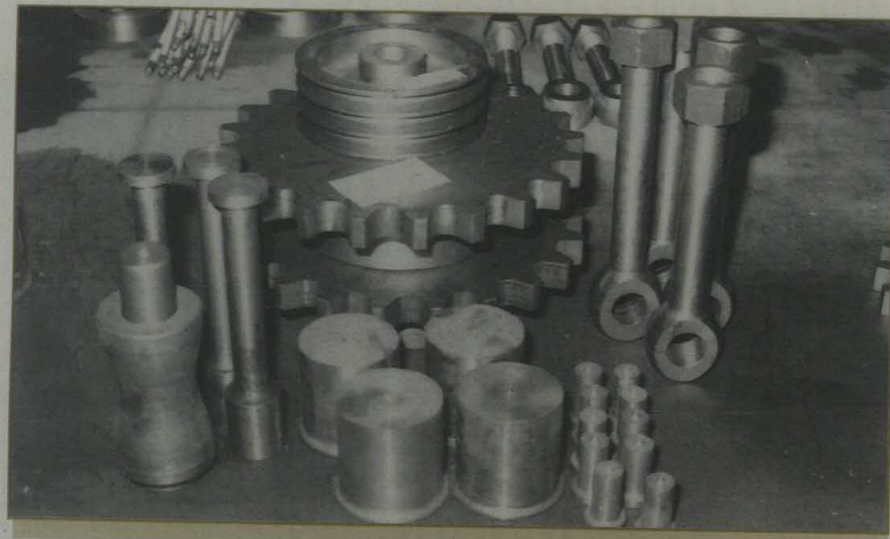
Former Minister of Mines, Power & Steel, Engr. Bunu Sheriff Musa listening to an explanation on township development at the Steel city while ASCL's GM and other officials look on (1987)

Pix 3.7



Forge shop

Pix 3.9



Spares from the machine shop

Pix 3.10

Inspection visit by AVM Nura Imam (Rtd)



Pix 3.11



Machinists at work at the M.R.S.

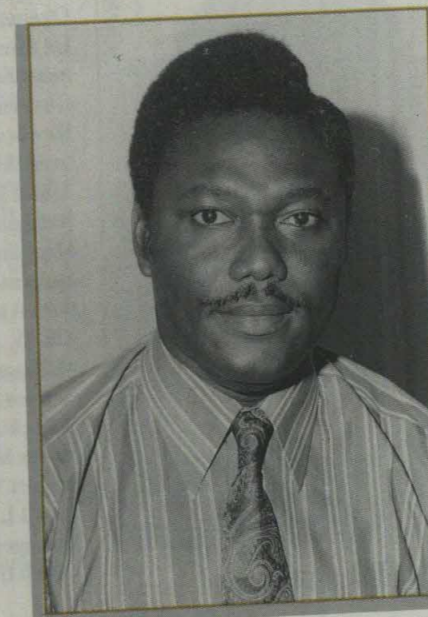
Pix 3.12

## PROFILE OF CHIEF EXECUTIVES SINCE 1971

Akinwunmi Adegboye was born in 1932.

A holder of B.Sc. Honours (Mechanical Engineering) and D.I.C. (Production Engineering), Engr. A. Adegboye worked with Federal Ministry of Works and Surveys, Ministry of Defence/Defence Industries Corporation, Federal Ministry of Industries, and finally seconded to the National Steel Development Authority as Project Manager in 1971.

He has attended many international seminars, courses and conferences and has several patented inventions to his credit. A member of many professional bodies, Engr. Akinwunmi Adegboye retired voluntarily from public service on July 1, 1980.



Pix 3.13

Eng. A. Adegboye (1971-1980)



Pix 3.14

Engr. F.C. Ezemenari (1980-1984)

DR. F.C. R. Ezemenari left Christ the King's College, (CKC) Onitsha in 1949 with the ambition of becoming a priest.

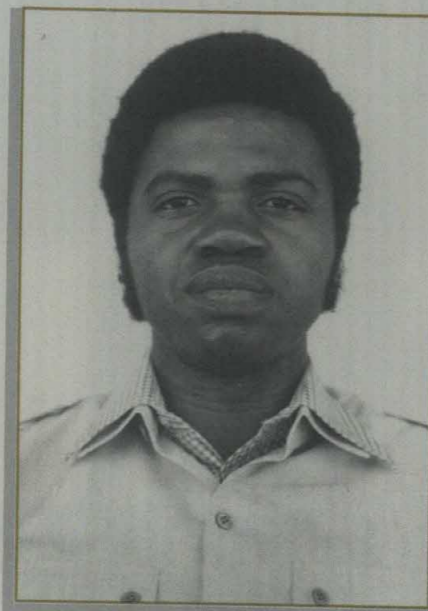
After spending three years at Bigard Senior Seminary, Enugu, he went to the University College, Dublin, where he obtained Bachelors degree in Chemistry and Pure Mathematics.

He came back to Nigeria in 1957 to teach at his alma mater and later at Government College, Umuahia.

A holder of three Bachelors degrees, Dr. Ezemenari left Belfast for Canada where he registered at the University of Calgary for his Doctorate programme. He completed the programme on Aspect of Nuclear Physics and Stratospheric Circulation.

Dr. Ezemenari was appointed ASCL General Manager and Chief Executive in 1980 and served till 1984.



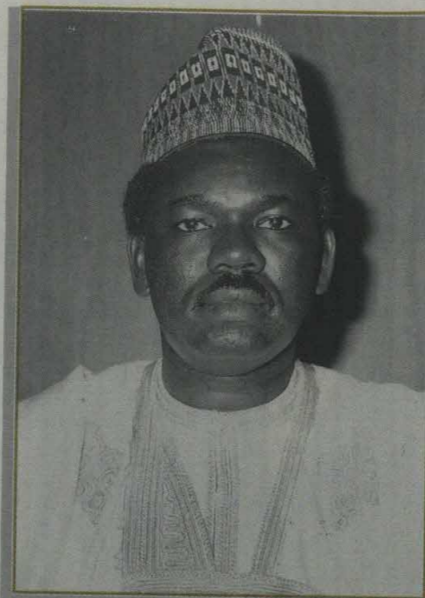


Alhaji Idris I. Atta  
(Sept. 1984)

Pix 3.15

A mechanical engineer by training, Alhaji Idris Ibrahim Atta was born on January 18, 1947 in Okene, Kogi State. He attended the U.N.A. School, Okene, Government Secondary School, Dekina and the Federal Government College, Warri. He obtained his B.Sc Mechanical Engineering from Ahmadu Bello University, Zaria in 1971. Alhaji Idris I. Atta joined the services of the National Steel Development Authority as a Mechanical Engineer and in 1980 he was appointed a Deputy General Manager (Production) Ajaokuta Steel Company Limited. Alhaji Attah has attended so many courses within and outside the country. These include courses in Computer Application Programming at the University of Lagos, a U.N. Fellowship course in Steel Making Technology in USSR, and Project Manager Course in India. Alhaji I. I. Atta was appointed Acting General Manager and Chief Executive from January and served till September, 1984.

Born on the August 15, 1942 at Bakori, Katsina State, Engr. M. M. Inuwa had his early education in Katsina Central Primary School and Barewa College, Zaria. In 1966, Engr. Inuwa went to the Royal School of Mines, London University to study Extraction Metallurgy. He has had varied working experiences at Makeri Smelting Company Limited, Jos, New Nigeria Development Company Ltd., and National Grains Production Co. Ltd. He became the General Manager and Chief Executive of Ajaokuta Steel Company Limited from October 1984 to December 1989. Engr. Magaji Mohammad Inuwa attended various professional courses in institutions outside the country among which are Royal School of Mines, London University (Extraction Metallurgy), Harvard University U.S.A. (General Management courses and programme for management development).



Engr. Magaji Inuwa  
(Oct. 84- Dec. 89)

Pix 3.16

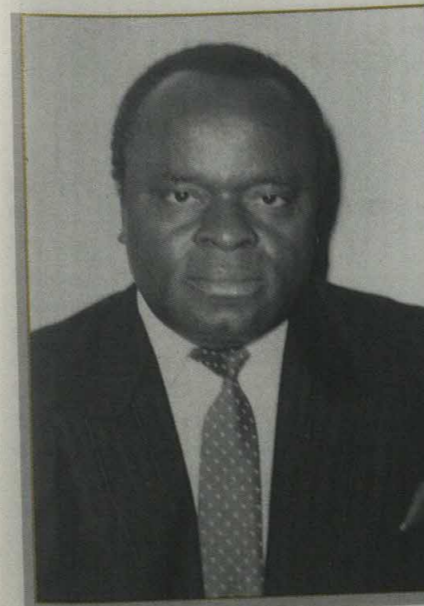
Born on August 7, 1950, Group Captain Ndatsu Umaru had his early education at Native Authority Primary School, Lokoja from 1956 to 1962. He proceeded to Government College, Kaduna (1963-67) and Secondary School, Bida (1968) for his post primary education. After his secondary education, Group Capt. Umaru got admitted into the famous Nigerian Defence Academy in 1968 and subsequently commissioned into the Nigerian Airforce in 1971. Over the years, he has attended a number of professional courses both at home and abroad. A one time military governor of Kwara and Kano States, Group Captain Umaru, a member of the Institute of Electrical Engineers and Institute of Electronic and Radio Engineers, was appointed the Chairman and Chief Executive, Task Force on Ajaokuta Steel Company between December, 1989 and September, 1990. He has since gone back to his military duties.



Group Captain Ndatsu Umaru  
(Dec. '89 - Sept. '90)

Pix 3.17

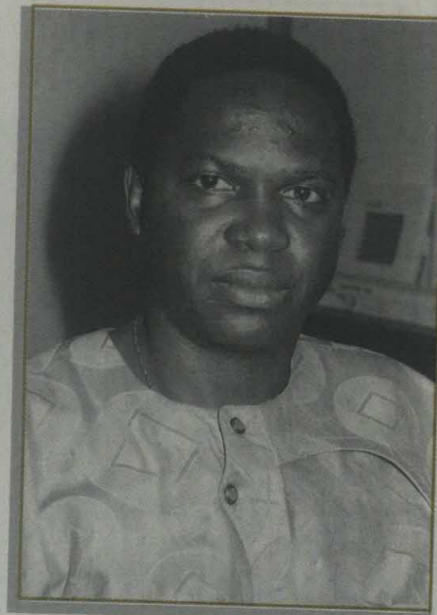
Engr. (Dr.) Philip Nwabueze Atanmo was born in 1940. A Ph.D holder in Metallurgical Engineering; Dr. Atanmo has had varied working experiences in Nigeria and overseas. When he returned to Nigeria, Dr. Atanmo worked first with the Federal Ministry of Industries, Lagos, as a Principal Engineer coordinating the technical activities of consultants and contractors handling the execution of the Delta Steel Plant. Later, he joined Delta Steel Company as Chief Engineer in charge of sourcing and testing of potential raw materials. He was appointed Project Director and Chief Executive, Ajaokuta Steel Company Limited in October, 1990. Dr. Atanmo is a member of many professional bodies, Fellow, Nigerian Society of Engineers, the Nigerian Metallurgical Society, a member of the American Institute of Electrical Engineers, American Institute of Metallurgical Engineers and has several patents in foundry technology to his credit.



Engr. (Dr.) Philip Nwabueze Atanmo  
(October '90)

Pix 3.18

PROFILES OF MANAGEMENT STAFF



Engr. Bayo Kolade  
DGM (Commercial)

Pix 3.19

Engr. Bayo Kolade is a distinguished mechanical engineer born in July, 1950, at Ikare Akoko. He had his early education at St. Stephen's Anglican School, Ikare, before he proceeded to Victory College also in Ikare for his secondary education.

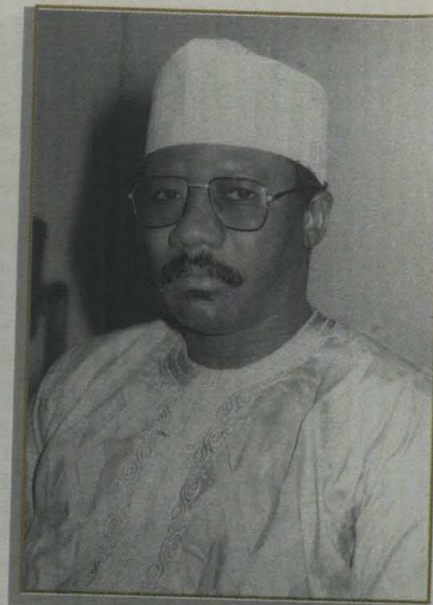
Engr. Bayo Kolade began his post secondary education at the University of Lagos in 1968, and graduated in 1971 with a B.Sc Mechanical Engineering degree.

He joined the Ajaokuta Steel Company Limited in 1979 as a Senior Manager and rose to become the Deputy General Manager (Technical Services), a position he held until he was appointed General Manager and Chief Executive for Oshogbo Steel Company in 1986. He was later transferred to Ajaokuta Steel Company in 1990 as Deputy General Manager in charge of Commercial Department.

Engr. Garba A. Usman, attended the Brunel University, Oxbridge, Middex, for his Bachelor's Degree in Metallurgy where he finished in 1977. Between 1980 and 1982, he was at the Sheffield University and Bradford University for his Masters Degree Programmes in Metallurgy and Business Administration respectively.

He attended several international courses and workshops and worked both in the United Kingdom and Nigeria before his new appointment.

Until his appointment, Engr. Usman served at the National Productivity Centre as an Assistant Director and had also served as a Task Force member in Ajaokuta.



Engr. Garba A. Usman  
DGM (Production)

Pix 3.20

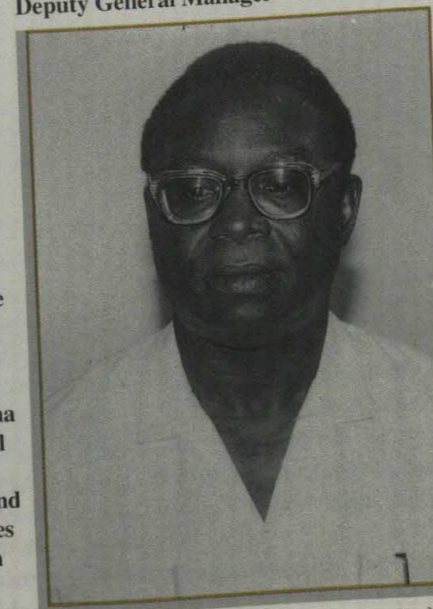


Hon. Nuhu Audu  
DGM (Admin)

Pix 3.21

Hon. Nuhu Audu was born on November 30, 1948, at Aloji in Kogi State. He had his secondary education at Government College, Kaduna, before proceeding to Government College, Zaria for his H.S.C. Hon. Nuhu Audu later went for his University Education at Ahmadu Bello University, Zaria. Before his present appointment, Hon. Nuhu Audu held the post of Assistant General Manager (Industrial Relations) 1985 - 1986, Assistant General Manager (Establishment) and lastly, Assistant General Manager (Administration). He joined Ajaokuta Steel Company in 1980 as a Chief Personnel Officer.

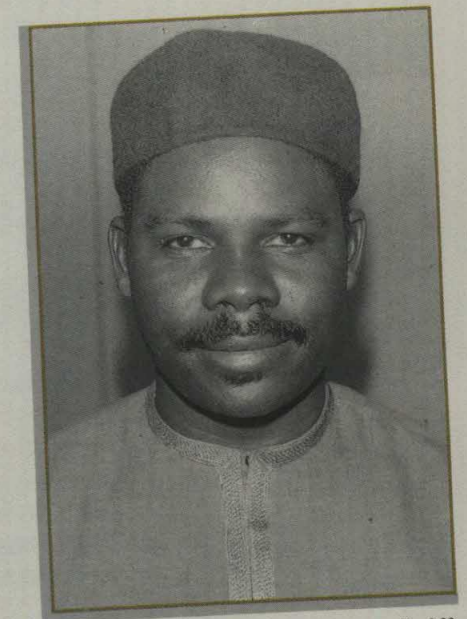
Mr. Woke Weli Chioma  
Deputy General Manager



Pix 3.23

Born at Rumuokani, Ogbokiri, Rivers State on January 18, 1944, Mr. Woke Weli Chioma studied Accountancy at South West, London. Until his present appointment, he was an Assistant General Manager (Finance) in the Company.

A holder of the Associate Certificate of Chartered Accountants (ACCA), Mr. Woke Weli Chioma was previously an Acting General Manager, Pabod Finance and Investment Company Limited, and Chief Accountant, Pabod Supplies Limited, before joining Ajaokuta Steel Company in 1987.



Alhaji M. Aminu Kani  
(DGM Tech. Services)

Pix 3.22

Until his appointment, he was the Special Adviser to the Honourable Minister, Federal Capital Territory Abuja, and later Special Adviser to the Minister of Special Duties. He was previously the Managing Director of the Kano State Urban Development Board and a permanent secretary in the Military Governor's office, Kano. Born on December 12, 1950, he had his education in Hadejia, Jigawa State, Barewa College, Zaria and Ahmadu Bello University, Zaria. Alhaji M. Aminu Kani, is an Architect by profession.

## Chapter 4

# DELTA STEEL COMPANY LIMITED, ALADJA

### HISTORY

The Delta Steel Project was conceived as one of the key industrial projects of the Third National Development Plan. In contra-distinction to Ajaokuta (blast furnace) Steel Project, the Delta Steel Plant uses the direct reduction - electric arc furnace route thereby utilizing the abundant natural gas of Nigeria's oil and gas fields.

The main agreement for plant construction and erection was signed on October 3, 1977, between the Federal Government of Nigeria and the Consortium Steel Plant A/Nigeria (CSA). The plant was to be integrated and to be capable of producing 1 million tonnes of liquid steel per year initially.

Work started at plant site in January, 1978 and the project was scheduled for completion during the last quarter of 1981.

On November 27, 1981, the Delta Steel Company commissioned its arc furnace and produced 111 tonnes of liquid steel using 100 per cent scrap feed. On the same day, the first continuous casting machine was also commissioned.

The contract for the execution of the Delta Steel Project was awarded to the Consortium Steel Plant A/Nigeria (CSA), a conglomerate consisting of West German and Austria steel makers and equipment and machinery manufacturers. The scope of the agreement was for an integrated steel plant consisting of such major production units as the pellet plant, the direct reduction plant, the electric steel making shop, the continuous casting plant, the rolling mill for light sections, the lime calcination plant and various utility and auxiliary units as well as offsites. All production and services units were to match the contract capacity of the steel melting shop which is rated at 1 million tonnes of liquid steel per annum.

In addition, CSA also accepted responsibility to train Nigerian personnel in various aspects of steel plant operation and administration as well as to provide back-up technical services during the early years of plant operation.

For project monitoring and construction supervision, a separate agreement was reached with the Metallurgical and Engineering Consultants (India) Limited in 1978.

At this time, the Delta Steel Project was under the ministerial supervision of the Federal Ministry of Industries. In 1979, a more dynamic approach for the speedy development of the steel industry in Nigeria was taken and a separate administration, the Steel Development Department in the Executive Office of the President was created.

The financial agreements ultimately agreed to by the government for the complete execution of the Delta Steel project was two-tiered, partly in equity share capital and partly in long term loans and offshore credits tied to the steel plant.

