PERFORMANCE EVALUATION OF QUALITY OF SERVICE OFFERED BY POWER HOLDING COMPANY OF NIGERIA(PHCN) TO COLDROOMS IN ANAMBRA STATE FOR HIGHER PRODUCTIVITY.

By

Osueke, G. O.[1]; Nwosuh, E. N. [2] and Adenugba, A.[2]

Mechanical Engineering Department, Federal University of Technology, Owerri.

2.National Productivity Centre, Abuja. Nigeria..

E-mail: osueke2009@yahoo.com Phone: +2348036709727.

ABSTRACT

The quality of services offered by Power Holding Company of Nigeria (PHCN) in the South East state of Anambra was investigated. The researchers investigated the level of performance of this energy subsector in terms of quality performance index of power generated and distributed to cold rooms in the State. The problems encountered by PHCN in electric power generation and distribution were studied and evaluated comparatively to what obtains in similar economies, through industrial engineering techniques of work study. The method of evaluation of the problems included use of questionnaires, work design, work analysis, work measurement, and data analysis of the collected results. The evaluation of quality of services covered the operations of PHCN from 2008-2010 in the areas. The results showed that PHCN performed below average with 42% in Anambra State and therefore require improvement in supplies to cold rooms. This will be a guide to further studies in other states for an improved productivity in Power supply in Nigeria.

Keyword: Quality, Evaluation, Service delivery, Productivity.

INTRODUCTION.

Sustainable electric power supply is the prime mover of technological and social development. There is hardly any enterprise or indeed any aspect of human development that does not require energy in one form or the other – electric power, fuels etc. Nigeria is richly endowed with various energy sources, crude oil, natural gas, coal, hydropower, solar energy, fissionable materials for nuclear energy. Yet the country consistently suffers from energy shortage, a major impediment to industrial and technological growth. The National Electric Power Authority (NEPA)[1],is responsible for managing the generating plants as well as distribution of power nationwide. The total generating capacity is about 3000MW, approximately thrice the current level of national demand. However, the actual power available at any given time is less that 40 percent of the total capacity due to poor maintenance; hence there is a perennial shortage. This

situation is exacerbated by a grossly inefficient, poorly maintained distribution system. Industries can only cope with power outages by resorting to internal generating plants (Ajanaku 2007; Adegbamigbe 2007).

However, when electricity goes on and off five times in an hour, this creates serious problems for manufacturing and industrial sectors.

Technological infrastructure is an enabling environment required for rapid growth of technological and industrial development and comprises physical and human variables like energy, water, transport, communication, financial and human capital (Chenery 1960; Afonja 2003). Ability to provide and effectively apply these inputs is a direct indicator of the various levels of development worldwide. The role of private sector in providing technological infrastructure varies significantly between nations. On one extreme is the group of nations (for example United States of American) in which the private sector provides virtually all technological infrastructure while at other end is the group in which the government is responsible for nearly all (for example China). In between is a group comprising mainly developing countries which are in varying degrees of transition from public to private ownership of technological infrastructure. Nigeria falls in this last category (Arikpo 1967; Thirlwall 1989).

PROBLEM STATEMENT:

Power supply in Nigeria is not a recent issue, judging from the fact that electricity was first generated in Nigeria in 1896, just a decade after its introduction in Europe, according to Ubogu (1985). In 1953, the total electricity consumption was only 77 million KW, however, which grew to 4066 million KW hr in 1980. The consumption has been at increase, with increasing population. But unfortunately, the utility company in Nigeria, the PHCN, is not able to meet up with this increasing demand. Nigeria with population of over 140 million was only able to generate about 4000MW as against over 100,000MW needed to transform the economy of the country.

NEPA which until 31st May 2005, a government Parastutal, has the sole responsibility for managing the generation as well as distribution of power in Nigeria. Although the name was changed to Power Holding Company of Nigeria (PHCN) since 31st May 2005, most people still refer to it as NEPA with interpretation of "Never Expect power Always" instead of National Electric Power Authority. Despite huge capital investment by government in PHCN up to 2008

the parastatal has not been able to satisfy its major objective of supplying the Nigerian public with adequate power.

OBJECTIVES OF THE STUDY:

The objectives of this research are:-

(i) To study the performance and service share of PHCN within Anambra State.

(ii) To identify Electric Power supply problems and proffer solutions for improvement through problem-solving techniques.

(iii) To develop models for predicting service improvement.

SCOPE: This research was targeted at the operations of Power Holding Company of Nigeria in Anambra State, bearing in mind that improvement in their services within the state would impact positively on stakeholders and the other states in due course. Eighteen (18) Cold rooms were sampled in the State.

METHODOLOGY:

The method used for the solutions to service delivery problems were as follows:

- Structured Questionnaires were produced and administered.
- Data collection/interviews from target organizations.
- Eighteen (18) Cold rooms were sampled in each State.
- Work design/ performance modeling.
- Work analysis.
- Work measurement techniques.
- Data analysis and reports.

