



O. T. OTIS ENGINEERING

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MANAGING GAS TO POWER PROJECTS

INTRODUCTION

A gas turbine generates electricity using natural gas as fuel. Nigeria is enormously endowed with natural gas, hence comparatively advantaged to produce electricity with it. Natural gas is produced as associated gas (accompanying crude oil production) and non-associated gas.

Before the gas can be used, it has to be treated and transported through pipelines to the metering stations. At the metering stations, the gas is then metered and conditioned to meet the stringent requirements of the gas turbines before being sent to the power plants.



Omoku Gas Receiving Station

Nigeria with an enormous gas reserve in the range of 187 trillion cubic feet (Tcf) (5.3 trillion cubic meters) is among the top ten countries with the largest gas reserves in the world. Gas growth demand is driven by power sector with over 70% of gas supply to the domestic market in Nigeria going into power generation.

As the Gas Sector is heading for exponential growth with planned development of new infrastructures and implementation of zero flaring, O. T. Otis Engineering is well positioned to continue to offer expert services in these all important initiatives of the Government of the Federal Republic of Nigeria. Our firm has easy reach to the resources (human and technical) of overseas Technical Partners with access to Funds to execute large projects.



Olorunsogo: Gas Station



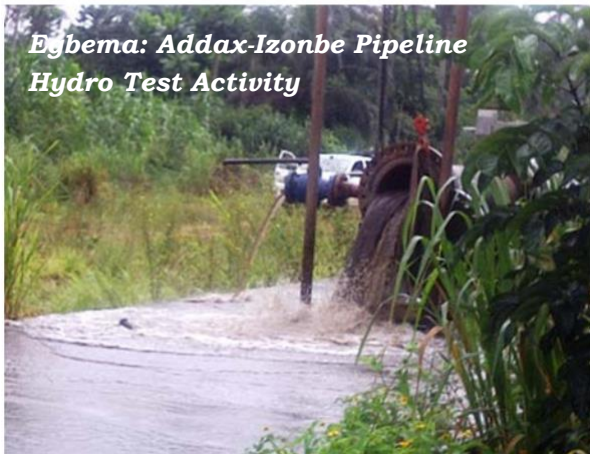
*Alaaji: Pipeline Construction Activities
At the Metering Station*



Gbarain: Civil Works on Access Road To Pig Launcher



Geregu: Electrical Connection of the Flow Computer



Egbema: Addax-Izonbe Pipeline Hydro Test Activity



Calabar: Low Pressure (LP) Separator At the Metering Station

SCOPE OF SERVICES

As Design and Management Consultants for the National Integrated Power Projects (NIPP), O. T. Otis Engineering has the sole responsibility for gas supply and metering facilities projects. Our services in managing 22 No Gas Pipeline Projects and Gas Metering Facilities Projects include the following:

- Preparation of preliminary design, piping and plant layout.
- Preparation of Engineer's Cost Estimate and Payment Schedules
- Preparation of equipment Lists
- Preparation of Tender documents
- Evaluation of received bids
- Managing contract negotiations to clarify the philosophy of projects' execution
- Preparation of Contract Agreements according to FIDIC guidelines.
- Provision of support in the procurement process for gas projects.
- Standardizing & sizing of equipment.
- Review existing schedules for project implementation, etc., undertaking detailed risk / sensitivity analysis of the project schedules
- Monitoring interfaces with NGC, NAPIMS- NNPC, and Oil & Gas companies, all relevant agencies and organizations involved in gas sourcing and gas pipeline development projects.
- Provision of overall supervision of the projects to ensure the projects are delivered on time and within budget.
- Interface with and review the activities carried out by agencies / organizations involved in Gas sourcing and Gas pipeline development.