The integrated steel plant consists of five major production units, viz, the pellet plant in which iron ore is converted to iron oxide pellets and reduced to Direct Reduced Iron (DRI); the Steel Melting Shop where the DRI together with steel scrap are converted into molten steel; the



Chief R.F. Giwa  
Chairman, DSC

Pix 4.1

Chief Rufus Foluso Giwa was born on April 24, 1942, at Okeagbe-Akoko in Ondo State. After an early education in schools and colleges in Ondo State, Chief Giwa proceeded to the University of Lagos where he obtained a Bachelors degree in Accountancy in 1966.

He is the current Chairman, Board of Directors of Delta Steel Company, Aladja and Managing Director, Lever Brothers Nigeria, Plc. He sits on the Board of several companies.

Chief Giwa is a fellow of the Institute of Cost Management Accountants, Fellow of the Chartered Institute of Secretaries and Administrators, Fellow of the Institute of Chartered Accountants of Nigeria, Fellow of the Nigerian Institute of Management, and Fellow of the Institute of Directors. Chief Giwa is a member of the Councils of the Manufacturers' Association of Nigeria, the Lagos Chamber of Commerce and Industry, Nigeria-British Chamber of Commerce and Industry, and the Nigerian Institute of Management.

continuous casting plant where the molten steel is cast into billet and the rolling mills where the billets are rolled into structural long light bars and sections.

The above units are supported by various service and auxiliary units. These include the Lime Plant which provides burnt lime used as flux in steel making and hydrated lime used as binder in the Pellet and Direct Reduction Briquet Plants; the Oxygen/Nitrogen Plant which provides oxygen for steel making and firing of burners as well as nitrogen used as seal gas and instrument air; the Foundry which cast crusher balls employed in iron ore grinding in the Pellet Plant as well as various workshop services in the areas of mechanical, electrical, electronic, instrumentation, civil, heavy and light industrial equipment maintenance.

The project's major raw material, which is iron ore, is currently imported from Brazil. It is hoped that when the Itakpe Iron Ore project comes on stream, it would eventually satisfy about 10 per cent of DSC's requirements. The steel plant also utilises limestones which is locally sourced from Mfamosing in Calabar, natural gas supplied from the Ughelli gas fields, Electric Energy from the NEPA grid, and scrap which is also obtained locally. Other raw materials which are mostly imported include electrodes, ferro alloys, and refractories. Iron ore alone constitutes approximately 35 per cent in value terms of the total outlay on raw materials, consumables, and spare parts, while the rest account for the remaining 65 per cent.

The plant has an installed capacity of 1 million metric tonnes of liquid steel which

corresponds to 960,000 tonnes of billets per annum. One third of the billets is utilised by its own rolling mill for the production of reinforcement rods and shapes, while two-thirds are supplied to inland rolling mills at Oshogbo, Jos and Katsina. Other ancilliary products include industrial gases such as oxygen, argon and nitrogen used for various industrial purposes; burnt hydrated lime for water purification and soil stabilisation; and foundry products - various castings and mechanical spare parts for in-house use and for other industrial establishments which request for them.

Some other intermediate products which are marketed include; Direct Reduced Iron (DRI) pellet and cold briquetted products (CBI). These are used by other steel mills or foundries as their raw materials for production of various iron and steel products.

#### D.S.C. BEFORE 1985

A meaningful assessment of the Delta Steel Company Limited before the advent of the Babangida Administration in August, 1985 could be based on the following key parameters:

- (a) Total Turnover;
- (b) Steel Output;
- (c) Import Substitution via Research and Development (R & D);
- (d) Foundry (cast) Production and
- (e) Export Activities etc.;

#### TURNOVER

From 1982 when the Delta Steel Company was commissioned and went into steel production activities, up to 1985 when the Babangida Administration came into being, the company



Engr. Jooji  
conducting the  
Minister of  
Power and  
Steel, AVM  
Nura Imam (rtd)  
during the  
latter's official  
visit to DSC

Pix 4.2

Director-General in the Ministry of Power & Steel, Engr. A. Tukur (centre) being briefed by Engr. Larry Obuareghe during a visit to DSC. Engr. Abe, MD/CE of DSC, left & others look on



Pix 4.3

maintained modest rise in its annual turnover. For example, from N11,950 million total turnover recorded in the start-up year (1982), it rose to N20.12 million in 1983, N57.809 million in 1984 and then climaxed at N88.152 million in 1985. For the purpose of clarity, turnover represents the net value of goods invoiced to customers during the year.

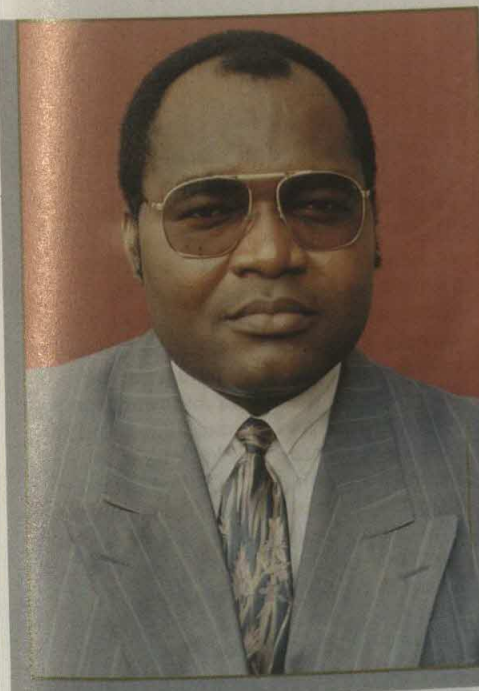
**Steel Output**

In the same vein, annual steel production output maintained an upward swing during the pre-



Pellet Plant, DSC

Pix 4.4



Pix 4.5

Engr. A. T. Abe  
MD/CE, DSC

Engr. Abiodun Titus Abe, was born in 1949. He attended University of Wales, University College of Swansea from 1970-1973., where he obtained B.Sc (Hons.) in Extractive Metallurgy. Engr. Abe who is a Chartered Engineer with the British Council of Engineering Institutions, London, worked with Markeri Tin Smelting Company, Jos, as Engineering Metallurgist. He joined Delta Steel Company in 1980 as an Assistant Chief Engineer in the Raw Materials Planning Department. In 1981, he became Manager (Direct Reduction Plant) and was promoted Assistant General Manager (Direct Reduction Plant) in July 1982. In 1984 he was made an Assistant General Manager (Steel Making), this position he held until 1985 when he was made Acting Deputy General Manager, Steel Production. He was confirmed a Deputy General Manager in 1986. Engr. Abe later became the Deputy General Manager, Commercial, a position he held until September 7, 1990, when he got his new posting.

Babangida era. For instance, liquid steel production rose from 90,270 metric tonnes in 1982 to 181,957 tonnes in 1983 and then 236,091 tonnes in 1985. The annual increases in liquid steel production also translated into higher output of the main stream products namely billets and rolled products. Annual billet production increased from 81,147 tonnes in 1982 to 162,741 tonnes in 1983 and 232,007 tonnes in 1985. Rolled product tonnage equally rose from 12,809 in 1982 to 68,563 in 1984 and 77,947 tonnes in 1985.

**Import Substitution/Research and Development**

The Delta Steel Company, right from inception, recognised the national aspiration towards substituting local raw materials for imported inputs through Research and Development efforts. This has the dual advantages of reducing cost of imports and increasing the local value-added of our products. Among the major breakthroughs in import substitution/research and development programme was the substitution of cotton seed oil for the hitherto imported Rumanol extrude oil during the pre-Babangida period. Over the years, more R&D efforts have yielded fruitful results.

**Foundry (Cast) Production**

Closely related to our research and development efforts is the production of cast iron products in the company's in-house foundry shop to meet part of the spare parts requirement of the



Chief Fred A. Brume  
Pioneer GM/CE, DSC

Pix 4.6

Chief Fred A. Brume was born at Egini, Delta State on September 25, 1942. He attended Government College, Ughelli, 1955-1962. University of Maine, Orono, U.S.A., 1962-1965 and Massachusetts Institute of Technology, U.S.A. He obtained the degrees of Bachelor of Science, Chemical Engineering and Master of Science, Industrial Management. Chief Brume worked in different capacities in Nigeria and abroad including a two year service at the World Bank as an Investment Officer (1967-1969), Head of Projects Promotions and Development, the Nigerian Industrial Development Bank, Controller of Investment Supervision, Nigerian Bank for Commerce and Industry, Secretary and Head of Secretariat, the Nigerian Enterprises Promotion Board and Special Projects Co-ordinator, Federal Ministry of Industries. He was appointed Project Co-ordinator for the Delta Steel Company in October, 1978 and in March 1980 became its first substantive General Manager/Chief Executive.

company. Foundry production by the company is of significant importance in view of the fact that over 80 per cent of the company's spare parts requirement are imported. Some of the cast products from the Delta Steel Foundry Shop since inception include crusher balls and crusher hammers, pulleys and brake drums.

It is worthy of note that the Delta Steel Company also achieved annual increases in the production of foundry products before the advent of the Babangida Administration. With a modest output of 141 tonnes in 1982 and 271 tonnes in 1984, the company recorded an impressive output level of 828 tonnes in 1985.

**Export Production**

Prior to the Babangida Administration, the Delta Steel Company nurtured a corporate ambition to venture into export marketing of some of its products viz: billets, rolled products and other by-products like Direct Reduced Iron (DRI), Cold Briquetted Iron (CBI), lime, gases

etc. in the years ahead.

However, despite the fact that this dream did not come true in the pre-Babangida era, the company sustained its efforts in this direction.



Engr. Tachia Jooji  
GM/CE, (1986-1990)

Pix 4.7

Engineer Tachia Jooji, was born on August 27, 1946 in Tse-Andyar, Benue State. He attended Titcombe College, Egbe, Kwara State 1960-1966 and studied Mechanical Engineering at the Ahmadu Bello University (ABU) where he obtained a Bachelor's degree in 1970.

He started his career at Gold and Metal Mines of Nigeria Limited, Jos. From there he moved to the then Benue-Plateau State civil service, where he was Mechanical Engineer Grade II.

He went to the United Kingdom on the Technical Assistance Programme where he trained in different aspects of engineering and senior management. He was appointed the Acting Chief Mechanical Engineer of the Gold and Metal Mines of Nigeria Limited in April, 1980.

Engineer Jooji joined the Delta Steel Company as Deputy General Manager (Technical Services) in May 1980. In 1982, he became Deputy General Manager (Production), a position he held until 1984, when he became the Acting General Manager. He was confirmed General Manager and Chief Executive in January 1986. Engineer Tachia Jooji is a member of COREN, and a Fellow of the Nigerian Society of Engineers, Nigerian Metallurgical Society, and Association of Business Executives of the United States of America.



Mr. F.E Okorefe  
D.G.M. (Finance) DSC

Pix 4.8

DSC, 1985-1992

The ascension of the Babangida Administration on August 27, 1985, marked a significant turning point in the political and economic history of the country, Nigeria. The regime was and is still characterised by radical changes in the economic life of the nation.

In less than a year in office, the most comprehensive and far-reaching package of economic reforms ever known, was instituted to revamp the ailing Nigerian economy and set it on the path of economic emancipation and national self reliance in an increasingly competitive and protectionist global economic environment. This is the Structural Adjustment Programme (SAP), which embodies a series of economic policy reforms such as:



Dr. S.A. Adalakun  
Executive Director  
(Production) DSC

Pix 4.9



Pix 4.10

Electronic Data Processing Sector, DSC

- The devaluation of the naira through the market forces of supply and demand within the framework of the Second-tier Foreign Exchange Market (SFEM);
- Liberalised foreign trade;
- Non-oil export promotion via incentives;
- Deregulation of most sectors of the economy particularly the banking and finance sector;
- Review of import tariff system, and
- Privatization and Commercialization of some public enterprises.

All these economic policy reforms brought Delta Steel Company, into a new and overhauled economic environment. These could be seen in the parameters below:

**Turnover**

The Delta Steel Company annual turnover since 1985 grew in leaps and bounds to the satisfaction of all and sundry.

However, in 1986, the year of radical economic changes, the company's turnover dipped to N72.826 million, ostensibly due to the time lag required to adjust to the emerging realities in the business scene. Then, having adjusted to the new dispensation, the Delta Steel Company began to record monumental increases in annual turnover. From a meagre N72.8 million in 1986, it shot up to N118.163 million in 1987 and up again to N207.333 million in 1988. In fact, 1989 was not an exception either. The volume of business transactions handled by the company in 1989 amounted to N443.074 million, while in 1990 the value climbed to N502.38 million. These impressive figures are, no doubt, attributable to the new business climate occasioned by the Structural Adjustment Programme (SAP) and the associated devaluation of the Naira exchange rate.

**Steel Output**

However, in terms of absolute value of steel produced annually since 1985, the story is slightly different. In 1986, liquid steel produced dropped to 134,067 tonnes from a record level of 236,091 tonnes in 1985. Most unfortunately, steel output levels in subsequent years up to 1991 remained below the 1985 record.

The major explanations for this lack-lustre performance are largely operational. With the ageing of the plants and other production equipment coupled with the epileptic nature of electricity supply, frequent equipment breakdowns have had to take its toll on steel production output.

**Import Substitution/Research and Development**

In the area of Research and Development programme which is a vehicle for import substitution strategy, the Delta Steel Company has sweet stories to tell. With serious emphasis on the use of local raw materials in industries since 1985, the Delta Steel Company intensified its efforts in Research and Development programmes.

As a result, more successful breakthroughs have been recorded. The major ones are as follows:

- Development of local cotton seed oil to replace imported Rumanol oil;
- Development of local ilemnite sand to replace imported chromite sand;
- Elimination of imported scrap by boosting local supply;
- Development of fettling mass for hot furnace repairs from used MgO bricks;
- Development of Laddle turndish covering compound from local materials that include rice husks, slag and used bricks;
- Completion of pilot tests and investigation into the suitability of Itakpe Iron Ore concentrates for use in the Pellet Plant;
- Other on-going collaborative research programmes with some Nigerian Universities and other local research institutions.

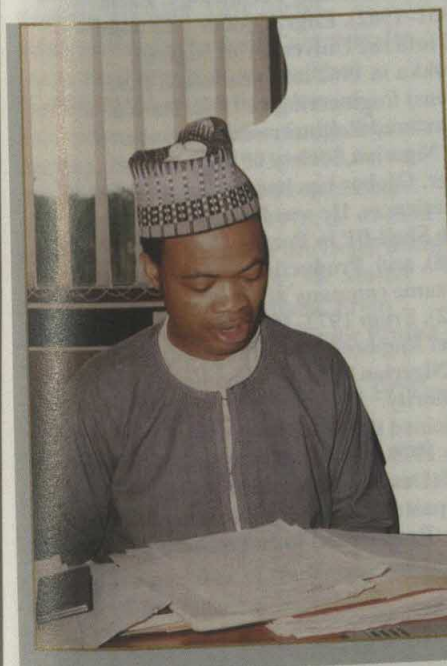
**Foundry Production**

Since 1985, foundry production activities received a boost at the Delta Steel Company Foundry Shop. Following the rejuvenation of government policy on import substitution, local demand for DSC's foundry products increased. This in turn, increased the tempo of foundry production in the company to meet the ever increasing demand. Thus, the company's annual output of foundry products between 1985 and 1991 has remained at about 650 tonnes on the average, compared with the pre-1985 era. Some of the major consumers of the company's cast products include the Peugeot Automobile of Nigeria (PAN) which uses brake drums and brake disc from the Delta Steel Foundry Shop.

Other consumers are Cement Manufacturing Companies and Quarrying Companies which use crusher balls and jaws and crusher hammers from the foundry.

**Export Production**

With the numerous incentives put in place in 1986 to promote non-oil exports and enhance national self-reliance, the Delta Steel Company broke into the export market in 1986 when 4,160



Mr. L.A. Momoh  
DGM (Commercial)

Pix 4.11

Mr. L.A. Momoh, was born on September 12, 1946 at Agbede in Etsako Local Government Area of Edo State. He attended Afenmai Anglican Grammar School, Igarra, (1959-1964) Igbobi College, Yaba (1965-1966). He proceeded to the University of Lagos in 1967 and graduated B.Sc (Hons) Degree in Business Administration in 1970. Before joining Delta Steel Company, Mr. Momoh had been exposed to varied working experiences. He was an Economic Research Assistant with the Ford Foundation in Lagos. He later became Investment Analyst with the Nigerian Industrial Development Bank (NIDB), Lagos, (1972-1974). He was also the Chief of Banking Operations in the Nigerian Bank for Commerce and Industry in 1974-1980. Mr. Momoh joined the Delta Steel Company as Assistant General Manager in charge of the Commercial Division and was later promoted Deputy General Manager.



Dr. Matthew Kotu Aiyewa  
Executive Director (Commercial)

Pix 4.12

Dr. Matthew Kotu Aiyewa was born at Obehira - Okene on October 5, 1948. He hails from Ososo in Etsako Local Government Area of Edo State. Dr. Aiyewa attended Government Secondary School, Okene, from 1962-1966. He obtained a B. Sc (Hons) Electronics and Electrical Engineering from the University of Manchester, Manchester, England in 1972, and his Ph.D (Electrical Engineering) in 1976. He took up appointment as a Lecturer Grade I with the University of Benin, Benin City. He left the University to take up appointment with the Delta Steel Company Limited, Ovwian-Aladja, in January, 1980, as an Assistant Chief Engineer (Instrumentation and Control) and rose to the rank of Co-ordinator (Engineering Services Division) in September, 1990. And in December, 1990 he was appointed as Executive Director (Commercial).



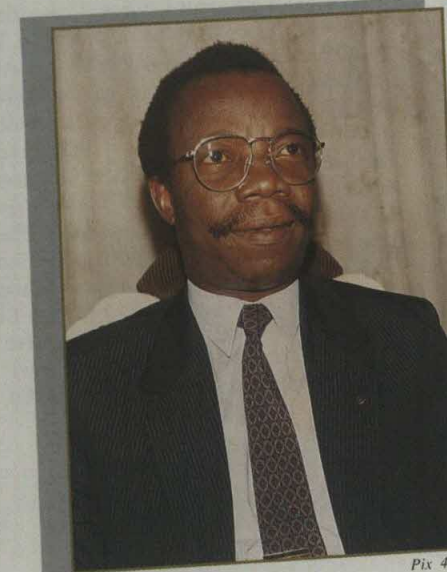


Engr. S.N. Ojobor  
DGM (Production)

Pix 4.13

Engr. S.N. Ojobor was born on March 12, 1940 at Nsukka in Enugu State. He attended Trinity High School, Oguta (1955-1960) and the Nigerian College of Arts, Science and Technology, Zaria (1961-1962). Engr. Ojobor was admitted into the University of Nigeria, Nsukka in 1962 and graduated B.Sc (Hons) Engineering in 1966. He is a Chartered Engineer and a member of the Nigerian Society of Engineers. Engr. Ojobor has had varied working experiences. He was Project Engineer with Shell-BP in Port Harcourt (1967-1968), and Production Supervisor with the same company at Warri (1970-1972). From 1972-1979, he was the Chief Engineer, Project Planning with the Nigerian Steel Development Authority. He joined the Delta Steel Company in May 1979 as Assistant General Manager (Construction and Erection). He was promoted Deputy General Manager (Production) in November, 1980.

