

Views of Estate and Facility Managers on Maintenance Practice of Process Plants in Brewery Industry in Lagos State of Nigeria

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Abstract:- This research analysed the views of practicing Estate surveyors and Valuers in Lagos State on the appropriate maintenance practice adopted for process plants in brewery industry because of the very important role this industry is currently playing in most national economies. The objectives used to achieve the above aim were to: identify the factors that influence useful life of plants in brewery industry; rank the views obtained from practising estate surveyors and valuers on the factors mentioned; obtain and rank the perception of these practitioners on the intervals for implementing the maintenance of process plants in brewery industry; rank the perception of estate surveying and valuation practitioners on intervals for retainerships granted engineers in this industry; and establish how brewery industry keeps track of its maintenance history. Questionnaire was the main instrument for data collection. A census of 317 estate surveyors and valuers were administered with the questionnaires, out of which 272 were successfully completed for analysis representing 80% return. Mean Item Score (MIS) was adopted to analyse the collected data. It was found out among others that technological improvements, frequency of use of plants and age when plant was acquired were the first three most significant factors influencing the useful life of process plants. It was recommended that brewery industry should undertake monthly maintenance to ensure that their operations are not hampered.

Keywords:- Process Plant, Maintenance Practice, Brewery Industry, Estate Managers and Facility Managers.

I. INTRODUCTION

Process plant refers to infrastructure used in operation and maintenance of a given facility, plant in the context of brewery are beverages extraction machine that produce drink which bring refreshment and sociability to individual. International Facility Management Association (IFMA, 2014), assert that Facility Management is a profession that embraces multiple disciplines to guarantee functionality of the built environment by integrating people, place, process and technology, and enhance an organization to operate favorably. It embraces planning and project management; real estate;

operation and maintenance; leadership and management; quality assessment and innovation; human and environmental factors; finance; communication and technology which are the core of estate surveyor expertise. More so, Facility maintenance falls under operation and maintenance core area of facility management, which is a branch of estate management. Facility maintenance of plant covers all sets of activities required to sustain an industry, accomplish its anticipated functions and provide safety at a meagre cost (Erkoyuncu, Fernan-del Arno, Mura, Raykuma and Gino, 2017). The need to keep process plant running continually, improving production, increase value and life longevity of the plant is sacrosanct to the sustenance of the industry, but alas, plant and machinery in Nigeria are not maintained largely owing to poor maintenance tradition and relatively high cost of maintenance (Usman, Gambo and Chen, 2012). The tenacity of this research is to evaluate the maintenance practice of the brewery industry in Lagos from the purview of estate surveyor and facility manager.

The purpose of the study is to analyse the views of practising estate surveyors and valuers in Lagos State on the appropriate maintenance practice adopted for process plants in brewery industry because of the significant contributions of the manufacturing industry to the GDP of most developing countries.

The under listed objectives were used to achieve the above aim to: identify the factors that affect useful life of plants in brewery industry; rank the views obtained from practising estate surveyors and valuers on the factors mentioned; obtain and rank perception of these practitioners on the intervals for implementing the maintenance of process plants in brewery industry; rank the perception of estate and valuation practitioners on intervals for retainerships granted engineers in brewery industry; and establish how brewery industry keeps track of its maintenance history.

The significance of this study is to influence advance work in this field of industrial maintenance practice in Nigeria. Consequently, from literature it appears that there is dearth of knowledge in the field which is counter-productive to the industry in this era of global downturn.

II. REVIEW OF RELATED LITERATURE

Asset management is an important area of national development as no nation can attain greatness without the proper harnessing and the maintenance of her assets be it human and material asset. However it has been observed that the problem of less develops economy lies in the non-maintenance of capital asset. Kaganova, McKeller and Peterson, (2011), have attributed the problem of public property management and maintenance to economic inefficiencies, physical and economic underutilization, and deficient in maintenance and repairs.

Nethmin and Sandanayake, (2017) in their study investigated and positioned the Facilities Manager's role during building life cycle, and reveals that facilities Manager must have a technical training on buildings, services and systems at Handover stage to manage them at the In Use stages. This mirrors the essential role of industrial facilities manager, arguably the estate surveyor and valuer is the right professional with his wealth of experience to galvanize other professionals in the team.

Abdullah (2012) evaluated the determinant factors in the development of maintenance culture in managing public asset and facilities. Findings from the study revealed that in Malaysia the determining factors comprise leadership; communication; rewards and recognition; teamwork; training and education; motivation; involvement; empowerment; policy systems strategy and work planning; and organization structure. Hence, maintenance encompass culture, environment, economy and socio-political setting. The determining factors in Malaysia may be due to advance in technology and manpower but the reality in less developed countries like Nigeria may be different. This calls for further research.