RESULTS AND ANALYSIS.

Table 1. How long do PHCN supply Power/day in Anambra State?

HOURS SUPPLIED PHCN	NO. OF C/ROOMS	PERCENTAGE
0 – 2	3	17
3 – 8	14	78
9 – 14	1	05
15 – above	Nil	Nil
Total	18	100

About 78% of Cold rooms had PHCN supplies of 3 to 8 hours per day.

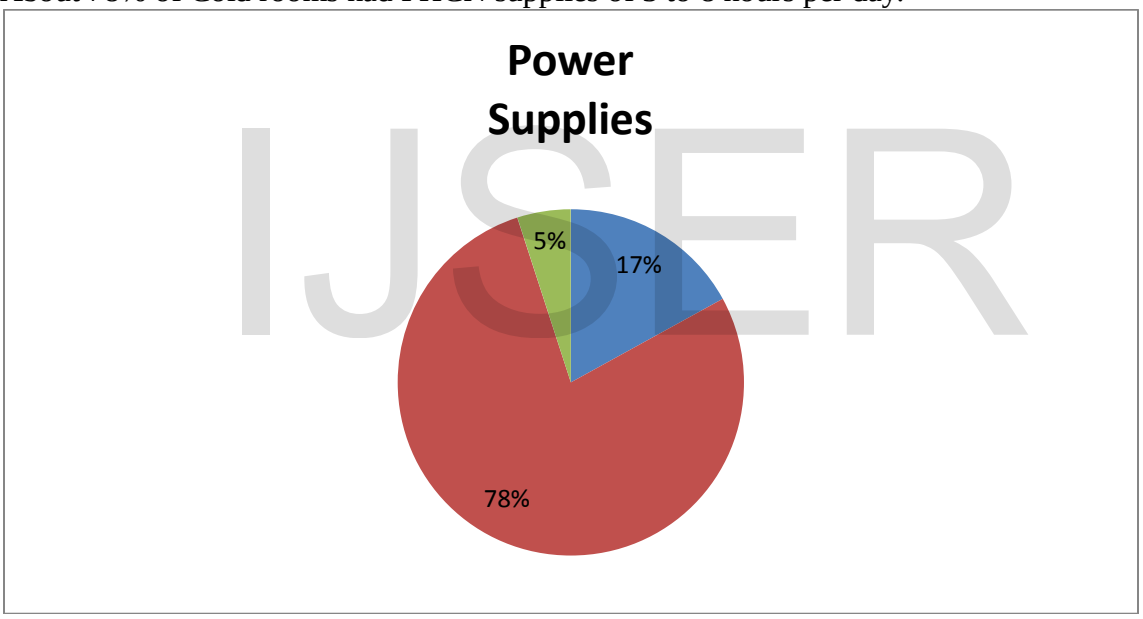

Fig. 1. Electric Power supply assessment.

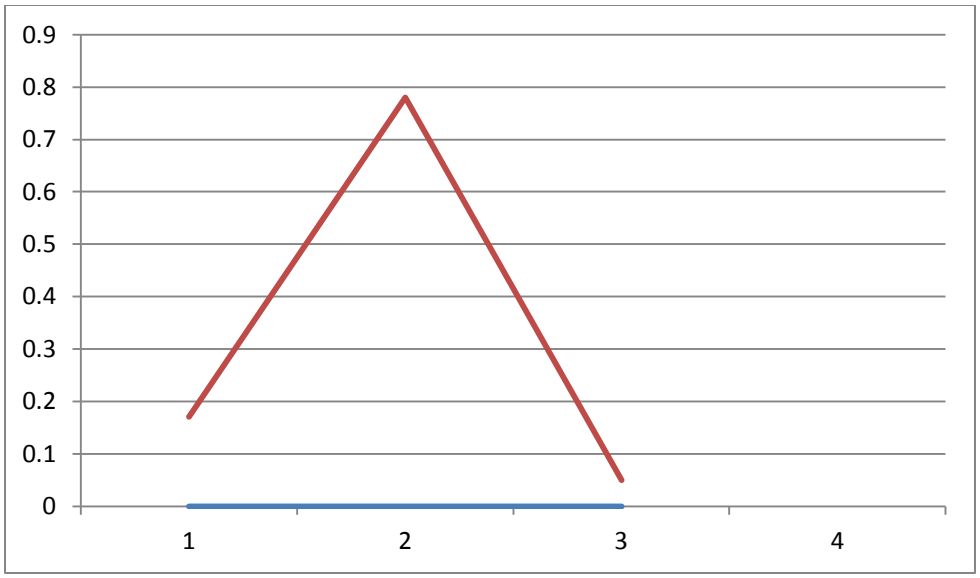

Fig. 2. Coldroom Assessment of Supplies.

1= supplies 0-2hrs/day; 2= supplies 3-8hrs/day; 3= supplies 9-14hrs/day;
4= supplies 15-above hrs/day.

Table 2. Electric Power Pricing &Demand.