Dr. Donatus Uko, was born in 1947. He attended University of Southampton, England (1971) and Mc Master University, Hamilton, Canada (1975-1978). Before joining Delta Steel Company, Dr. Uko worked briefly as an Assistant Scientific Officer with Marchwood Engineering Laboratories, Southampton, England, 1971. From 1971- 1973, he was with Shell BP, Lagos as a Project Engineer. Between 1974 and 1978, he worked as a Teaching Assistant in the Department of Mechanical Engineering, Mc Master University, Hamilton, Canada. From 1978-1979, he worked as a Senior Project Engineer with NNPC, Lagos. He joined Delta Steel Company in 1979 as an Assistant Chief Engineer (Raw Materials Planning) and rose to the rank of Deputy General Manager (Commercial) in 1984 and in 1988, he was moved to the Iron Making Division. Dr. Uko is a member of the Council of Registered Engineers of Nigeria (COREN).



Dr. Donatus K. Uko  
Deputy General Manager (Iron Making)

Pix 4.17

Mr. M.O. Adiotomre, was born at Ovu-Inland in Ethiope Local Government Area of Delta State on June 1, 1940. He attended University of Ibadan and graduated with B.Sc (Hons) degree in Geography in 1970 and obtained a diploma in Public Management at the University of Aston Management Centre in 1975.

Mr. Adiotomre has been exposed to varied working experiences. He was an Administrative Officer with the Bendel State Health Management Board from September, 1971 to February, 1978. From March, 1978 to October, 1979, he was the Acting Executive Secretary of the Board. He joined the Delta Steel Company in 1979 as Assistant General Manager (Administration). He was later promoted Deputy General Manager (Administration).

Mr. Adiotomre is a member of the British Institute of Management and the Institute of Works Managers.



Mr. M.O. Adiotomre  
Deputy General Manager (Administration)

Pix 4.16



Alhaji Umaru Azores Sulaiman  
Executive Director - (Management Services)

Pix 4.18

Alhaji U.A. Sulaiman was born in 1946 and attended the Ahmadu Bello University, Zaria, from where he obtained a Bachelor of Science (Honours) Degree in Chemistry in 1970. He also holds a certificate in Human Resources Development from USDA, Washington, USA in 1989. He has a very wide and varied working experience spanning the cement, petroleum, pharmaceutical, fertilizer, banking and steel industries apart from the State and Federal Civil Service and their agencies. A one time Special Assistant to the President on Statutory Boards, Alhaji Sulaiman joined the services of the Delta Steel Company Limited in 1980 as Deputy General Manager (Administration) and was later appointed Executive Director (Management Services).



Pix 4.19

Engr. (Dr.) Edward Ugochukwu Chukukere  
Executive Director – Technical Services

Dr. E.U. Chukukere was born on November 23, 1935, at Owerri-Nkwoji, Imo State. He attended Government College, Umuahia, from 1947 to 1952, Technical Institute, Yaba, from 1953 to 1954 from where he moved to University College, Ibadan, leaving there later for the Kumasi College of Technology in 1956 and later obtained a B.Sc Degree in Engineering at the University of Glasgow, Royal College of Science and Technology. He obtained a Master of Science and Ph., D from the University of Toronto in 1963 and 1966, respectively. He was General Manager/ Chief Executive, Niger Steel Company Ltd, Enugu before being appointed Executive Director, Technical Services, Delta Steel Company Limited on September 7, 1990.

Engr. E.T. Obodo, was born in 1938. He attended Huddersfield Polytechnic and Granfield Institute of Technology where he obtained his M.Sc. Degree in Production Engineering.

A Chartered Engineer and member of NSE, Engr. Obodo has had varied working experiences at home and abroad.

He joined the Delta Steel Company in 1981 as an Assistant General Manager (Rolling Mill). In April 1984 he was moved to Material Preparation, and later to Project Engineering and Design in May, 1985. He was appointed Acting Deputy General Manager (Administration) in July, 1985, until March, 1987. In 1986, he was made substantive Deputy General Manager (Estate Services) a post which he combined with his duty as the Acting Deputy General Manager (Administration) until a new Deputy General Manager (Administration) was appointed in 1987.



Pix 4.20

Engr. Edward Toriste Obodo  
DGM (Estate Services)

tonnes of Direct Reduced Iron (DRI) was first shipped to Britain. Similarly, other by-products namely Cold Briquetted Iron (CBI) and broken graphic electrode were successfully exported in subsequent years to earn foreign exchange for the country.

### DSC, 1989-1992

Perhaps the appointment of A.V.M. Nura Imam (Rtd) as the Minister of Mines, Power and Steel in 1989 came timely; especially as it coincided with the height of disillusionment of the management of government steel mills on the one hand, who saw their dreams of achieving completed steel projects on schedule, or realising installed production capacities crash with the advent of SAP; and the Nigerian populace on the other, who became disappointed as their hopes of industrialization and technological self reliance promised by the establishment of local steel mills seemed more like a mirage. This atmosphere of pessimism was further reinforced by international organizations, pressurising government to abandon further pursuit of steel development projects in line with the demands of SAP.

With valor and vision, A.V.M. Nura Imam (Rtd) stormed the scene with unprecedented dynamism and decisiveness that had never been witnessed in the annals of the Nigerian steel industry. He successfully convinced government of the need to make functional and viable the existing companies by injecting more funds as working capital to which Delta steel company benefitted to the tune of N70 million - the first ever working capital granted the company since inception in 1982. He is also a forefront advocate of the commercialization and privatization exercise currently sweeping through the government owned steel companies. He reawakened government interest on the need to dredge the Escravos channel and provide the company with a captive power plant, which are vital for optimum performance of the Delta Steel Company.

Realising that all his efforts to set DSC on the rail of progress would come to nought if the management culture of the company is not re-oriented to become cost conscious and result oriented, A.V.M. Imam (Rtd) infused fresh blood and re-vitalised the management of the company for more effectiveness. He championed the appointment of a crack team of Board of Directors for DSC in April, 1991, under the able chairmanship of Chief Rufus F. Giwa and is a resource person in the subsisting German/Austrian loan for the refurbishing of the company's ageing equipment. More still, he was instrumental to the approval by government for capital restructuring including the conversion of existing loans to equity and revaluation of Delta Steel Company's assets so as to strengthen its balance sheet to enable financial assistance.

A.V.M. Imam (Rtd) has also succeeded in reversing the opinion of the World Bank and subsequently mustered their support for further development of the steel projects in Nigeria. The concept and subsequent award of the Ajaokuta - Aladja rail line to facilitate the movement of bulk goods and materials most vital to the sustenance of the steel companies in viable operation remains the brain child of A.V.M. Imam.

Undoubtedly, A.V.M Imam's tenure as the Minister of Mines, Power and Steel has been

**Table 4.1**  
**SUMMARY OF CUMULATIVE PRODUCTION (T) 1982 TO 1991**

Rolled Product	Billets		Liquid Steel	D.R.I.			Oxide Pellets		Burnt Lime		Cast Products
	1983	1984		1985	1986	1987	1988	1989	1990	1991	
1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	TOTAL	
12,809	36,297	68,563	77,947	66,943	53,762	58,263	49,030	55,534	28,076	507,224	
81,147	162,741	161,630	232,007	125,621	130,386	132,935	122,312	133,837	108,790	1,391,406	
90,270	181,957	180,318	236,091	134,067	136,552	139,326	127,468	138,949	113,801	1,478,799	
73,297	155,926	142,354	242,242	108,638	130,863	131,771	123,339	112,145	107,847	1,328,416	
162,434	186,984	219,635	269,695	150,635	164,493	175,143	176,936	165,316	123,918	1,795,189	
11,186	15,322	15,475	20,520	12,520	13,398	13,680	16,200	18,685	15,727	152,291	
141	165	271	828	627	650	709	667	608	697	5,363	

**Table 4.2**  
**D.S.C. SALES PERFORMANCE FOR 1990**

PRODUCTS	SALES VALUE			SALES VOLUME		
	1990 SALES Nm		OUTSTANDING PAYMENT (Nm)	PRODUCTS	DESCRIPTION	QUANTITY
	TOTAL SALES	ACTUAL CASH RECEIPTS				
BILLETS	210.294	198.691*	50.996	BILLETS	DISTRIBUTION	18,093
ROLLED PRODUCTS	219.767**	151.585	12.117	(TONNES)	K.S.R.C.	20,609
GASES	2.985	2.129	0.473		J.S.R.C.	15,023
FOUNDRY	0.823	0.720			O.S.R.C.	4,495
MACHINE PARTS	0.040	0.036	0.020		OTHERS	58,221
LIME	2.930	2.967	0.411		TOTAL	
CROP ENDS	3.066	3.066			PROFILES	
MISCELLANEOUS	1.583	1.582	0.073		PLAIN ROUNDS	12,046
TOTAL	441.488	360.776	0.090		RIBBED BARS	36,672
					EQUAL ANGLES	2,276
					FLAT BARS	1,699
					DOWNGRADES	1,127
					TOTAL	53,820
					OXYGEN	1,199,426
					NITROGEN	30,617
					ARGON	15,690
					TOTAL	1,245,733

NOTE: \* THE TOTAL RECEIPTS INCLUDE N53.611 MILLION FROM PRE-1990 SALES.

\*\* THE ROLLED PRODUCTS SALES INCLUDE THE PRODUCTS USED FOR DEBT SETTLEMENT.

**Table 4.3**  
**SUMMARY OF PRODUCTION ACHIEVEMENT IN 1990 D.S.C.**

PRODUCT	PLAN	ACTUAL (MP)	% ACHIEVED	MAJOR PROBLEMS
ROLLED PRODUCTS	84000	55534	66%	FREQUENT BREAKDOWN OF EQUIPMENT IN THE MILL REDUCED PRODUCTION OUTPUT.
BILLETS	336000	133837	40%	INADEQUATE AVAILABILITY OF SPARES & CONSUMABLES ESPECIALLY REFRACTORIES, FERRO-ALLOYS AND TUNDISH BOARDS
LIQUID STEEL	352800	138949	39%	STOCK OUT OF DRI
DIRECT REDUCED IRON	430460	112145	26%	INSUFFICIENT STOCK OF OXIDE PELLETS. REFRAC TORY PROBLEMS ON THE REFORMER.
OXIDE PELLETS EQUIP-	684220	165316	24%	OVER 60% OF AVAILABLE TIME WAS LOST DUE TO BREAKDOWN ESPECIALLY IN THE INDURATING MACHINE, CHANGING OF WORN OUT PROCESS BELTS ETC.
BURNT LIME DUE	43100	18685	43%	MOST OF THE TIME ON HOLD-ON STORAGE SPACE TO CONSUMPTION. LOW STOCK OF LIMESTONE FROM CALABAR.
HYDRATED LIME	25860	10920	42%	REFRACTORY PROBLEMS ON THE KILN.
CAST PRODUCTS	803	608	76%	FACULTY VOLTAGE TRANSFORMER. REFRACTORY PROBLEMS. FURNACE RELINNING.

**Table 4.4**  
**MAJOR MATERIALS & UTILITIES CONSUMPTION**

MATERIALS	CONSUMPTION
IRON ORE	197326
SCRAP	50590
LIMESTONE	35794
SiMn 65%	38.53
FeSi 75%	508.70
FeMn 75% ALLOYS	1438.38
UTILITIES	CONSUMPTION
ELECTRICITY	212560 MVII
NATURAL GAS	83,052,298 Nm3

Table 4.5

**DELTA STEEL CO. LTD.  
OVWIAN — ALADJA**

**BUDGET PERFORMANCE REVIEW FOR THE PERIOD JANUARY — DECEMBER, 1990**

ITEM DESCRIPTION	ACTUAL 1990 TOTAL (N)	1990 BUDGET (N)	VARIANCE (N)
<b>REVENUE</b>			
BILLETS	200,813,734	973,240,000	772,426,266 A
ROLLED PRODUCTS	250,235,283	411,600,000	161,364,717 A
ANCILLARY PRODUCTS	11,172,681	100,918,600	89,745,919 A
NON-OPERATING REVENUE	19,294,391	6,000,000	4,294,391 A
FG WORKING CAPITAL/GRANT	44,076,698	45,500.00	1,423,302 A
<b>TOTAL REVENUE</b>	<b>516,592,787</b>	<b>1,537,258,600</b>	<b>1,020,665,813 A</b>
<b>EXPENDITURE</b>			
<b>CAPITAL</b>			
PROJECTS	8,395,166	70,020,000	67,624,834 F
FIXED ASSETS	8,254,904	32,855,700	24,500,796 F
<b>TOTAL CAPITAL EXPENDITURE</b>	<b>16,650,070</b>	<b>108,875,700</b>	<b>92,225,630 F</b>
<b>RECURRENT</b>			
PERSONNEL	64,132,873	62,137,871	1,995,002 A
RAW MATERIALS	73,454,134	530,868,400	457,414,266 F
ENERGY	134,135,859	251,401,350	117,265,491 F
CONSUMABLES, SPARE PARTS & REFRACTORIES	105,990,331	528,697,000	422,706,669 F
OTHER OVERHEADS	42,331,787	99,497,124	57,165,337 F
<b>TOTAL RECURRENT GRANT</b>	<b>420,044,984</b>	<b>1,472,601,745</b>	<b>1,052,556,761 F</b>
<b>LOAN</b>			
HOUSING AND MOTOR VEHICLE	1,396,445	4,000,000	2,603,555 F
<b>TOTAL EXPENDITURE</b>	<b>438,091,499</b>	<b>1,585,477,445</b>	<b>1,147,385,946</b>

eventful and productive with a futuristic promise of hope for the nation's steel development pursuits. He has initiated far-reaching policies and projects that today he can proudly lay claim to the trophy of the success story that is the Nigeria steel industry.

### HISTORY

### GROWTH

The Delta Steel Company Limited, Aladja, was established in 1972 as a subsidiary of the Federal Ministry of Power and Steel. It was the first steel plant in Nigeria and the first in Africa to produce steel from iron ore. The plant has since grown to become one of the largest steel producers in the country. It has a capacity to produce 1.5 million tonnes of steel annually. The company has a long and successful history of producing high-quality steel products for the Nigerian market and for export. It has played a significant role in the development of the Nigerian steel industry and has contributed to the growth of the country's economy.

## Chapter 5

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# NATIONAL METALLURGICAL DEVELOPMENT CENTRE, JOS

### HISTORY

National Metallurgical Development Centre, Jos, was one of the entities carved out of the now defunct Nigerian Steel Development Authority (NSDA). It was established in 1972 as the NSDA Materials Testing Laboratory, Jos, but later renamed Metallurgical Research and Test Division with the specific objectives of analysing and up-grading raw materials related to iron and steel production with a view to determining their values and suitability for use in iron and steel production. The analyses and research work centred mainly on iron ores, coal, limestone, dolomite, refractory clays, etc.

The objectives of the National Metallurgical Development Centre, Jos, are to undertake applied research in various branches of metallurgy including testing and beneficiation of minerals, extraction and refining of iron and steel; development of alloys and their heat treatment; fabrication into various shapes by casting as well as other techniques; study of their physical, mechanical and chemical properties; corrosion and surface protection; examination of failures and various other related projects.

The designed functions of the Jos research laboratories lie within the following:

- Upgrading of the qualities of Nigerian ores and materials for the iron and steel production thereby eliminating the importation of such raw materials.
- Improving the performances of the processes used in iron and steel making and of steel products.
- Application of fundamental scientific knowledge to the solution of problems of practical industrial interests in steel production, fabrication and use.
- Providing indigenous skilled know-how in those areas where dependence on foreign assistance had been necessary.

### GROWTH

The research and development activities in the National Metallurgical Development Centre (NMDC) laboratories are being geared up to generate a continuous dialogue between the research, planner, user and industry for the identification of the problems in the background of industrial and national needs. Thus the research and development programmes of the laboratories are drawn up to meet the requirements and stimulate healthy growth and development of mineral, metallurgical and allied industries. The fundamental studies also find a place to assist in the advancement of knowledge as well as the possibility of implementing such findings to fruitful practical applications. The areas of research and development activity embrace the following:

- (i) Development of the beneficiation and agglomeration techniques of indigenous low-grade ores and minerals with a view to an efficient and economic extraction of metals.
- (ii) Conventional and alternative methods of pig iron and steel production utilising substandard grades of raw materials.
- (iii) Continuous evaluation of the processes for the production of sponge iron and its conversion to steel.
- (iv) Development of substitutes of ferrous and non-ferrous alloys with a view to mitigating the absence and shortage of strategic metals like nickel, cobalt, tungsten, chrome and molybdenum.
- (v) Increase the adaptation and use as alloying elements of Nigerian minerals such as columbite, zircon and tantalite in the production of ferro-alloys.
- (vi) Evolving suitable extraction and refining techniques of metals with raw materials from Nigeria.
- (vii) Development of coal carbonisation technology with a view to producing metallurgical coke from indigenous coals.
- (viii) Study on foundry problems in Nigeria relating to foundry moulding materials, improvement on melting operation, and casting techniques.
- (ix) Study on corrosion of metals and alloys and their prevention.
- (x) Development of enamelling and other surface coating on metals and electroplating composition.
- (xi) Development of standard samples for analytical purposes.
- (xii) Study of fundamental aspects of metals and alloys.
- (xiii) Design of pilot flowsheets for various metallurgical processes.
- (xiv) Determination of failure modes in engineering components and structures.

## DEPARTMENTS

At National Metallurgical Development Centre (NMDC), Jos, there are five departments: - Minerals, Metals, Technical Services, Engineering Services and Administrative Departments. The departments and divisions under them are as follow:

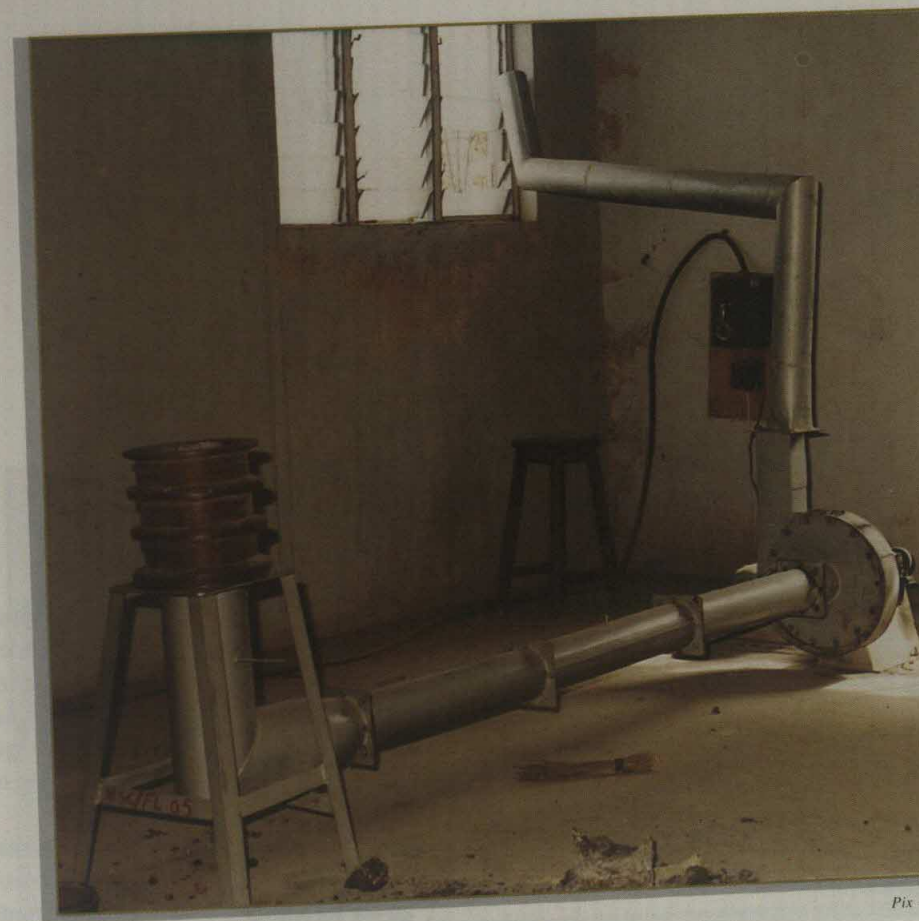
### MINERALS DEPARTMENT

#### (i) Mineral Processing Division

This division is concerned with mineralogical investigations and appraisal of ores, beneficiation of minerals and their agglomeration. The primary objectives of the mineral processing division are to employ scientific and engineering techniques to recover the valuable minerals present on Nigerian shores, by eliminating unwanted materials at the earliest possible stage.