Kemiki, (2011) assessed the facilities management of industrial properties in Minna. The study examined the concept and the totality of facilities management in Imurat International Limited in Minna. Findings from the study reveals machines were all fairly maintained as revealed by the scale between 2.0 and 2.6 for all the machines, the assessment of general facilities reveals that conveniences are the only facilities in good condition. The research was not on a maintenance of brewery therefore could not provide the research with information from the Nigeria experience In addressing this research gap, this paper therefore examine views of Estate and Facility Managers on maintenance practice of process plants in brewery industry in Lagos state, Nigeria.

III. METHODOLOGY, DATA PRESENTATION AND ANALYSIS

Methodology:

Methodology is a descriptive design whereby questionnaire was used for data collection. Out of a population

of 317 estate surveyors and valuers administered with questionnaire, 272 were returned successfully. This was used for final analysis. This represents 80% return and considered good for this purpose. The MIS (Mean Item Score) data analysis technique was used to analyse the estate surveyors' opinion on the maintenance practice in process plants in brewery industry in Lagos State of Nigeria.

IV. DATA PRESENTATION AND ANALYSIS

Table 1. Ranking of Factors Affecting Useful Life of Plant and Machinery in Brewery Industry

| Physical Deterioration | Mean | Rank |
|---|------|------|
| How often it was repaired or renewed or part replaced | 3.71 | 4 |
| How often it was used | 4.07 | 2 |
| How old it was when acquired | 3.90 | 3 |
| Progress in the arts | 3.18 | 6 |
| Prohibitory laws | 3.17 | 7 |
| Reasonably foreseeable economic changes | 3.09 | 8 |
| Shifting of business centres | 3.01 | 9 |
| Technological improvements | 4.52 | 1 |
| The climate in which it is used | 3.22 | 5 |
| Others | 2.41 | 10 |

Source: field survey, 2018

Table 1 above shows ranking of factors that affect useful life of plant and machinery in brewery industry. Technological improvement ranks first with mean of 4.52. Frequency use, age of machinery and frequency of repairs, renewal or part replacement were ranked second, third and fourth respectively with mean of 4.07, 3.90 and 3.71 also respectively. Climate in which it is used, progress of arts, prohibitory laws and reasonably foreseeable economic changes were ranked fifth (with mean of 3.22), sixth (with mean of 3.18), seventh (with mean of 3.17) and eight (with mean of 3.09), respectively. Shifting of business centres was ranked ninth with a mean of 3.01 while others were ranked 10th with mean of 2.41.

Table 2. Maintenance Schedules in Brewery Industry

| | Wee kly | Monthl y | Half- yearly | Yearly | Others |
|------------------------|----------|----------|--------------|----------|----------|
| Turnaround maintenance | 43(2.4) | 59(31.1) | 47(24.7) | 38(20) | 3(1.6) |
| Routine maintenance | 58(3.05) | 74(38.9) | 42(22.1) | 15(7.9) | 1(0.5) |
| Preventive maintenance | 52(2.75) | 91(48.1) | 31(16.4) | 14(7.4) | 1(0.5) |
| Curative maintenance | 55(2.94) | 75(40.1) | 31(16.6) | 26(13.9) | 0(0) |
| Others | 2(4.3) | 12(25.5) | 6(12.8) | 6(12.8) | 21(44.7) |

Source: field survey, 2018

Table 2 above shows the frequency distribution of respondents to maintenance schedule in brewery industry. For turnaround maintenance, 22.4% agreed on weekly interval, 31.1% agreed on monthly interval while 24.7% and 20% agreed on half-yearly and yearly intervals respectively and 1.6% agreed on others. For routine maintenance, 30.5%, agreed on weekly maintenance, 38.9% on monthly, 22.1% on half-yearly and 7.9% on yearly while 0.5% agreed on others. For preventive maintenance in brewery industry, 27.5% agreed on weekly interval, 48.1% on monthly, 16.4% on half-yearly and 17.4% on yearly preventive maintenance intervals. For curative maintenance, 29.4% agreed on weekly maintenance, 40.1% on monthly, 16.6% on half-yearly and 13.9% yearly schedule. For other maintenance types in brewery industry, 4.3% agreed on weekly maintenance schedule, 25.5% agreed on monthly, 12.8% on half-yearly, 12.8% agreed on yearly, while 44.7% agreed on other schedules for maintenance of brewery industry machines.