Yr.	N/KW.	ANAMBRA
2007	4	249
2008	4	260
2009	6.8	269
2010	6.8	288

Table 3. ELECTRIC POWER DEMAND & SUPPLY (2007 – 2010)

DEMAND(MGW)	2007	2008	2009	2010
ANAMBRA	249	260	269	288

SUPPLY(MGW)	2007	2008	2009	2010
ANAMBRA	129	131	136	136

$\frac{3}{24}\ x\ \frac{100}{1}\ =\ 12.5\%$
$\frac{10}{24}\ x\ \frac{100}{1}\ =\ 42\%$
In terms of power supply by PHCN, services rendered range from 12.5% to 42%. The remaining hours of the day is being covered by use of private generators.
Max hrs of supply to Anambra; $\frac{10}{24}\ x\ \frac{100}{1}\ =\ 42\%$
Residential average $\frac{3}{24}\ x\ \frac{100}{1}\ = 13\%$
Public Offices = $\frac{4}{24}\ x\ \frac{100}{1}\ = 17\%$

Modeling.

Performance Modeling

If we consider P, to represent Productivity, F to represent Funding, and C to represent Corruption, then Productivity is considered as inversely proportional to corruption. Thus,

P = F/C; $\frac{i-x}{i} = Producitivty$
This is supported by productivity and waste equation as shown below:
Productivity,
P = $\frac{OUTPUT}{INPUT} = \frac{INPUT-WASTE}{INPUT} = \frac{i-X}{i}, AS\ X \Rightarrow 0$
When funding increases as corruption increase, performance decreases.
When funding decreases as corruption decrease, performance increases.
When funding decreases at slower rate than corruption, P increases.

Cost Modeling.

Average PHCN bill B_P = N8.5/kwhr
Average hour of electricity supply by PHCN AV_p = 7hrs
Average appliance rating AV_r = 5kw
Cost of power provided by PHCN per day $C_p = B_p*AV_p*AV_r$
= 8.5*7*5 = N297.5

Theoretical cost of power provided by PHCN paid per year
= $365*C_p$ = 365*297.5 = N108587.5

But this cost is subsidized by the Nigerian Government. From the questionnaire recovered the average cost of power provided by PHCN per year = N31,115.8

Generating set energy charge C_g = N22.5/kwhr
Average hours of operating generating set AV_g = 6hrs

Average Generating set power rating P_r = 6.5hp

But 1hp = 750watts, but 1000watts = 1kw

1hp = 750/1000 = 0.75kw

Therefore P_r = 0.75*6.5 = 4.875kw

Cost of operating a generating set in a day = P_r*AV_g*C_g

= 4.875kw*6hrs*N22.5/kwhr

= N658.125 per day

Cost of operating a generating set in a year = N658.125*365

= N240215.63 per year

Total cost spent on power per year **T** = N 240215.63 + N31,115.8

T = N 271331.43/year

S/N	Information	Time/charge
1.	Average PHCN bill	B_P = N8.5/kwhr
2.	Average hour of electricity supply by PHCN	AV_p = 7hrs
3.	Average appliance rating	AV_r = 5kw
4.	Average cost of power provided by PHCN per year	= N31,115.8
5.	Generating set energy charge	C_g = N22.5/kwhr
6.	Average hours of operating generating set	AV_g = 6hrs
7.	Average Generating set power rating	P_r = 6.5hp = 4.875kw
8.	Cost of operating a generating set in a year	N240215.63 per year
9.	Total cost spent on power per year	**T** = N271331.43/year

4.2 COST ANALYSIS OF PHCN FOR A BUSINESS ENTERPRISE

For a cold room which uses a 20KVA generator

Generator energy charge E_g = N22.5/kwhr

Generator power rating P_r = 20KVA

Average hour of operating the generator AV_g = 14hrs

Cost of generating power in a day using a generator = $E_g * P_r * AV_g$

= N22.5*20*14

= N6,300 per day

Cost of maintenance of the generator in a month = N10,000

Total cost spent on the generator in a year = N (10000*12) + N(6300*365)

= N2.42 million

CONCLUSION. Results showed a poor performance (42%), in Anambea State. Within the areas /towns served by the PHCN, we found reasonable installations. But the very poor manpower attitude remains a cankerworm in the system. In addition to poor manpower attitude to work, response to distress calls were hardly timely.

Within the State, the Cold rooms had up to 33% service share as Residential and Public buildings shared 13% and 17% respectively. Mathematical models were developed for a guide to enhanced Electric power service delivery.

RECOMMENDATIONS. The Power Sector requires urgent Government intervention to save it from collapse. Immediate intervention is needed to optimize the existing infrastructure in generation, transmission and distribution. The Researchers are therefore of the view that the overwhelming priority of Government should be to arrest the decay in Generating Capacity which is currently below 3,000MW despite an installed capacity of over 7,000MW. So all efforts should be geared towards optimizing the use of the existing assets for higher productivity.

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