#### (ii) Fuels and Energy Division

This division carries out a continuous evaluation research of the various Nigerian coals for their suitability for the production of metallurgical coke needed in the steel industry. Improvement work is carried out on these coals by way of washability tests, desulphurization



Sinter Gate designed at NMDC

Pix 5.1

Dr. Usman Mohammed Turaki was born 44 years ago in Bida, Niger State. He attended Barewa College, Zaria, and the Leningrad Mining Institute, USSR where he graduated as a Mining Engineer/Geologist and subsequently obtained a M.Sc. degree in Mining Geology. He obtained a Doctorate degree (Ph.D) at the University of Ibadan.

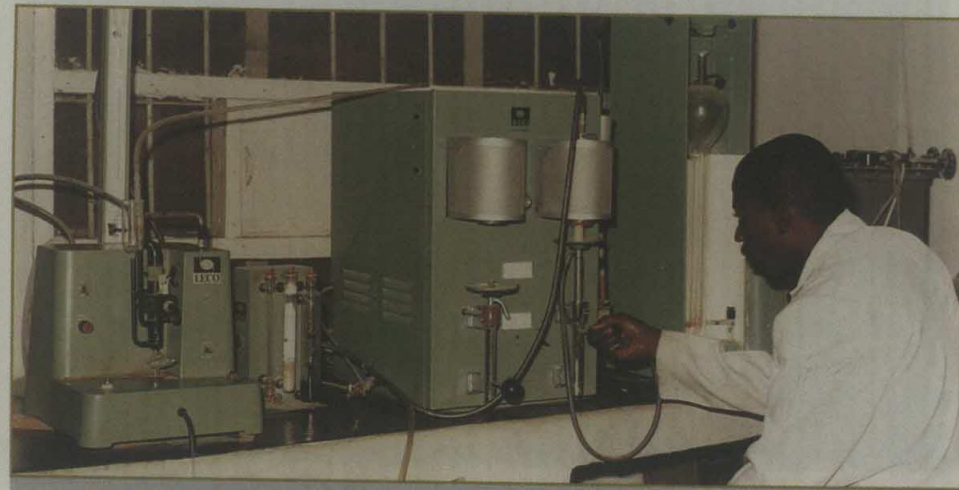
Dr. Usman Turaki's working experience and achievements in mining and related field of Geology include a period between 1974 - 1976 when he was with Shell BP in Lagos as a Petroleum Geologist. He then moved to the Nigerian Mining Corporation in 1976 where he took up appointment as a Senior Geologist, in charge of several NMC's exploration projects. He rose to the position of Assistant General Manager (Exploration) in 1987. He later became the Managing Director/Chief Executive of the Nigerian Mining Corporation.

Dr. Turaki participated in several national and international seminars, technical and top management training courses and has many publications to his credit. He is a Chartered Engineer.



Pix 5.2

Dr. Usman M. Turaki  
Chief Executive, NMDC



Leco Carbon and Sulphur analyst at work

Pix 5.3

prior to carbonization and de-ashing to achieve the production of the valuable metallurgical coke by blending and coking techniques.

**(iii) Refractories Division**

The division is charged with the evaluation of local raw materials for the production of acid, basic and neutral refractories for the metallurgical and allied industries. It undertakes the laboratory and pilot plant studies for the production of these refractories from the indigenous raw materials which include; clays, limestone, dolomite, magnesite, etc. Behaviour of refractories in the furnace, their life and possible improvements are also studied. Routine tests on refractories are also undertaken.

**METAL DEPARTMENT**

**(i) Extractive Metallurgical Division**

This division deals with the development of various technologies for iron and steel making. It also deals with testing of iron ores and blast furnace operations, treatment of direct reduction pellets or pig iron prior to steel making; chemistry of blast furnace slags and reduction processes.

**(ii) Physical Metallurgy Division**

This division deals with metallography, heat treatment and metal physics. In this division there is the metal-working and mechanical testing section. This section's duties include rolling, forging, wire drawing, extrusion, welding and mechanical testing. The section deals with hot and cold deformation processes of metals with or without additional operations like heat treatment, etc.

The testing of metals and alloys includes destructive and non-destructive testing and is rendered as a service to the other sections as well as outside agencies. From such tests, National Metallurgical Development Centre (NMDC) issues test certificates. The section serves on the

membership of the metals testing committee of the Standards Organisation of Nigeria (SON). The heat treatment group deals with the development of optimum heat cycles, the effect of treatment as it affects the properties and structure. The metallurgical failures group work in close co-operation with other departments in investigating the causes of failures of metallurgical components and suggests remedial measures to prevent such failures.

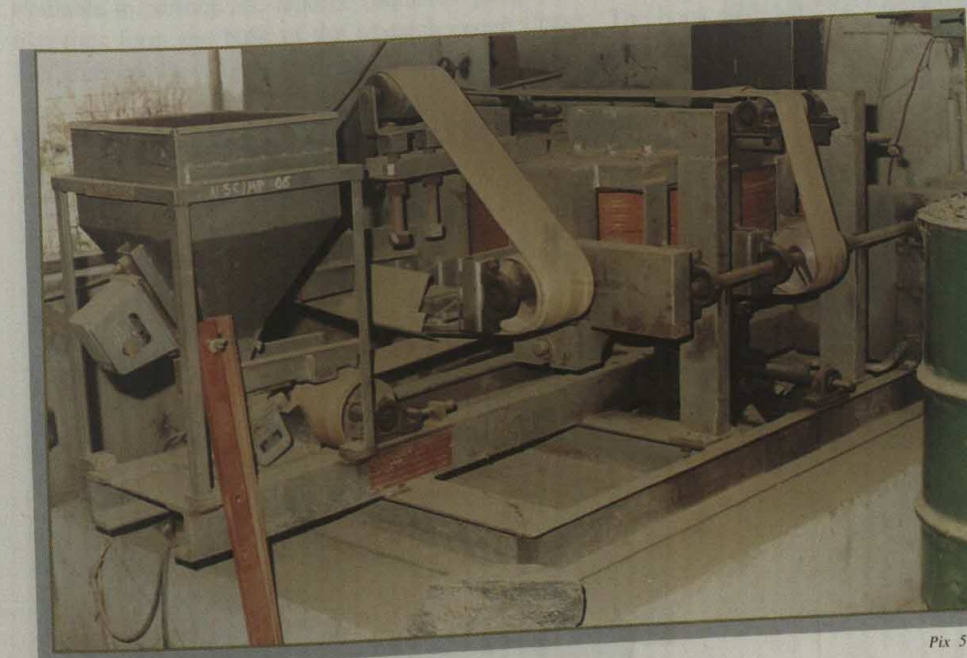
**(iii) Foundries Division**

This division deals with the studies of local raw materials including sands, binders, fluxes, for use in foundries; melting and casting technology, study of casting defects; quality control etc. It also services other departments for the preparation of special melts or castings.

**(iv) Corrosion and Surface Protection Division**

The corrosion section undertakes studies on atmospheric, marine and chemical corrosion both at room temperatures and elevated temperatures, survey of corrosion in different regions in Nigeria and examination of metallurgical failures due to corrosion.

The surface protection section studies and develops the different protection methods to combat corrosion. The function also includes research and development in metal finishing processes, viz; electroplating, enamelling, galvanising, etc.



High intensity magnetic separation plant

Pix 5.4

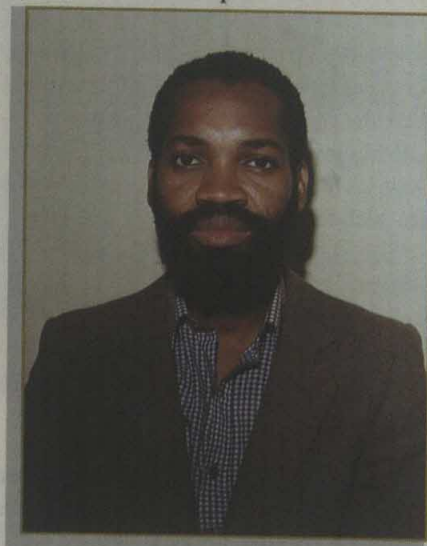
## MANAGEMENT STAFF OF NMDC, JOS



Alhaji A.M. Tukur  
Deputy Director (Admin)

Pix 5.5

Dr. G.G.O.O. Uwadiale  
Head, Minerals Dept.



Pix 5.6



Mr. O.O. Olubajo  
Head, Metals Dept.

Pix 5.7

Mr. E.N.C. Ifeka  
Head, Engineering Services Dept.



Pix 5.8

### SCIENTIFIC SERVICES DEPARTMENT

#### (i) Analytical Services Division

The chemical analysis division deals with analysis by wet as well as instrumental methods. The division, besides rendering routine services to various sections at National Metallurgical Development Centre (NMDC), Jos and sister organisations in the Steel Ministry, also undertakes analyses for outside agencies. It is also involved with the preparation of standards for analyses.

#### (ii) Pollution Control Division

The pollution control division monitors environmental pollution by different effluents and carries out studies to control the negative effects.

#### (iii) Computer Centre

The computer centre carries out control and data processing for the various research projects in the establishment. Delicate softwares related to steel development, mining activities as well as mineral reserve calculations are developed and applied. Computer simulation of blast furnace as well as direct reduction is carried out with the purpose of studying the effect of changes in different parameters.

#### (iv) Library Information and Documentation Division

The main function of the library is to retrieve and file information and disseminate it with the least possible delay. The library deals with specific and current information which is mostly available in periodicals, reports, standards, pamphlets and research papers. The non-book materials form the bulk of the research centre library. The book stock of the National Metallurgical Development Centre Library is more than 800 volumes.



Iron Ore Pelletising  
equipment

Pix 5.9



### ENGINEERING SERVICES DEPARTMENT

#### (i) Mechanical Workshop

A mechanical workshop is equipped with lathe, drilling, universal grinding, milling and shaping machines. The workshop with a team of well-trained staff engage in the fabrication of spare parts to support various departments of the establishment and maintain the heavy machinery used in research operations.

#### (ii) Electrical/Instrument Maintenance Workshop

This undertakes the repairs and maintenance of all electrical equipment in the establishment. It also deals with the repairs of various fire instruments, recorders, controllers and other electronic instruments.

#### (iii) Civil Engineering Workshop

This is responsible for the maintenance and repairs of buildings, supply of gas, water, etc. and the maintenance of the pipelines.

#### (iv) Consultancy Services Division

This undertakes the marketing of the Centre's ideas and products, preparation of feasibility studies, preliminary project reports, design of pilot plant and specialised equipment. It is the objective of this department to assume a pivotal role in the transfer of technology from the four walls of the laboratory to the industry.

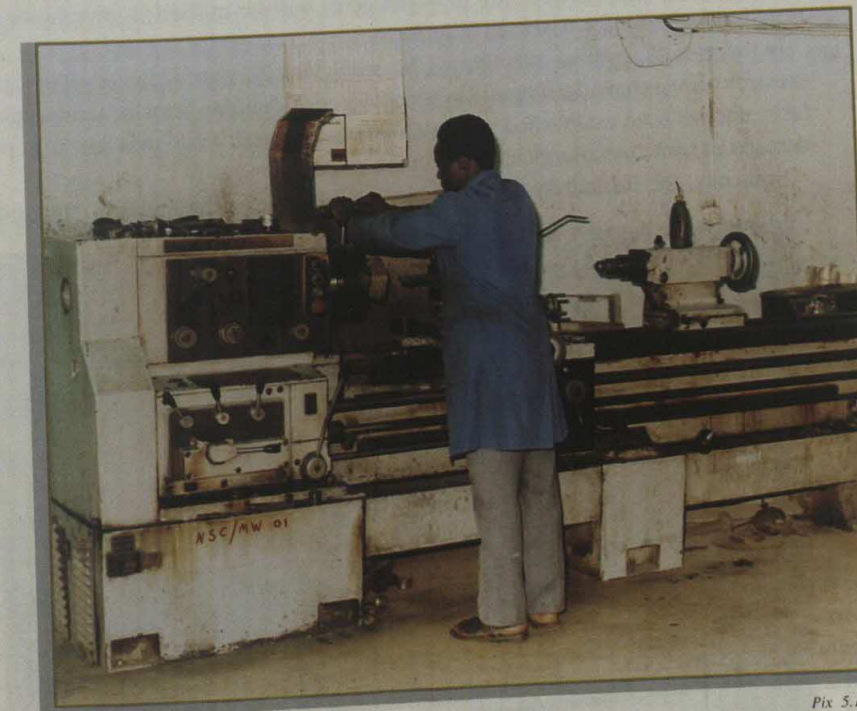
### ADMINISTRATION DEPARTMENT

The main sections of this department are Personnel, Accounts, Audit, Stores, Purchasing and Staff Clinic.

Computer for  
Process Program-  
ming



Pix 5.10



Staff on  
the Lathe  
Machine

Pix 5.11

### SOME MAJOR ACHIEVEMENTS OF NATIONAL METALLURGICAL DEVELOPMENT CENTRE, JOS

As far as the principal raw materials of the iron and steel industry i.e. iron ore are concerned, all the major deposits that have so far been located in the country have been successfully beneficiated and documented by the National Metallurgical Development Centre - Mineral Processing Section.

The deposits include Agbaja, Koton Karfe, Shokoshoko, Tajimi, Ajabanoko, Agbado-Okudu, Toto Muro and of course, Itakpe iron ore deposit, which is currently targeted for use in Ajaokuta Steel Plant.

The minerals department has successfully perfected the process of beneficiating the Itakpe iron ore into super concentrates which met the required specifications of the direct reduction steel plant at Delta Steel Company (DSC). For the first time in the history of Nigerian steel making practice, finished steel products from metallised pellets produced from this superconcentrate were turned out at Delta Steel Company. The metallised pellets have been proved to be of better quality than pellets usually produced from imported concentrates. The Centre has also continued its efforts at upgrading its laboratory scale finding to pilot scale schemes in the production of local inputs such as metallurgical coke, refractory and bricks and iron ore concentrates from other mines. NMDC in cooperation and with a financial assistance from UNDP is erecting a 250kg capacity Coke Oven Pilot Plant. In this process, a sizeable proportion of Nigerian coal (up to 41 per cent) will be utilised in blends for production of metallurgical coke for Ajaokuta blast furnace.

In the area of physical metallurgy, National Metallurgical Development Centre (NMDC) research officers have developed a lubricant for wire-drawing from local raw materials, and this lubricant has been established to be superior to imported analogues and is at present in high demand in some metallurgical plants in the country.

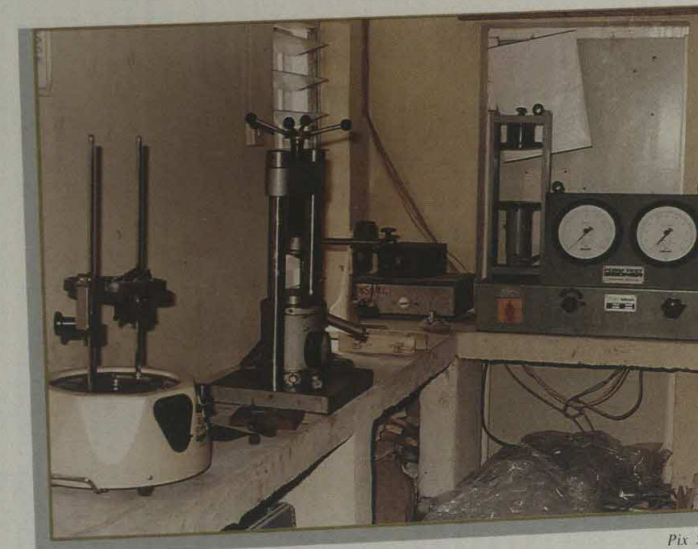
Similarly, the Refractory Division has manufactured suitable high temperature (1400°C)



Philips 550 Scanning Electron Microscope

Pix 5.12

Refractories Laboratory



Pix 5.13

furnace-lining bricks from local materials and has documented data on the major fire clay deposits in Nigeria. These include, Giru, Onibode, Kankara, Kwi, Ogbete, Nkpor, Nsu, Afuze, etc. Studies have also been carried out on the fluxes such as, Jakura and Mfamosing limestone, Osara and Burum dolomite and the results are very promising. The division is currently carrying out studies on the processing of the nation's vast magnesite deposit for production of magnesite refractory bricks to substitute for imports.

The foundry division has carried out detailed characterisation and documentation of the foundry moulding sands available in the country. One of the deposits include zircon sand for steel foundry. Also the foundry has developed a lining mixture for use in the rotary furnace. The division has perfected various casting techniques using locally fabricated tilting furnaces.

#### Finance

Finance is wholly derived from the Federal Government purse by annual/quarterly subvention through the Federal Ministry of Power and Steel. Revenue generation drive is, however, improving, and once the laboratories are fully established, it will be capable of generating some funds for her requirements and save a good amount of foreign exchange since tests and materials development will no longer have to be taken outside the country.

#### Foreign Participation

In the effort to develop and acquire the necessary technology in the iron and steel industry, the assistance of the UNFSSTD/UNIDO in the establishment of the Metallurgical Development Laboratories in Jos was sought. The United Nations Industrial Development Organisation (UNIDO) and her agency have offered tremendous assistance since 1981 through the Federal Ministry of National Planning. The first phase of the project ran from 1981 to 1985 while the second phase is between 1990 and 1993. Through the UNIDO project, equipment and machinery have been acquired and personnel trained, for the first phase of the project.

In the area of personnel training through UNIDO's assistance, many staff of the National Metallurgical Development Centre have received specialised training ranging from four to fifteen months in different parts of the world. The countries where the staff were trained are United Kingdom, USSR, India, Poland, etc. On several occasions, UNIDO experts in various fields had come to the Centre for on the spot training of the staff. Not less than ten of such experts of different nationalities have carried out this exercise within the last four years. The training period of these experts lasted from nine months to one year. These training programmes have resulted in building a solid base for effective indigenous technological development.

Melting Furnace in the Foundry Workshop



Pix 5.14

**TABLE 5.1**  
**LIST OF PAST CHIEF EXECUTIVES**

1)	1972 - 1984	:	Dr. J.C.F. Adigwe
2)	1984 - 1991	:	Dr. W.I.A. Aderonpe
3)	July 1991 - Dec. '91	:	Mr. A.D. Famuboni

In 1988, a new project document was signed between the Federal Government and UNIDO/UNDP for the second phase of the project. The project which took off in 1990 was, in October, 1991 modified to concentrate on the three sub-projects, viz: Metallurgical Coke Pilot Plant, Mineral Beneficiation Pilot and Refractories studies. A lot of inputs have been made in these areas and substantial progress has been recorded.

## Chapter 6

# JOS STEEL ROLLING MILL

## HISTORY

On June 18, 1979, the Federal Government, in its bid to spread industries across the nation, entered into an agreement with a consortium of four German firms to construct the Jos Steel Rolling Mill in Jos.