Table 3. Type of Maintenance Engineers Retained in Brewery Industries

| | Weekly | Monthly | Half-yearly | Yearly | Others |
|---|----------|----------|-------------|----------|----------|
| External service engineer | 48(25.3) | 85(44.7) | 32(16.8) | 22(11.6) | 3(1.6) |
| In-house service engineer | 70(36.8) | 77(40.5) | 28(14.7) | 14(7.4) | 1(0.5) |
| Manufacturer's service engineer | 40(21.3) | 77(41.0) | 49(26.1) | 21(11.2) | 1(0.5) |
| The three (3) types of maintenance service engineer | 38(20.4) | 79(42.5) | 36(19.4) | 30(16.1) | 3(1.6) |
| Outside service contractor | 28(15.3) | 82(44.8) | 42(23.0) | 22(12.0) | 9(4.9) |
| Others | 1(2.5) | 8(20.0) | 5(12.5) | 4(10.0) | 22(55.0) |

Source: field survey, 2018

Table 3 above shows frequency distribution of respondents to types of maintenance engineers retained in various industries. For external service engineer, 25.3% agreed on weekly retained maintenance engineers in brewery industry, 44.7% agreed on monthly, 16.8% agreed on half-yearly, 11.6% on yearly and 1.6% agreed on other retained maintenance engineers. For in-house service engineers, 36.8% agreed on weekly in-house service engineers. 40.5% agreed on monthly, 14.7% agreed on half-yearly, 7.4% agreed on yearly while 0.5% agreed on other retained service engineers. For manufacturer's service engineers, 21.3% agreed on weekly maintenance service engineers, 41% agreed on monthly, 26.1% agreed on half-yearly, 11.2% agreed on yearly, while

0.5% agreed on others. For the three types of maintenance engineers, 20.4% agreed on weekly different types of maintenance service engineers, 42.5% agreed on monthly, 19.4% agreed on half-yearly, 16.1% agreed on yearly, while 1.6% agreed on other maintenance service engineers. For outsourced service contractors, 15.3% agreed on weekly maintenance service engineers, 44.8% agreed on monthly, 23% agreed on half-yearly, 12% agreed on yearly, while 4.9% agreed on others. For other service maintenance engineers in brewery industry, 2.5% agreed on weekly schedule, 20% agreed on monthly interval, 12.5% on half-yearly schedule, 10% on yearly interval, while 55% agreed on others schedule for maintenance of service engineers in the brewery industry.

Table 4. Maintenance History of Plants in Brewery Industry

| | Yes | No |
|--|-----------|----------|
| Keep maintenance history | 174(96.1) | 7(3.9) |
| Indicate other types of maintenance history kept | 51(45.1) | 62(54.9) |

Source: field survey, 2018

Table 4 above shows maintenance history of plants in various industries. On keeping maintenance, 96.1% claimed yes while 3.9% claimed no. On other types of maintenance history the respondents keep, 45.1% claimed yes, while 54.9% claimed no.

V. DISCUSSIONS FROM FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

Discussions on findings:

- Factors affecting the useful life of process plants in brewery industry in order of importance are: technological improvements, frequency of use of plants, age when plant was acquired, frequency of repairs, renewal and replacement of parts and climate in which it is used. Others in the order of rank are progress in arts, prohibitory laws, reasonable foreseeable economic changes and shifting in business areas.
- Ranking the views of practising estate surveyors and valuers in Lagos State show that periods of implementing maintenance schedules in brewery industry follow as listed: turnaround maintenance (monthly), routine maintenance (monthly), preventive maintenance (monthly) and curative maintenance (monthly) as against weekly, half-yearly and yearly being suggested.
- Periods for retaining maintenance engineers in brewery industry as viewed by estate surveyors and valuers in Lagos State should also be monthly for external service engineers, in-house service engineers, manufacturer's service engineer and for all engineers combined.
- Maintenance history kept, as observed by estate surveyors and valuers in Lagos State indicate almost all industries keep record of maintenance of process plants while almost half of industries keep record of other types of maintenance history.

VI. RECOMMENDATIONS

- Brewery industry should observe monthly maintenance of process plants in order to ensure their operations are not hampered.
- Records of turnaround, routine, preventive and curative maintenance history should always be kept both for process plants and for other types of maintenance.
- Practising estate surveyors and valuers in Lagos should keep records of these findings in order to help them in maintenance issues in their property and facility management portfolio.

VII. CONCLUSION

It is important that brewery industry should care for their process plants as suggested by estate surveyors and valuers so as to avoid disruptions in their operations. Estate surveyors and valuers should also acquaint themselves with this article in order to help them in maintenance issues under their property and facility management portfolio.

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