PROJECTS LOCATIONS

The gas projects of the National Integrated Power Project (NIPP) involve engineering, procurement and construction of gas transmission pipelines and metering stations to supply gas to Niger Delta Power Holding Company (NDPHC) Power Plants. O.T. Otis is the Design and Management Consultant that superintends over the following projects:

- 16" × 14 km NPDC Gas plant to ELPS gas pipeline project
- 18" × 1 km POOC gas plant to ELPS pipeline project for Ihovbor power station
- 18" × 1.5 km ELPS to power station pipeline project.
- Gas metering station project capable of handling about 120 mmscf/d of gas at Ihovbor
- 18" x 1.5km SPDC – NIPP Gbarain power station pipeline project
- Gas metering station capable of handling 70mmscf/d at Gbarain
- 18" x 12km Addax-Izombe – NIPP power station pipeline project
- 18" x 8km Egbema West – NIPP Egbema power station pipeline project
- 18" x 4km Egbema East – NIPP power station pipeline project
- Gas metering station capable of handling 120mmscf/d at Egbema
- 12" × 1.5 km Agip gas plant - NIPP power station pipeline project
- 24" × 53km Oron – Calabar power station pipeline project
- Gas metering station capable of handling 150mmscf/d of gas at Calabar.
- Gas metering station capable of handling about 120mmscf/d of gas at Sapele.
- 16" × 810m "early gas pipeline" project at Sapele
- Integrity Assessment of Oben – Sapele pipeline (16" × 34km)

- 18" × 810m NGC metering station to NIPP Omotosho power station pipeline project
- Omotosho (Ondo State): Gas Metering facilities project for NIPP power station at Omotosho
- 18" × 1.3 km NGC metering station to NIPP Geregú power station pipeline project
- Construction of separate metering facilities to NIPP power plant at Geregú
- 18" × 260m- completion from NGC pipeline to Alaoji power plant.

Alaoji: Unit 2 Gas Scrubber at the Power Plant



Ihovbor: Pig Launcher Installation



Geregú: An excavator preparing the pipeline approach to the gas sales manifold of the new NDPHC metering facility

O.T. Otis is committed to continuous improvement. Our engineers are constantly exposed to advances and developments in the Gas Sector, and regular in-house simulations are conducted to apply the advances to present and future scenarios. We utilize standard packages that are well known for efficiency and delivery of results of required specifications and Industry best practices. Some of the application packages deployed for use by our engineers include HYSYS for process and piping design and Primavera Project Planner for project management.

Armed with a formidable team of seasoned professionals, O. T. Otis Engineering has capacity for high value consulting in the Oil & Gas Sector of the Nigerian economy.



Egbema: A team comprising representatives of O. T. Otis Engineering (Design & Management Consultants), Miden Systems (Project Consultants) and Addax Petroleum Ltd (Gas Supplier) on site visit to determine tie-in coordinates for hook-up for gas supply from Addax Petroleum facility at Izombe to NDPHC Power Plant at Egbema.



Omotosho: New NDPHC Power Plant four-stream Metering Facility mounted on two skids capable of delivering 280mmscf/d



Calabar: Air Compressor on Foundation



Sapele: Gas Pipeline tie-in to the Power Plant Receiving Station

O. T. Otis Engineering has very competent, versatile and well trained, motivated and knowledgeable Gas experts with the back-up of highly professional Consultant Engineers and Experts in other complimenting fields.

ABOUT US

O.T. OTIS Engineering is an indigenous Nigerian company with its Head Office at N0 30/23, Olu Agabi Close, Cadastral Zone CO2, Gwarinpa 1, Abuja, and branch offices in Warri, Benin, Calabar, Omoku, Yenogoa, and Katsina. It is a multi-disciplinary Consultancy company primarily established to provide Engineering Services/Support in the energy, industrial and allied sectors of the Nigerian economy with particular emphasis on Consultancy Services and Project Management, Cost Engineering, Operation and Maintenance of Electro-Mechanical Equipment. **OTIS Engineering** has successfully completed projects in virtually all the facets of the Industrial sector in Nigeria from Machine Tools/Metal Working through Iron and Steel to Automotive Manufacture, Petroleum Refining and Petrochemicals, Electric Power to Pulp and Paper, in over 25 years of existence.



CORPORATE HEADQUARTERS OF O.T. OTIS ENGINEERING