The consortium comprise Mannesman Demag Metallverformung (managing partner) that designed and built the mechanical/engineering component parts; AEG-Telefunken that supplied and installed all the electrical/electronics parts including the communications system; Ofenbau-Union (OFU) which supplied and built the furnace (80 tonnes/hour capacity) including all its accessories; and Bilfinger + Berger Bau that undertook all civil works.

Jos Steel Rolling Mill was incorporated as a private limited company on January 23, 1981, and its foundation stone was laid on October 30, 1981. Work commenced in earnest and was completed late in 1982. Test production commenced in November, 1982 and the official commissioning was performed on March 26, 1983. Since then, production continued in earnest.

The company is installed with a 210,000 metric tonnes per annum (mt/a) production facilities. These facilities were to be improved upon so as to raise production capacity to 420,000 mt/a in the next phase, and then finally to 720,000 mt/a. These stages, it was envisaged, would be after every five years of commissioning the preceding stage.

## GROWTH

Though it was envisaged that improvement on the facility on ground will be made after every 5 years of the preceding phase, there has been no improvement since the first phase due to poor capacity utilization, the attributes of which are:

- \* Lack of working capital. This is because no analysis was made on the required working capital to finance the operations.
- \* Non-capitalisation of the company - the company's books show only two naira (N2.00) as its paid-up capital.
- \* Down-turn in the construction industry and lack of down-stream industries, sometimes in 1983.
- \* Power failures/fluctuation leading to damages to equipment, replaceable at high cost.
- \* Difficulty in spare-parts procurement from overseas due primarily to high cost of foreign exchange. It is to be noted that the bulk of spare parts requirement are sourced from abroad.

Dr. Sanusi Mohammed was born on September 7, 1948 in Minjibir, Kano State. He was educated at Bolton and Brunell Universities both in the United Kingdom, and holds the Bachelor of Science, Master of Science and Doctor of Philosophy degrees in Metallurgical Engineering. Dr Mohammed commenced his working career with the Nigerian Railway Corporation, and later the Defence Industries Corporation, Kaduna from where he went back to the United Kingdom and taught various aspects of metallurgical engineering at some tertiary institutions including his alma mater, Brunell University. Before his appointment as General Manager/Chief Executive of JSRC, Dr. Mohammed was invited from Britain to serve as a member of the Presidential Task Force to reorganise the management of Ajaokuta Steel and set up new priorities for the giant complex. He was appointed to his present post on September 7, 1990, and assumed duty immediately.



Pix 6.1

Dr. Sanusi A. Mohammed  
General Manager/Chief Executive

### JOS STEEL ROLLING MILL BEFORE 1985

The company was witnessing a steady growth in terms of capacity utilization from about 0.62 per cent in 1982 climaxing at 31.80 per cent in 1985. Since 1985, production witnessed a steady decline to about 5.37 per cent in 1991. Prior to 1987, Jos Steel Rolling Company enjoyed Federal Government grants on quarterly basis. This practice was discontinued and substituted with a "Federal Government Loan". This meagre loan facility is with interest and the company was expected to commence repayment in 1992. The fortunes of the company plummeted and worsened with the introduction of SAP in 1985.

Though it is on record that the government has done quite a lot to reactivate what was seemingly a dormant steel sector, however, the capacity utilization of the Jos Steel Rolling Company has continued to be on the decline due to the general downturn in the economy which has militated against the company's access to much needed raw materials, spare parts and working capital; and above all, high cost of power due particularly to lack of a generating plant at Jos Steel Rolling Company site.

However, with the interest shown by the present administration in the commissioning of the Ajaokuta Steel Plant, the company's source of raw material may be diversified; and it is hoped that with other necessary inputs, the capacity utilisation would likely improve.

Mrs. Larai S. Adjekughele was born 40 years ago. She attended the Institute of Administration, Ahmadu Bello University, Zaria from 1972 - 75, and graduated with a Bachelor of Arts (B.A.) Honours degree in Public Administration. Mrs. Adjekughele has served in various capacities with the Plateau State Water Board where she rose to the post of secretary to the board. In 1980, Mrs. Adjekughele joined the services of Jos Steel Rolling Company as an Assistant Manager (Administration). Three years later she was promoted Manager (Administration) and an Assistant General Manager in 1987. Mrs. Adjekughele is widely travelled.



Pix 6.2

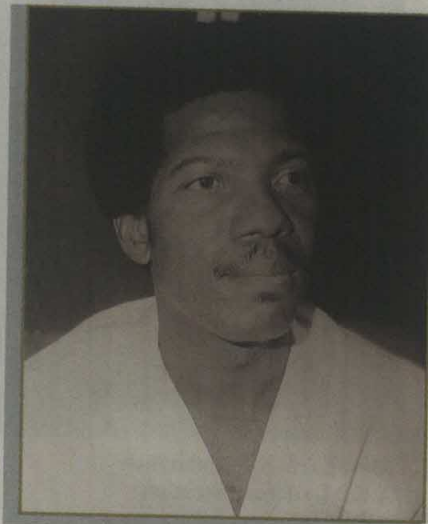
Mrs. Larai S. Adjekughele  
A.G.M. (Administration)

Engr. M. Y. Musa II attended Kaduna Polytechnic from 1969 - 1971 and 1972 - 1974, and Ahmadu Bello University, Zaria (1977 - 1980) where he obtained B.Sc. (Building). He worked briefly in the Northern Regional Government Service where he was deployed to the Ministry of Works in 1967. When the then Benue-Plateau State was created from the Northern Region in 1968, Engineer Mustapha, transferred his services to the new state. In 1974 he joined the Chad-Basin Development Authority (CBDA) during which he attended a technical course in Pakistan. Engineer Mustapha was appointed Principal Technical Officer (Building and Civil Engineering) and later Works Manager at the Plateau State Rural Electrification Board, Jos. In 1981, Engineer Mustapha transferred his services to the Jos Steel Rolling Company as Assistant Manager (Works). He was promoted Manager (Works) and subsequently Assistant General Manager (Technical Services), the post he was redeployed to following the merger of Works and Technical Services Department. Engineer Mustapha Yahuza Musa II, is a member of the Nigerian Society of Engineers (NSE).



Pix 6.3

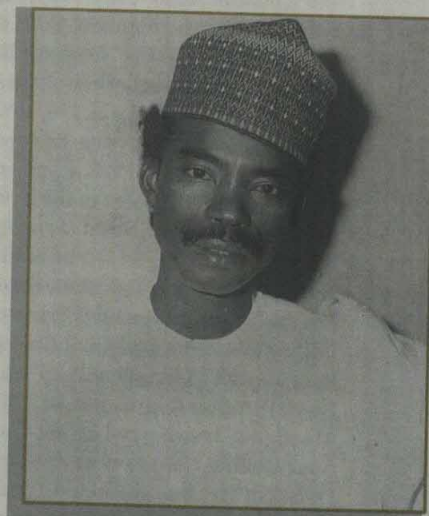
Engr. Mustafa Yahuza Musa II  
A.G.M. (Technical Services)



Mr. Samuel O. Agbo  
(A.G.M Technical Services)

Pix 6.4

Mr. S.O. Agbo attended Kaduna Polytechnic where he graduated with a Higher National Diploma (HND) in Electrical Electronic Engineering in 1972. He has also attended professional courses in Essex Polytechnic in the United Kingdom. He was also a pupil Engineer at the Nigeria Electricity Supply Company (NESCO), Bukuru, Jos from 1972 - 1974; and later Electrical Engineer, Chief Engineer and Services Manager, Benue-Plateau Printing and Publishing Company. Mr. Agbo joined Jos Steel Rolling Company in April, 1992 as Assistant General Manager (Technical Services) from where he was transferred to head the Commercial Department.



Mallam Hamu Aliyu  
Company Secretary/Legal Adviser

Pix 6.5

An Ahmadu Bello University, Zaria trained lawyer, Mallam Hamu Aliyu was called to the bar in 1979. He was a pupil State Counsel, Bauchi State Ministry of Justice in 1979 - 1980; Senior Assistant-Registrar, Federal Polytechnic Bauchi, 1980 - 83, before joining the services of Jos Steel Rolling Company as Company Secretary in 1983.



Mallam Isa Ahmed Bukar  
GM/CE 1985-1990

Pix 6.6

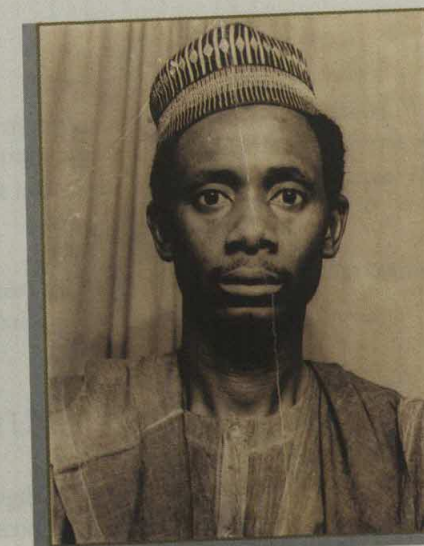
Mallam Isa Bukar graduated in Economics from Ahmadu Bello University in 1971. He has worked in several places including the Plateau State Civil Service. He joined the Jos Steel Rolling Company in 1981 as Commercial Manager. He later rose to the rank of Assistant General Manager (Commercial), a position he held until he was appointed the General Manager and Chief Executive of the Company in 1985. He was transferred to Katsina in 1990.



Mr. Daniel H. Nji  
Manager (Commercial)

Pix 6.7

A pioneer staff of Jos Steel Rolling Company, Mr. D.H Nji was Principal Training Officer, 1981, Assistant Manager (Staff Development and Training), 1983 and Manager (Commercial Department), 1985. He was redeployed to Production Department as Manager in January, 1990. Mr. Nji studied Industrial Technology at Indiana State University, and also holds membership of the Institute of Manufacturing (UK) and Institute of Manufacturing Engineers (USA). He has also attended several professional courses in West Germany.



Abdulahi O. Agabi  
Assistant Manager, Finance

Pix 6.8

Mr. A.O. Agabi is an Accountancy graduate of A.B.U. Zaria. He has worked in several places including Plateau State Housing Corporation as Assistant Accountant, Ministry of Housing and Environment as Accountant, Sub-Treasurer at the Pankshin Sub-Treasury until 1983 when he joined Jos Steel Rolling Company as Senior Accountant. He was Acting Head of Accounts Department 1985 - 87, and currently an Assistant Manager and Acting Head of Finance/Accounts Department. He has attended various courses and seminars.

## Chapter 7

# OSHOGBO STEEL ROLLING COMPANY LIMITED

### HISTORY

Located at some 250km north-east of Lagos, Oshogbo Steel Rolling Company Limited is one of the Federal Government's three inland rolling mills established under the National Steel Council Decree No.60 of 1979 to produce primarily reinforced and general purpose structural steels for construction and downstream wire associated industries.

The "turn-key" project contract for site investigation, construction, machinery and equipment supply, erection, technical training and commissioning of the mill was signed in December, 1979 between the Federal Government of Nigeria and Consortium Steel Rolling - a consortium of four German firms, namely;

- Eisen Bau essence, Gmbh, EBE - the managing member and supplier of ancillary facilities;
  - Schlooman Siemag, AG, SMS - for the supply of mill mechanical equipment including the morgan finishing mill
  - MFB Ferrostal Bau Union, Gmbh - for erection of machinery and supply of steel structures;
  - Strabag Bau AG - for civil construction
- Hayek Engineering AG of Switzerland was appointed as consultant to the Federal Government on the project.

The company was incorporated in January, 1981.

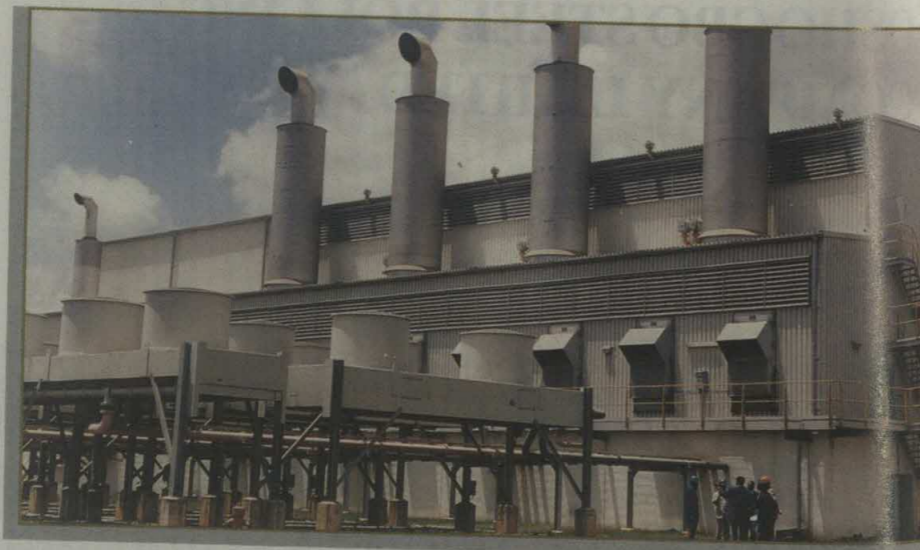
### CAPITAL OUTLAY

At the commissioning time in 1983, the project capital outlay was N123 million. With the commissioning of the captive power plant in 1989 which was executed at a fixed contract sum of N30 million, the total federal government investment in the project now stands at N153 million (pre-FEM).

Presently, the company has an authorised share capital of N30 million of 30,000,000 ordinary shares of N1.00 each with only two shares paid up.

### ORGANISATIONAL STRUCTURE

The company, presently with a staff strength of 703, is organised into six departments of administration, finance, commercial, production, technical services and projects and estate. There is also the office of the General Manager/Chief Executive consisting of Corporate



Oshogbo Steel Company's Captive Power Plant, Commissioned in 1989

Pix 7.1

Services, Company Secretary/Legal Adviser, Internal Audit, Public Relations and Information, Lagos Liaison Office, Medical Centre and Security. The Company has a ten-member Board of Directors.

**Product-Mix**

The mill is a one-strand combined light section and wire rod mill presently designed with a rated capacity of 210,000 tonnes per annum on a two-shift basis. All the same, it has the necessary infrastructural facilities for future expansion to 420,000 tonnes per annum and 720,000 tonnes per annum at second and third phase schemes, respectively.

The mill product-mix consists of:

- Diameter 6mm - 12mm round wire rod
- Diameter 8mm - 12mm ribbed wire rod
- Diameter 12mm - 40mm round bar and
- Diameter 12mm - 25mm rebar

**GROWTH**

So far, Oshogbo steel mill could be said to be fulfilling the Federal Government's objectives of setting it up as reflected in the following areas:

The mill achieved 100 per cent Nigerianisation in all its operations in 1985 barely three years after commissioning.

Apart from providing employment opportunity for 703 Nigerians in various fields and professions, the company has contributed immensely to socio-economic upliftment in its area of establishment as well as enhancing the commercial steel activities of the Nigerian economy.



Engr. Olu Ojo  
General Manager/Chief Executive

Pix 7.2



Alhaji Ahmadu M. Tukur  
Former AGM, Admin.

Pix 7.3



Engr. O.O. Ogunsola  
General Manager/Chief Executive (1984-1985)

Pix 7.4



Mallam Mohammad Ahmad  
AGM, Admin. *Pix 7.5*



Engr. A.B. Kolade *Pix 7.6*  
General Manager/Chief Executive (1985-1988)



Engr. S.A. Feyisetan *Pix 7.7*  
Former Manager, Admin



Mr. B. Falohun *Pix 7.8*  
Former Manager, Commercial



Mr. B.A. Fasoro *Pix 7.9*  
Deputy General Manager, Production



Engr. A. Babatola-Adubi *Pix 7.10*  
Deputy General Manager, Commercial





Engr. Ayo Oguntomi  
Deputy General Manager, Technical Services

Pix 7.11



Engr. Dola Ogunsi,  
Deputy General Manager, Projects and Estates

Pix 7.12



Mr. J.A. Alabi  
Manager, Finance

Pix 7.13



Mr. E.O. Adediwura  
Former Manager, Finance

Pix 7.14

It produces a significant quantity of the nation's steel products requirement (import substitution).

Oshogbo Steel Mill is a major source of raw materials to downstream wire associated industries in the surrounding states. This has, in fact, encouraged several entrepreneurs in establishing more wire and steel related industries as well as giving the hitherto existing ones assurance of regular supply of raw materials locally.

Some of these downstream industries are:

- (i) Ola-Oluwa Aina Wire Industry Limited, Oshogbo
- (ii) Adediran Steel & Wire Industry limited, ASWIL, Ilesa
- (iii) Sanusi Steel Industries Limited, Ibadan
- (iv) Union Steel Industries (Nig.) Limited, Oro
- (v) Eureka Metals Limited, Oshodi - Lagos
- (vi) Nigerian Wire Industries Limited, NIWIL, Ikeja, Lagos
- (vii) Nails & General Steel Manufacturing Industries Limited, Aba
- (viii) Sem-Edo Wire Industries Limited, Benin-City.

For nine years, (1983-1991), the company recorded a cumulative production output of 207,464 tonnes. The breakdown is on Table 7.1

**Table 7.1**  
**PRODUCTION OUTPUT**  
**1982/83-1991**

Year	Output (Tonnes)
1982/83	18,881.63
1984	23,860.50
1985	41,389.70
1986	32,327.10
1987	33,937.00
1988	16,531.73
1989	20,187.41
1990	18,367.10
1991	19,981.67
Total	207,463.84

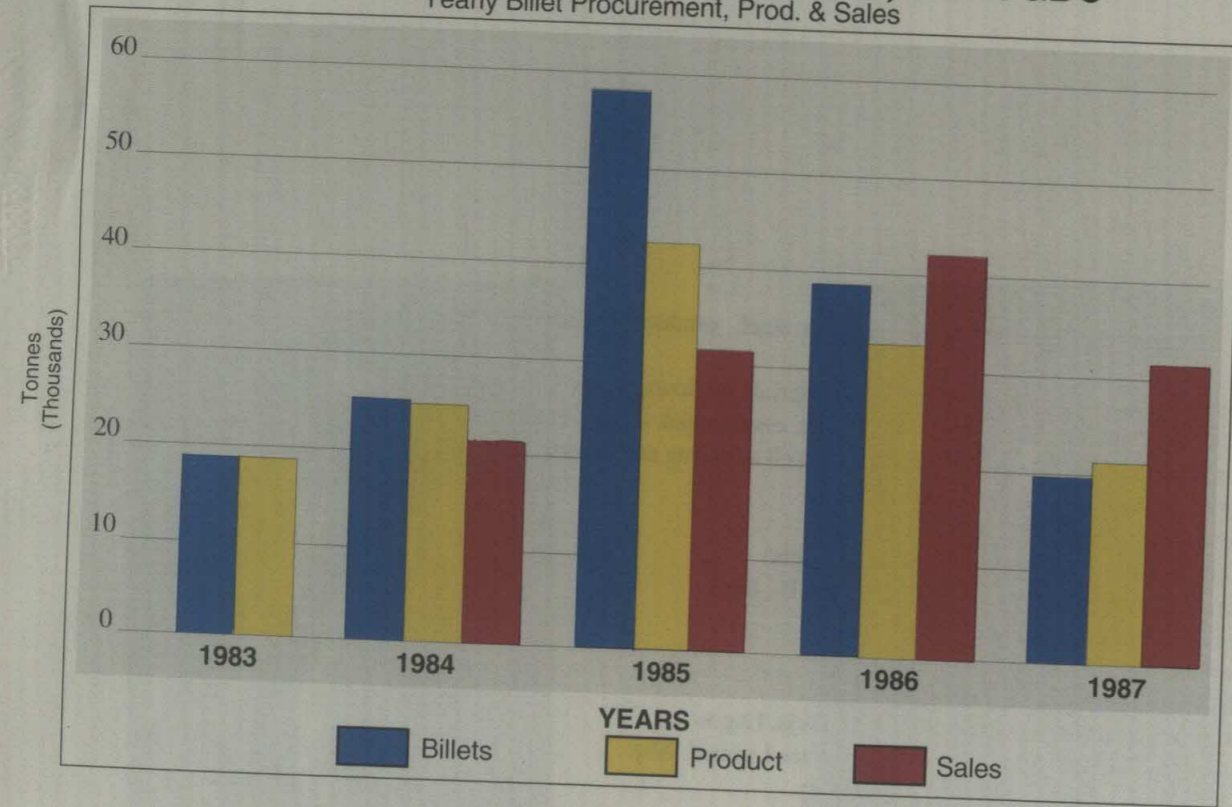
High premium is placed on the quality of the company's products as they are produced in accordance with international standards. In recognition of this, the company was honoured in 1990 for the third year running with Nigerian Industrial Awards (NIS) by the Standard Organisation of Nigeria (SON) for high quality rolled products. The company was also honoured in 1990 with the International African Trophy for Quality by Trade Leader's Club based in Madrid, Spain. This international award, was created for the purpose of rewarding and encouraging firms excelling in quality, image and prestige of their products.

### OSHOGBO STEEL ROLLING COMPANY BEFORE 1985

The company was barely three years old in operation by 1985. The production output rose from 18,882 tonnes in 1982/83, the company's first year of operation, to 23,861 tonnes in 1984. It then rose to a maximum record output of 41,390 tonnes in 1985.

### OSHOGBO STEEL ROLLING CO. LTD, OSHOGBO

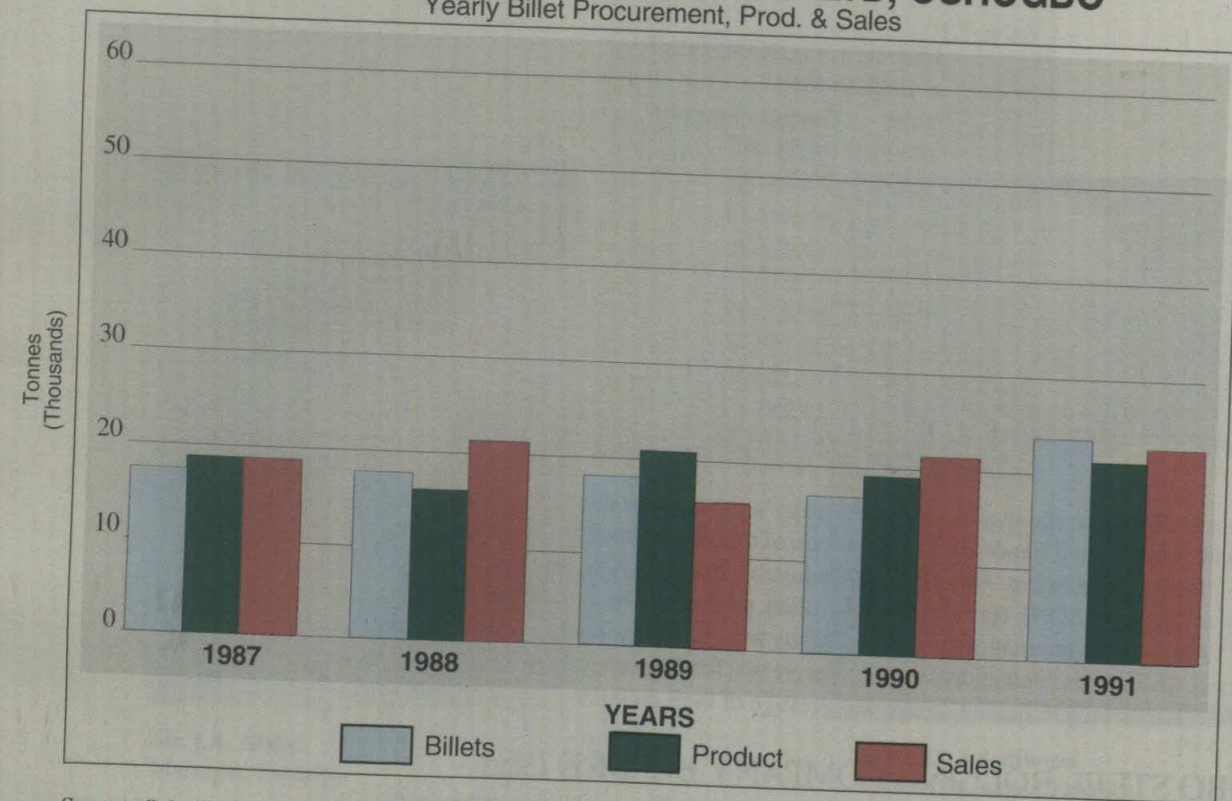
Yearly Billet Procurement, Prod. & Sales



Graph 7.1

### OSHOGBO STEEL ROLLING CO. LTD, OSHOGBO

Yearly Billet Procurement, Prod. & Sales



Source: Oshogbo Steel Rolling Co. Ltd

Graph 7.2

#### THE COMPANY SINCE 1985

Since 1985, the production output has not followed a steady growth rate, rather it has been on a fluctuating trend. In 1986, the output was 32,327 tonnes and rose to 33,937 tonnes in 1987. It nose-dived to a minimum record output of 16,532 tonnes in 1988, but picked up again in 1989 to 20,187 tonnes.

Oshogbo Steel Mill's captive power plant was officially commissioned by the Hon. Minister AVM Nura Imam (Rtd) on June 14, 1989; and since then, the production output has remained fairly constant and close to 20,000 tonnes. In 1990, the output was 18,367 tonnes and rose to 19,982 tons in 1991. The expectation was to achieve a record of 60,000 tonnes in 1992.

## Chapter 8

# KATSINA STEEL ROLLING COMPANY LIMITED

### HISTORY

The contract agreement for the construction of the rolling mill on turn-key basis was signed between the Federal Government of Nigeria and Kobe Steel Limited, Japan in June, 1979. The plant was officially commissioned in December, 1982, though commercial production commenced earlier in September, 1982. The mill was planned to have production capacity of 210,000 tonnes per year based on a specified product-mix of reinforcement bars and wire rods. The capacity was expected to expand to 420,000 tonnes per annum at the second stage, and 720,000 tonnes per annum at the third stage. The major civil structures for second stage expansion were laid along with the first stage to minimize interference with production line while erecting the second stage.

### STAFF DEVELOPMENT AND TRAINING

As transfer of technology is one of the main objectives of the development of the steel industry, effective training arrangements were incorporated in the main contract agreement whereby Messrs Kobe Steel of Japan organised all external training programmes, and effectively participated in most of the local ones. Consequently, all KSRC's engineers and technicians and most of the management staff were trained in Japan. The remaining technical and other members of staff have received in-plant training locally based on budgetary provisions. At present, there are 571 members of staff divided into four departments as follows:

(a) Administration/Finance Department including General Manager's Office	-	178
(b) Maintenance and Technical Services Department	-	207
(c) Production Department	-	165
(d) Commercial Department	-	21
Total		571



Aerial view of Katsina Steel Rolling Company Ltd.

Pix 8.1

Mallam Isa Ahmed Bukar, 44, General Manager/Chief Executive, graduated from the Ahmadu Bello University, Zaria, in 1971 and did further studies in Marketing in Brussels, Business Administration in the University of California, Los Angeles and Industrial Management in Syracuse University, N.Y., U.S.A. Mallam Isa Ahmed Bukar began his working career in 1971 as a Marketing Officer with the Nigeria Livestock and Meat Authority, Kaduna. In 1974 he moved to Nigeria Airways Limited as a Senior Research Officer. He attended a course in Advanced Aviation Marketing Management in Brussels, Belgium. Upon his return, he was promoted to Assistant Commercial Manager, Nigeria Airways Limited. He joined the Plateau State Civil Service in 1987.

Mallam Bukar was invited in 1981, to serve as Commercial Manager of the newly incorporated Jos Steel Rolling Company Limited. He became the Assistant General Manager (Commercial Services) in 1984 and Acting General Manager a year later.

In February, 1986, Mallam Isa Bukar became the substantive General Manager and Chief Executive of the Jos Steel Rolling Company Limited, and in September, 1990, he was appointed the General Manager/Chief Executive of Katsina Steel Rolling Company Limited (KSRC).



Mallam Isa Ahmed Bukar  
General Manager/Chief Executive

Pix 8.2

Engr. Mahmud Kanti Bello, the first General Manager and Chief Executive of Katsina Steel Rolling Company Limited was born in Ingawa in Katsina State. He is a graduate of Ahmadu Bello University, Zaria where he obtained his Bachelor's degree in Civil Engineering in 1972. Engr. M.K. Bello had varied working experience with several establishments. Some of these include: Residence Engineer - Funtua Project (1972), District Engineer, Funtua/Malumfashi Project (1975), Provincial Engineer - Zaria (1978), Progress Engineer - Ministry of Works, Kaduna (1978), Project Manager - Ministry of Education, Kaduna (1978 - 1980). In November, 1980, he was appointed the Project Co-ordinator of Katsina Steel Rolling Company Limited.



Engr. Mahmud Kanti Bello  
Pioneer GM/CE

Pix 8.3

## FACILITIES

### Rolling Mill

The main production facility is the Rolling Mill which is suitable for the production of bars and wire rods of the following dimensions:

Bars	:	10mm - 40mm diameter
Wire-rod	:	5.5mm - 12mm diameter

The production of 10mm bar and 5.5mm diameter wire rods was not in the original product-mix but was locally developed in response to market demand. In fact, production of 10mm and 5.5mm diameters accounted for 85 per cent of the total output in the year 1990.

However, because of the introduction of these two smaller diameters into KSRC's product-mix, its mill production capacity now stands at between 120,000 metric tonnes and 180,000 metric tonnes per annum - an average of 150,000 metric tonnes per annum. The seeming reduction in capacity does not imply reduced income. Indeed, because small diameters fetch higher prices, it may mean higher income for the company if production and sales go on effectively.

### Wire Drawing Plant

In order to satisfy the raw material needs of down stream wire processing industries, a wire drawing plant was constructed and commissioned by Kobe Steel Limited in November, 1984. The plant which produces hard drawn and annealed wire of diameters 1.0 - 5.00mm has an installed capacity of 8,600 tonnes per annum.



Alhaji Hassanu Saleh  
AGM Commercial

Pix 8.4

Alhaji Hassanu Saleh was born on September 6, 1951. He attended Government Secondary School, Katsina and the School of Basic Studies. He obtained a Bachelor of Science in Education (Mathematics) at the Ahmadu Bello University, Zaria in 1978 and Master of Science in Computer, Cranfield Institute of Technology, England in 1984. He started his public service career as a teacher in 1973. Between 1979 and 1988 he was a Lecturer at the Kaduna Polytechnic. He joined the KSRC as a management staff in 1986.



Alhaji Ashiru Abubakar Mani  
DGM, Administration

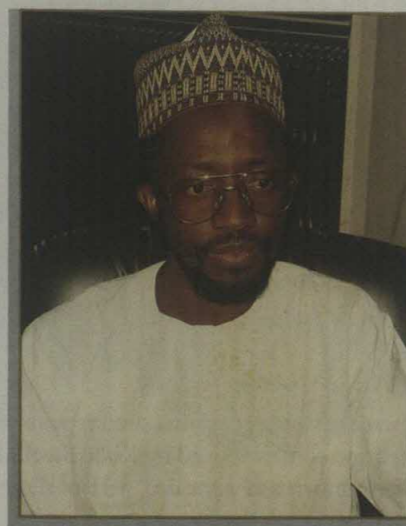
Pix 8.5

Alhaji Ashiru A. Mani was born in Mani, Katsina State on March 15, 1944. He attended Government Secondary School, Katsina (1960-1964) and Government College, Kano (1965-1966). He studied Physics and Chemistry at the Ahmadu Bello University, Zaria, 1967-1971 and obtained the degree of Bachelor of Science (Honours) in 1971. In 1973 he added a Post Graduate Diploma in Education from the same University. Between 1971 and 1980 he served in various capacities with the Ministry of Education, attaining the position of principal in 1977. In 1981 he was appointed Manager, (General Administration) with the Katsina Steel Rolling Company and was promoted Assistant General Manager in 1983, a position he held until 1989 when he was appointed Deputy General Manager. Alhaji Mani has attended management training courses in Japan and France. He was a member of the Constituent Assembly (1988-1989).

Engr. Sanusi Garba was born in Katsina on June 7, 1955. He attended Government College (1968-1972) and College of Arts, Science and Technology, Zaria (1973-1974). He obtained a Bachelor of Engineering (Honours) Degree in Electrical Engineering at the Ahmadu Bello University, Zaria in 1977 and Master of Science, Industrial Management, University of Birmingham, United Kingdom in 1980.

Engr. Garba is a Chartered Engineer and professional member of the Cost Management Accountants. He is a corporate member, Institution of Production Engineers. He attended several professional courses in Japan.

He started his career with the Ministry of Works and Housing, Kaduna as Electrical Engineer II. He worked at the Nigerian Television Authority as Senior Engineer (1979-1981) from where he joined KSRC in 1981 as Principal Engineer (Production). He was promoted Deputy General Manager in 1988.



Engr. Sanusi Garba  
Deputy General Manager (Production)

Pix 8.6



Alhaji Zayyana Ahmed  
Ag. GM (1989-1990)

Pix 8.7

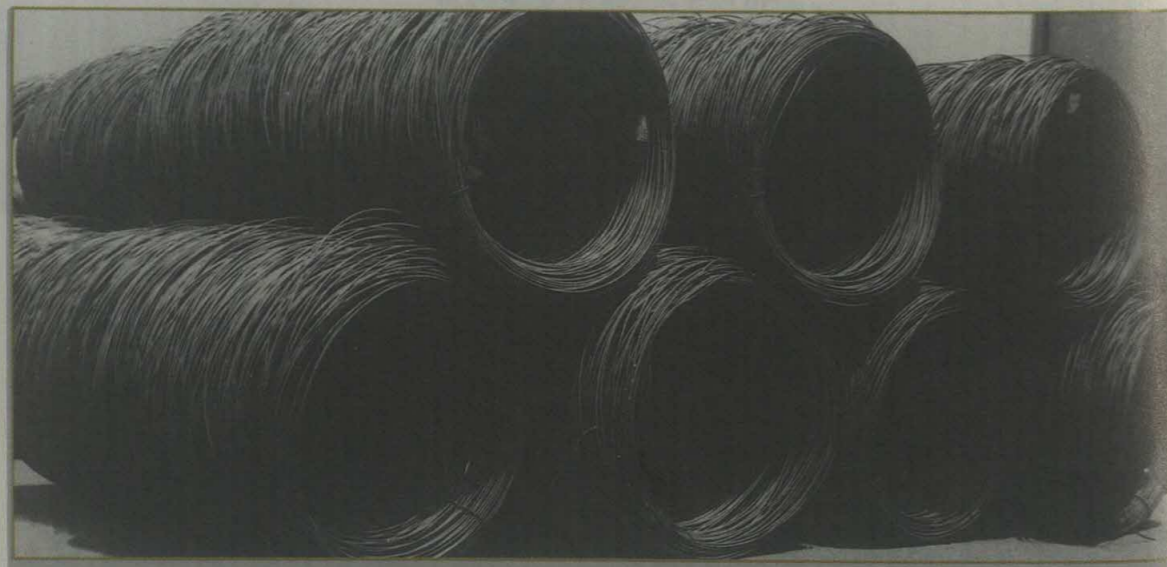
Alhaji Zayyana Ahmed hails from Malumfashi in Katsina State. He is a graduate of Ahmadu Bello University, Zaria where he obtained his Bachelor's degree in Accounts in 1976. Prior to his joining the company in March, 1981, Zayyana Ahmed had worked as an Accountant with the Federal Ministry of Education, Lagos, and as a Principal Accountant with Kaduna State Housing Authority. He was promoted to the rank of Ag. General Manager in June 1989.

Engr. Isyaku A. Faskari was born in Faskari, Katsina State on June 15, 1948. He attended Government Craft School, Mashi, (1963-1965), Government Technical College, Kano (1965-1968), Leningrad Polytechnic Institute, USSR (1969-1970), Kharkou College of Mechanical Building Engineering, USSR (1970-1974) and Manchester University, United Kingdom (1975-1976). He holds the Degree of Bachelor of Science, Mechanical Engineering. Engr. Faskari worked with Defence Industries Corporation under the Ministry of Defence as a Mechanical Technician (1968-1969). He was also Head of the Mechanical Engineering Department, Ministry of Education, Kaduna State (1978-1981). He also had several part-time working experiences in Mechanical Engineering outfits in the USSR, West Germany and Japan. He joined the KSRC as Assistant Chief Engineer in 1981. Engr. Faskari is a member of the Association of Iron and Steel Engineers, and council member, Corrosion Association of Nigeria.



Engr. I. Faskari  
Acting DGM (MTS),

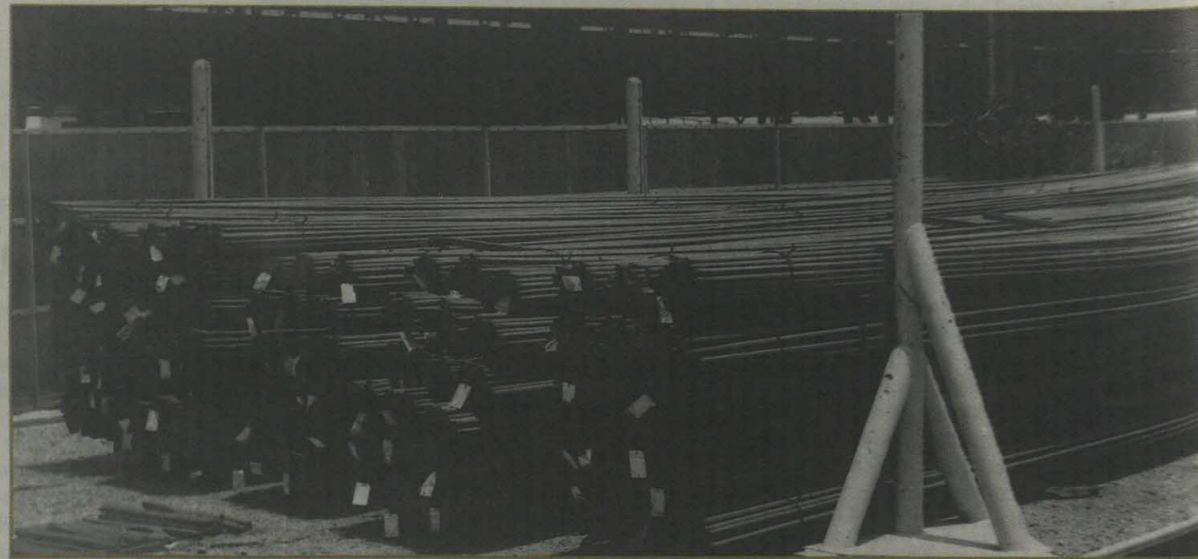
Pix 8.8



Wire Coils

Pix 8.9

Steel Bars



Pix 8.10

#### Wire Straightening Facilities

The facility has four units of wire straightening machines for the production of 6mm and 8mm bars. In view of the fact that the units became obsolete and were beyond economic repair but have previously contributed to about 20 per cent of sales turnover, the Federal Ministry of Power and Steel gave approval to replace the machines. Delivery of the replaced machinery has already been effected and installation by KSRC staff has been completed.

#### Electric Power Plant

In order to avoid the attendant problems of being wholly dependent on NEPA for power supply, the company acquired electric power plant consisting of 3 x 9 MVA and 1 x 1 176.5 KVA generators. The plant was commissioned in March, 1984. The plant is normally operated during production hours, whereas power from NEPA supports the furnace and other ancillary facilities at other times. The power plant has a provision for a fourth engine to increase the installed capacity to 36 MVA; and the required civil-structural work has already been completed.

#### Double Strand Rolling

Due to the increasing demand for small diameter bars, the company was able to modify the existing facilities for use on 2-strand basis whereby two billets could be rolled simultaneously. As a consequence, the productivity for 12mm and 14mm bars was increased by about 50 per cent.

#### Computer Centre

In order to enhance the administrative efficiency of the company, a Computer Centre consisting of two units WANG VS-8, 4 disk drives and several stand alone IBM micro computers have been acquired. The company is planning to up-grade the system in order to provide an integrated information network.

## PROGRESS SO FAR

### Production Progress Report

The company has for most years achieved the highest production figure among the federal government owned inland mills. In 1985 and 1986, the company produced about 75,200 and 62,535 tonnes of steel products, respectively.

However, it should be noted that due to the shift in production towards smaller product diameters of 100mm and below, the plant capacity has been substantially reduced to about 150,000 tonnes per year (on 3 shift basis) in the last three years. The total output between 1982 and December, 1991 was 357,660 tonnes.

### Sales

The company has from inception to date been able to attract customers from such diverse areas of the country as Kano, Kaduna, Onitsha, Aba, Port-Harcourt, Lagos and Abuja. It is also believed that there is a substantial market for 6mm/8mm bars in neighbouring Niger Republic. The commulative turn-over since commissioning is N529,649,441.00.

### Future Plans

As a strategy for enhancing profitability, the company has recommended to the government forward integration of the wire drawing plant whereby its output would be used for the manufacture of welding electrodes. The recommended plant capacity is 4,000 tonnes per annum. Feasibility studies conducted by NIDB Limited on KSRC's behalf indicated good financial return on the project. All the negotiations on the technical and commercial terms of the project with Messrs Kobe Steel of Japan have been submitted to the government for consideration.

## Chapter 9

# NATIONAL STEEL RAW MATERIALS EXPLORATION AGENCY, KADUNA

## HISTORY

The need for a viable raw materials base for the nation's iron and steel industry informed various government policy thrusts since pre-independence days in the emphasis being placed on the sourcing of raw materials locally in our industrialisation efforts.

The economic advantage of local sourcing of raw materials to the mineral based industries include amongst others; foreign exchange savings and maintenance of healthy balance of payment, true economic and political independence from foreign suppliers, employment generation and rapid development of the hinterland with attendant socio-economic gains.

It was towards realising these goals that the Federal Government promulgated in 1971, Decree No. 19 setting up the Nigerian Steel Development Authority (NSDA) with the responsibility amongst others, of carrying out detailed exploration of local sources of mineral raw materials required for the establishment of an iron and steel industry.

National Steel Council Decree 60 repealed the Steel Development Authority Decree No. 19 of 1971, thus establishing six autonomous companies with the exploration and mining division of the National Steel Council metamorphosing into National Steel Raw Materials Exploration Agency in 1987.



Engr. Wakawa Musa  
Chief Executive, NSRMEA

Pix 9.1

Engineer Musa B. Wakawa, an indigene of Borno State, holds a Masters degree in Metallurgical Engineering, a Diploma in Mining Engineering, a Fellow of Advanced Engineering of the Massachusetts Institute of Technology, and also a Fellow of the Nigerian Metallurgical Society. Engr. Musa B. Wakawa started his working life as Shift Engineer with Amalgamated Tin Mines of Nigeria, Bukuru, Plateau State, from 1967-1970. A pioneer in the defunct NSDA, he was responsible for setting up the Metallurgical Research Centre, Ikeja, between 1975-1976. He worked with the defunct NSDA Research Laboratory Jos, between 1977 and 1979 before being given the responsibility to supervise the implementation of the Ajaokuta Steel Company Limited as Assistant General Manager, Production, and served as Senior Assistant General Manager (Rolling Mills) between 1982-1984. In 1984 he was appointed co-ordinator of ASCL. On the appointment of a substantive General Manager, he moved to Lagos as Deputy Director, Mines Department of FMMP&S between 1989 and September 1990. He was appointed Acting Director, Mines Department from 1990 to September 1991 when he was redeployed to National Steel Raw Materials Exploration Agency as Director/Chief Executive.



**Core Drilling for Chromite at Tungan Kudaku, Anka L.G.A. Sokoto State**

*Pix 9.2*

## GROWTH

Since the commencement of work in 1971, the National Steel Raw Materials Exploration Agency has expanded (from being an Exploration and Mining Department of the defunct NSDA) into a large organization made up of three major departments and five zonal offices: operations, service and administration departments; Akure, Bauchi, Kaduna, Makurdi and Owerri zonal offices.

The Agency has one of the largest single concentration of highly trained technical men in the various specialised fields of geosciences - exploration geologists, geophysicists, engineering geologists, hydrogeologists, surveyors, drilling engineers, palaeontologists/sedimentologists, analytical chemists and other supporting staff.

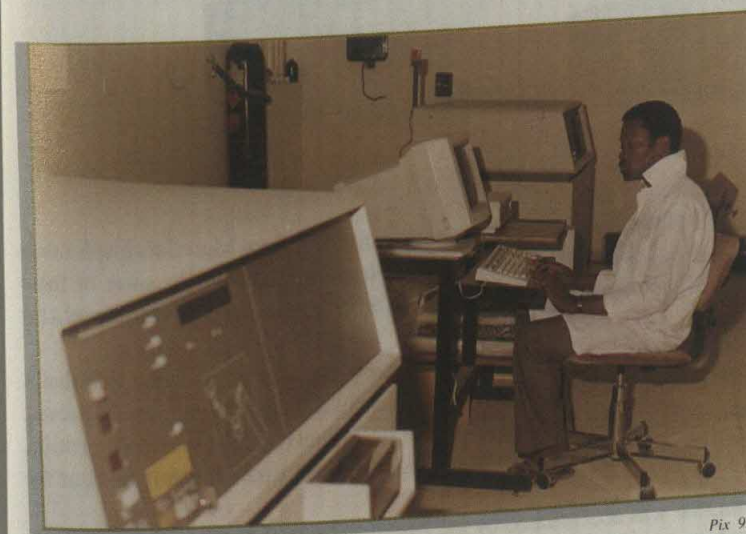
The Agency undertook the investigation of the Itakpe Hill Iron deposit at Okene, Kogi State, where 310 million tonnes of iron ore assaying 39 per cent Fe was proved. This can be beneficiated to 68 per cent iron concentrate. The Lafia/Obi cokeable coal with an estimated commercial reserve of some 32 million tonnes was also investigated. Further detailed studies is programmed to improve our knowledge of the manageability and usability of the deposits and to also upgrade the service.

The Agency extended the search for refractories and fluxes to Onibode, (Abeokuta) Ogun State, where 2.8 million tonnes of refractory clay has been estimated. Others are the Osara dolomite deposit in Kogi State with a proven reserve of 2.8 million tonnes; Burum dolomite in the Federal Capital Territory with reserve of 4 million tonnes, the Mfamosing limestone deposit in Cross River State with a reserve of 28 million tonnes and the Ubo marble deposit with a reserve estimate of 20 million tonnes.

Bauxite, an acid flux and refractory is at present being investigated at Orin Ekiti (Ondo State), Oyan (Oyo State) and on the Mambilla Plateau along Nigeria-Cameroun border. Silica materials for foundry purposes are being explored on the Efon Psammites (Ondo State) and Eku sands (Delta State).

Also ferro-alloys for the production of special steels, namely: manganese, nickel, chromium, wolfram, tungsten and tantalite are being investigated at Kaduna, Sokoto and Plateau States.

It is noteworthy that, it was the successful pioneering effort of the Agency in evaluation of the Itakpe Iron Ore deposit that largely determined the siting of the integrated iron and steel plant at Ajaokuta and the setting up of the Nigerian Iron Ore Mining Company at Itakpe. Mineral raw materials, being depletable assets, require continuous exploration to replenish stock so as to ensure the viability of the steel projects.



**XRF and XRD Equipment, fully computerised**

*Pix 9.3*

## STATE OF PARASTATAL

At the signing of Contract 1717 of 1971 between the Federal Government and the Technoexport of USSR, the Exploration and Mining division of the Nigerian Steel Development Authority was the focal point of activity, but since the splitting up of NSDA in 1979, the status of the Agency has not been properly defined.

For a period (1979-1983), the Agency had operated under the canopy of the steel companies from the Executive Office of the President. At various times, the Agency has been treated as a parastatal or extra-ministerial department/agency with attendant change in names. Thus the Agency has changed names several times from Nigerian Steel Development Authority to





Laboratory Analysis

Pix 9.4

National Steel Council (Exploration and Mining Division) to Steel Raw Materials Exploration Agency; and finally National Steel Raw Materials Exploration Agency. In spite of these changes, the Agency's role has always remained intact as the sole mineral exploration outfit for the steel projects.

At the onset of the steel project (1971-1979), the agency enjoyed prime attention that it deserved with adequate funding, new equipment and clearly defined objectives. However, following the break-up of NSDA, the construction of the steel plants and the steel rolling mills, the Soviet involvement in the exploration process ceased, and inadequate funding became the order of the day.

The general loss of morale was accentuated by the fire disaster that destroyed the administrative block at the headquarters in 1986. Undaunted by this misfortune, the Agency forged ahead in its exploration programme.

It was during the tenure of office of Air Vice Marshal Nura Imam that the Agency was able to muster support for the building of a new administrative block. It was also during this period that effort was made to define and recognise the specialised nature and importance of the Agency's operations. The memo for the enactment of an enabling decree that would formally institutionalise the Agency has been approved by the President-in-Council.

With the recent rationalisation of government's ministries, the Agency has rightly been placed under the steel department of the Ministry of Power and Steel, thereby fully integrating the raw materials exploration, mining and steel making sectors for efficient performance.

The National Steel Raw Materials Exploration Agency is fully awake to its functions, and to achieve this, the Agency has imbibed the policy of maintenance culture where many old equipment acquired and in use since 1971 are being maintained and used to fulfil the mandate of the Agency as stated by government.

Staff welfare has received a boost, and the morale of staff has been raised as the future of the Agency now looks attractive with a pension scheme in place.

The new administrative block and laboratory complex having been completed and equipped,

and old rigs and vehicles being refurbished, the National Steel Raw Materials Exploration Agency is set (like in the days of the defunct NSDA) to ensure that the goal of sourcing mineral raw materials locally for a viable and self reliant iron and steel industry is realisable. Its immediate goal now is meeting the requirements of the Ajaokuta Steel Plant.

## Chapter 10

# NATIONAL IRON ORE MINING COMPANY LIMITED, ITAKPE

## HISTORY

The Federal Government, on April 14, 1971 promulgated Decree No. 19 setting up the Nigerian Steel Development Authority (NSDA) with the following responsibilities: Planning, constructing, operating and maintaining iron and steel plants in the country; Conducting, managing and co-ordinating surveys, mining operations and other necessary activities for obtaining in Nigeria, raw materials of the kind needed for iron and steel production; Establishing facilities and conducting tests and operations for ascertaining and improving the qualities and performance of the raw materials and processes.

In 1979, the Decree No. 60 (dated September 18) dissolved the NSDA and established six companies to foster the national steel industry. Among these companies, the AOMC which was developed from the mining division of the defunct NSDA, inherited all the responsibilities of NSDA in the field of mining and production of iron ore and other raw materials for steel making.

To avoid an overlap in functions, the supervising ministry, Mines, Power & Steel, rationalised the roles and responsibilities of the parastatals under its purview, and in February, 1987, AOMC was renamed National Iron Ore Mining Company Limited (NIOMCO). Accordingly, NIOMCO's responsibilities of exploring, exploiting and processing for the Nigerian Steel Industry were in principle restricted to iron ore.

## ITAKPE IRON ORE PROJECT

To carry out its responsibilities, NIOMCO is exploiting, first of all, the Itakpe Iron Ore deposit near Okene, Kogi State. This deposit has a proven iron ore reserve of about 200 million tonnes with an average of 35 per cent Fe content. The Itakpe Iron Ore project is to supply the total (2.15 million tonnes per year) iron ore requirement of Ajaokuta Steel Company. In addition, it is contemplated to supply about 40 per cent of Delta Steel Company's requirement corresponding to about 550,000 tonnes per year.

The quantities of the concentrates for Ajaokuta and Delta Steel Plants will correspond to 5.46 million tonnes and 1.82 million tonnes of run-off-mine ore, respectively per year. This will involve additional excavation of over 20 million tonnes of waste materials.

The operation involves blast-hole drilling, charging (with explosives) and blasting, loading and transportation of the broken materials. These are achieved by use of huge mining and ancillary equipment, such as rotary drills, hydraulic shovels, dump trucks, excavators, explosives, trucks, e.t.c.

The life of the Itakpe Iron Ore project is estimated conservatively at 25 years. By the end of



Beneficiation plant, Itakpe Project

Pls 10.1

the project, the Itakpe Hill iron ore deposit must have given way to an enormous pit, one hundred metres deep.

Due to its relatively low iron ore content of 36 per cent, the Itakpe run-off-mine ore must have to be up-graded to obtain its concentrate of the quality (64 per cent Fe) required for Ajaokuta. This will be up-graded further into super-concentrate with 68 per cent Fe for the Delta Steel Plant. The two stages of up-grading the ore will be achieved through a sophisticated process which involves crushing, homogenising and beneficiating for the concentrate, then regrinding and floating for the super-concentrate.



Engr. A.D. Famuboni  
Gen. Manager/Chief Executive

Pls 10.2

Engineer A.D. Famuboni was born in Shagamu, Ogun State on October 14, 1939. A graduate of the University of Ibadan and the I.T.C., Netherland, Engineer Famuboni has attended several professional and management courses in Europe and America including a course on policy and management of public enterprises in developing countries at the Harvard Institute for International Development, Harvard University, Cambridge, Mass U.S.A. He has been Director/Chief Executive, Steel Raw Materials Exploration Agency, Kaduna; Project Director/Chief Executive, National Metallurgical Development Centre, NMDC, Jos; Commissioner for Information and Culture, Oyo State and Special Adviser to the Governor, Osun State. He is a Fellow and member of Council of the Nigerian Mining and Geosciences Society, and former National Vice President of the Society.

### STATE OF NIOMCO BEFORE 1985

The depression in the economy significantly affected the operations of the company. The major contracts for the beneficiation plant, Osara Dam and civil works awarded in 1983 were not signed; and consequently not put into force during the year 1985, resulting in a serious set back in the project. Most of the mining equipment were grounded due to lack of spare parts in the country and due to late release of import licences by the government. The annual allocation to the company fell from N36 million to N10 million. Despite the unfavourable conditions with corresponding constraints, the company made modest progress in the execution of its various projects, e.g.

- Development work of the 3.5 kilometre long access mine road was completed and mine put into production.
- About 200,000 tonnes of iron ore were won and stockpiled.
- Considerable progress was made in the execution of ancilliary facilities projects including the temporary power supply, multipurpose hall, medical centre, staff housing, mine laboratory and mine main workshop

### NIOMCO, 1985-1992

#### (i) 1986-March 1989

Between 1986-1989, the company continued to make progress towards the realisation of its objectives. The iron ore stockpiling activity was executed with renewed vigour, and about 400,000 tonnes of raw ore was added to the stockpile. During this period, the major contracts were signed and mobilisation of contractors on site started.

The depression in the national economy continued to affect the level of the company's operation.

#### (ii) April 1989 to-date

From April 1989 to December 1992, the Itakpe Iron Ore project made a giant stride in all its areas of activities. The iron ore stockpiling rose from 0.8 million tonnes to about 1.6 million tonnes. Priority was given to production activities, and the maintenance culture was pursued vigorously. Other areas of the project recorded significant progress due to special interest of the ministry and a dynamic follow-up. The highlights are as follow:

#### Industrial Plants

- Comprising the primary and secondary crusher.
- The homogenisation stockpile in the stacker and the reclaimers
- The storage bins, the grinding mill and the wet screening plant.
- The beneficiation lines, (those for concentrate and super concentrate) the thickener and the storage facilities.
- The ancillary facilities for the maintenance of the plant and the loading station.

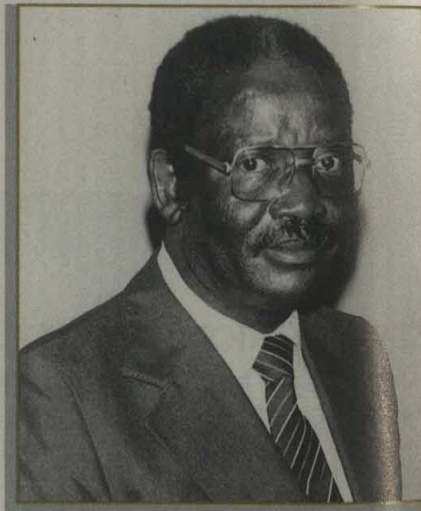
The overall progress in the erection rose from 5 to 60 per cent during the period of the present minister.

### CHAIRMEN OF BOARD OF DIRECTORS OF NIOMCO 1980 — 1992



**Dr. Alex Fom**  
1980-1982

*Pix 10.3*



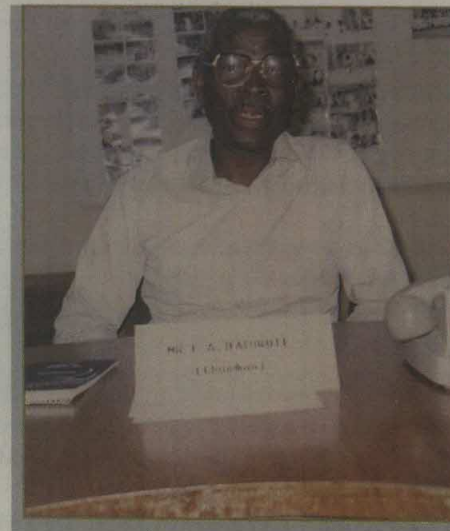
**C.C. Onoh**  
1982-1983

*Pix 10.4*



*Pix 10.8*

Work going on at Osara Dam Site



**Mr. Haturoti**  
1984-1987

*Pix 10.5*



**Engr. U. Ummakwe**  
General Manager/Chief  
Executive (1980-1989)

*Pix 10.9*



**Alhaji T. Abdullahi**  
1987-1989

*Pix 10.6*



**Prof. S. Olunloyo**  
1991-1992

*Pix 10.7*



**Mr. .O. Ayeni**  
General Manager/Chief  
Executive (1990-1991)

*Pix 10.10*

### CIVIL WORKS AND OSARA DAM

This comprises the civil work for the beneficiation plant and the Osara water dam. The progress recorded rose from 20 per cent in 1989 to over 70 per cent in December 1991. Additional provision is made in the project to supply water to the Kwara and Kogi States utility boards respectively.

### WATER SUPPLY

Contract comprises the

- Pumping stations
- Piping network
- Drinkable water
- Distribution network.

The contract was signed and put into force in 1991.

### POWER SUPPLY

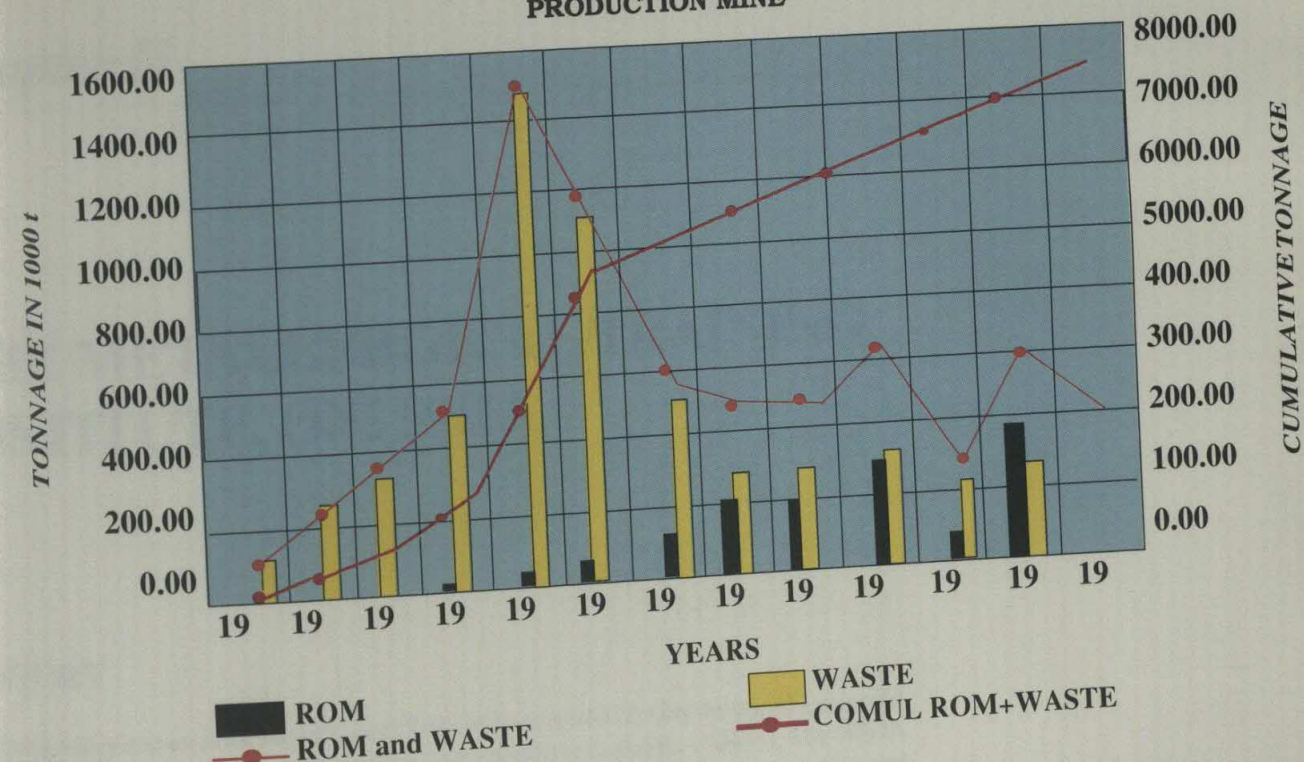
The power supply contract for the Itakpe project was signed and put into force, and the physical progress is 75 per cent. The 132KV overhead transmission lines to link Itakpe project with the national grid is also in progress.

### COMMISSIONING OF ITAKPE-AJAKUTA ORE RAIL LINE AND LAUNCHING OF AJAKUTA-WARRI RAIL LINE

The standard gauge railway chosen for the bulk delivery of iron ore concentrate to Ajaokuta Steel has registered considerable progress. The completed line was commissioned by the President and Commander-in-Chief of the Armed Forces on September 27, 1990. Simultaneously, the Ajaokuta-Warri Ore rail line (for the transportation of super-concentrate to Delta Steel plant from Itakpe and also for transporting coking coal from Warri to Ajaokuta) was launched and the construction is in progress.

During the period under review, the company, despite its meagre financial resources, consolidated and reinducted the maintenance culture of all the equipment and existing facilities. Financial control was instituted, and series of measures aimed at increasing productivity of the mine were introduced.

ITAKPE PROJECT PRODUCTION MINE



Graph 10.1

Table 10.1

ITAKPE PROJECT PRODUCTION

YEAR	R.O.M. (mt)	WASTE (mt)	TOTAL (mt)	CUMUL
1979		154.59	154.59	154.59
1980		274.30	274.30	428.89
1981		318.37	349.27	778.16
1982	23.50	532.87	556.37	1334.52
1983	45.65	1498.28	1498.28	1498.28
1984	81.43	1543.93	2878.46	2878.46
1985	117.98	466.75	584.73	4447.14
1986	216.63	289.29	505.92	4953.07
1987	207.22	301.70	508.92	5461.67
1988	304.29	335.40	639.69	6101.67
1989	59.18	232.50	291.67	6393.35
1990	359.43	263.56	622.99	7016.33
1991	237.60	173.18	410.78	7427.11
1992				

## Chapter 11

# THE METALLURGICAL TRAINING INSTITUTE, ONITSHA

### HISTORY

What is today known as the Metallurgical Training Institute (MTI), Onitsha could be regarded as an offspring of the defunct Nigerian Steel Development Authority (NSDA). The NSDA which was established by Decree No. 19 of April, 1971, was entrusted with the operation and maintenance of the Nigerian Iron and Steel Industry. Thus, when the NSDA later gave way for the establishment of the present federal government steel plants and rolling mills as well as other allied metallurgical industries, the MTI was charged with the responsibility of training and developing technical maintenance, installation and repairs personnel for these government steel projects.

### THE OBJECTIVE OF THE MTI

Informed by the desire to ensure the viability of the steel and allied metallurgical industries, the Federal Government, under General Olusegun Obasanjo (rtd.), decided to establish a highly practical and production-oriented engineering training institute in Onitsha - the Metallurgical Training Institute.

The immediate direct impact of the Institute on the country's economy include:-

- (i) a drastic cut-down on Nigeria's dependence on foreign technical training, thereby conserving scarce foreign exchange; and
- (ii) ensuring a pool of indigenous technical workforce to smoothly commission, operate and maintain the metallurgical industries without over reliance on foreign experts.

### ESTABLISHMENT/LOCATION OF THE INSTITUTE

In 1978, the initial technical feasibility report for the eventual establishment of the Institute was submitted to the Federal Government. Onitsha was the ultimate choice - a 74 hectare of land between km 8 and 9 along Onitsha/Owerri Road. As a follow-up to this report in 1978, the then Federal Government sought for, and obtained foreign assistance from the government of the Federal Republic of Germany through her Agency for Technical Co-operation (GTZ). The German Government offered a soft loan of 50m Dutch Mark with 3½ per cent interest and a five-year moratorium repayable in fifteen years. In addition, there was a "Technical Assistance" grant of 25m Dutch Mark. These were to help set up and operate the Institute.

Thus in April, 1963, the first batch of trainees drawn from the steel industries commenced training in the present temporary location. Construction work at the permanent site is still in progress.

### SPECIALIZED COURSES IN THE MTI

To realise its objectives, the federal government delimits MTI's specialised courses to five, all of which are three years practical/production-oriented. These are:-

- Heavy mobile maintenance,
- Steel construction & structural fitting,
- Industrial electrical installation & maintenance,
- Metallurgical plant equipment maintenance, and
- Instrumentation & control

The Institute has been graduating technical personnel into the labour market since 1987.

### MTI: PRESENT SET UP

The Metallurgical Training Institute is headed by a Director who is the Chief Executive. The Institute has two broad areas in its operations namely:

Training and Service departments including Personnel Management/Administration, Finance and Supplies, Planning, Research & Statistics and Works. The Liaison Office in Lagos reports directly to the Chief Executive, while the Internal Audit and Insurance Units are attached to the Director's Office.

### TRAINING DIVISION

The training division is headed by a Deputy Director (Training) with five major trade departments in addition to General Studies. The Trainees' Affairs Office and the production unit are directly attached to Training Administration. The five specialised trades include:-

- Metallurgical Plant and Equipment Mechanical Maintenance,
- Industrial Electrics,
- Structural Fitting and Construction,
- Instrumentation and Control System Maintenance,
- Heavy Mobile Equipment Maintenance

The Department of General Studies oversees the operations of the Institute's Library while the Trainees' Affairs Office responsible to the Deputy Director (Training) sees to the trainees' welfare.

Mr. E. A. Ige attended the Central School (Sudan Interior Mission), Egbe, Middle School, Okene, Barewa College, Zaria and the Nigerian College of Arts, Science and Technology, Zaria. He obtained a Bachelor of Science (Honours) Degree in Physics at the University College, Ibadan in 1963 and a D.I.C. in Applied Geophysics at the Imperial College of Science and Technology, London in 1965.

He has worked in various capacities in the public service including an attachment service to the United Nations Development Programme for Mineral in Northern Nigeria. He has participated and led numerous geophysical services and investigations and was National Vice-Chairman, National Gravity Network Project (NGNP).

Mr. Ige is a member of several professional bodies, including the European Association of Exploration Geophysicists (EAEG) and a Fellow of the Nigerian Mining Geosciences Society. He was appointed director of the MTI on July 29, 1991.



Fig 11.1

Mr. Emmanuel Ayo Ige  
Director, MTI



**Mr. J. Kult (German)**  
Director

*Pix 11.2*



**Mr. P. Wolfer (German)**  
Deputy Director

*Pix 11.3*



**Engr. S.C. Amugo**  
Deputy Director

*Pix 11.4*

## SERVICE DEPARTMENT

The Personnel Management/Administration department discharges its duties and responsibilities through personnel, transport, welfare, purchasing, security, catering and medical services sections.

The finance and supplies, planning, research and statistics and works as well as personnel management/administration serve as operational departments. In the discharge of their duties they are also responsible to the Director/Chief Executive.

In line with the federal government policy of encouraging government parastatals and ministerial departments to conserve funds and to generate some of their own revenue, the Institute operates an in-house production unit under the Deputy Director (Training) as well as catering services and workers' multi-purpose co-operative shop through administration.

## MTI AND ITS UNIQUENESS IN VOCATIONAL TRAINING

The MTI reinforces its practical/production-oriented training with the procurement of unique technical training equipment through the GTZ of the Federal Republic of Germany under a special technical assistance.

The initial concept to establish the MTI was borne out of the need to seriously reduce the acute shortage of technically trained manpower in the country. Before the establishment of the MTI in 1981, training of technicians and technologists was merely based on more theoretical lectures in our polytechnics and technical colleges without paying much attention to the country's quest to train adequate manpower for her industries.

With the establishment of MTI, a new dimension was introduced. The hitherto theoretical training of technicians was completely changed to more realistic practical training. For this practical training to be meaningful, the German government through GTZ procured and brought in special and sophisticated equipment, replica of what is obtainable in any of our medium or large scale industries. Stocked with these unique equipment, the trainees have the opportunity of practising with these industrial machines which they would later use in the industries.



## Chapter 12

# ALUMINIUM SMELTER COMPANY OF NIGERIA LIMITED, IKOT ABASI

### HISTORY

The Aluminium Smelter Project was conceived as far back as 1981 when Messrs. W. S. Atkins of England was commissioned to carry out a feasibility study on the project. Based on the findings of the study, approaches were made to various vendors in the aluminium industry, including Messrs. Reynolds International of the United States of America which is one of the leading aluminium producing companies in the world.

However, it was not until June, 1986 when a concrete proposal was received from Messrs. Ferrostaal A.G./EBE of Germany in conjunction with Reynolds of the U.S.A. that the present administration started giving serious consideration to the project. Subsequently, a Zurich-based aluminium consulting firm, M+F Engineering Consultants, was appointed to evaluate the proposal together with local counterparts comprising FINCO Engineers, Phoenix Investment Services, and Sheltarch Associates. A presidential task force, under the chairmanship of Alhaji Abubakar Alhaji, was also appointed in March, 1988 to accelerate the articulation of the project.

The articulation of the project, first by the Federal Ministry of Industries, and subsequently by the Presidential Task Force, took quite some time because of its large size and importance. It is pertinent to mention here that in February, 1989, tripartite meetings were held in Washington D.C. between World Bank experts, the technical partners, and government representatives during which various views regarding the project cost, its rate-of-return calculations, as well as ownership structure were carefully examined. On the basis of the outcome of those meetings, and the subsequent ones held in Lagos with the technical partners, the articulation of the project was finalised.

The project which is located in Ikot Abasi (along the Imo River), Akwa Ibom State, envisages the construction of an integrated export-oriented aluminium plant with an installed capacity of 180,000 tonnes per annum for the production of aluminium in various shapes, sizes and weight such as ingots, billets, etc. The major sections of the plant and their respective capacities are summarised below:

- (i) Aluminium Smelter: 180,000 tonnes per annum of molten aluminium;
- (ii) Pot Rooms: 432 pots in 4 pot rooms (2 pot lines);
- (iii) Carbon Anode Plant: This comprises a green mill with a capacity of 27 tonnes per hour (29 blocks of 910 kg. per hour), kilns for calcination of anodes, and anode rodding facilities;
- (iv) Cast House: 180,000 tonnes per annum of VDC products and in-line casting products;
- (v) Captive Power Plant: 6 gas turbine generators of 89.4 MW each having a capacity for operating the Smelter of 320 MW;



**Mr. Fred G. Gunter**  
Chief Executive

Pix 12.1

**Mr. Fred G. Gunter, a U.S. citizen, was born in Germany on September 8, 1927. He had his early education in both Germany and the U.S.A. He holds a Bachelor of Science degree in Electrical Engineering (BSEE) and was trained as an aircraft mechanic and electrician. He worked in various engineering positions in Canada and U.S.A. between 1951 and 1989. He held the position of General Manager, Reynolds International Inc. (Europe) Richmond, Virginia, U.S.A. (1972-1977) and Managing Director of the company for South America, (1984-1989). Mr. Gunter has two professional publications: *The Usage of Aluminium in the Electrical Industry and High Voltage System for Aluminium Reduction Plants*, to his credit.**

- (vi) Plant Infrastructure: Maintenance shop, warehouse, compressor house, water and sewage treatment, transformer repair, emergency oil storage, office building, canteen, etc;
- (vii) External Infrastructure: These include harbour handling facilities, 10km of access road, and a 200 unit housing estate.

The project cost, including cost of required infrastructure (access road, housing, port facilities, etc.) is DM 2.56 billion. Ferrostaal is the turn-key contractor; Reynolds is supplying the technology, while EBE/Reynolds will manage the plant initially before it is taken over by Nigerians.

Following government's approval of the project, and the signing of the various agreements between the federal government and the technical partners led by Ferrostaal AG. in October, 1989 the Aluminium Smelter Company of Nigeria (ALSCON) was incorporated in November, 1989 and a Board of Directors was appointed to oversee the implementation of the project. In February, 1992 the control and supervision of the aluminium project was transferred to the Ministry of Power and Steel, and the chairmanship of ALSCON Board of Directors was accordingly transferred to the Honourable Minister of Power and Steel, AVM N.M. Imam, (Rtd).

The present administration decided to implement the aluminium smelter project in appreciation of the substantial contributions it is expected to make towards the economic development of the country. In the first place, the smelter will utilise a large quantity of the nation's abundant gas resources (mostly flared at the moment) to generate energy for the production of aluminium. It is estimated that approximately 33.6 billion standard cubic feet of gas will be consumed annually when the smelter becomes fully operational. It is equally important to mention that aluminium production is an energy intensive process, and that energy constitutes a significant proportion (approximately 30 per cent) of the value of aluminium, hence the availability of relatively cheap energy has, in recent years, become an important requirement for the

competitiveness of an aluminium smelter plant.

The aluminium smelter project is essentially export-oriented, as the bulk (about 85 per cent) of its products are meant for export. Already, agreement for metal take-up has been signed with Reynolds International which guarantees the sale in the international market (at LME prices), of the balance of the smelter's products, after the needs of the domestic market had been met. Implementation of the project will, therefore, give effect to government's policy of diversification of the nation's sources of foreign exchange.

The project will also supply all the ingots, billets, etc. required by aluminium fabricating companies operating in the country. These companies currently import primary aluminium from other countries. The project is therefore, expected to promote expansion of down-stream activities in the aluminium industry, in addition to conserving, and also earning, substantial foreign exchange for the country. It will also allow re-cycling of aluminium scrap which can easily be re-melted at ALSCON's cast house facilities.

Furthermore, the smelter is expected to stimulate upstream activities leading to the production of required raw materials such as the mining of bauxite which is known to exist in certain parts of the country, as well as the production of petroleum coke and pitch. It will also facilitate the acquisition, by Nigerians, of technical know-how in the production of primary aluminium, and will, in addition, generate substantial employment opportunities. It is estimated that at least 15,000 employment opportunities will be generated, directly and indirectly, from the project.

**Mr. Christopher C. Okoye was born in Oraukwu, Anambra State on December 25, 1941. He attended the University of Nigeria, Nsukka and North-Eastern University of Boston, U.S.A. where he obtained a Bachelor of Science (Honours) in Economics in 1969 and Master of Science in Economic Policy and Planning in 1989, respectively. Mr. Okoye started his career in the public service as a Statistician with the East Central State Government in 1967. He worked for many years in the Federal Ministry of Budget and Planning (1971-1991) where he served variously as Secretary, National Manpower Board, (1978-1986), Acting Director, Social Services and Manpower Department (1986-1987), Director, Commerce and Industry, (1988-1989), and Director, Agriculture and Industry Department (1989-1991). He was appointed Deputy General Manager with ALSCON in February 1991.**



Pix 12.2

**Mr. Christopher Chikwado Okoye**  
DGM (Corporate Planning & Administration)

PRESENT STATUS

Construction of the aluminium smelter plant commenced immediately after government's approval of the project and the signing of the various agreements. The activities of the general contractor, at both its head office in Germany and at the project site in Ikot Abasi, were intensified following the laying of the project's foundation stone by the President, Commander-in-Chief of the Armed Forces, in 1990. As at now, all the technical specifications of the project have been finalised and certified to be in accordance with the stipulations in the agreement. The general contractor has also identified the sources of all the major mechanical and electrical components, and in many cases, engineering designs have been completed and orders placed.

In Ikot Abasi, a lot of work has been carried out in the areas of piling and foundation work, metal fabrication, construction of factory buildings, site offices, stores, and residential accommodation, among others.

Many equipment and machinery have already started arriving in Ikot Abasi, and it is expected that by the end of 1992, many would be ready for erection inside the completed factory buildings. Efforts have also been initiated towards the provision of basic inputs and facilities required for starting production. For example, negotiations have virtually been concluded with the Nigerian Gas Company (NGC) for the supply of gas to the plant, while preparatory work for the dredging of the Imo River to provide maritime access for the plant is also being finalised.

The contractor hopes to complete a number of facilities by the end of the year, including the power house (with two turbines in operation); water treatment plant; compressor house; the workshop; a training centre; and one-third of township facilities together with power supply.

The first phase of the project, representing 25 per cent of the total production, is scheduled to be commissioned in May, 1994.

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