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Impact of Maintenance Strategies on the Performance Of Industrial Facilities In Selected Industrial Estates In Lagos State, Nigeria

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ABSTRACT : *The study appraised the facilities and the maintenance management strategies employed in selected industrial estates in Lagos State by identifying and examining facilities maintenance strategies, and determining their impact on the physical condition of the facilities. This was with a view to establishing the optimal strategies. Data were sourced using structured questionnaire administered on the staff of maintenance department of the industrial firms located in the estates, only building materials and plastic manufacturing industries were purposively selected. The Spearman correlation between reactive maintenance and the physical condition of the walls, roofs, floors, windows and doors, electrical fittings, plumbing, manufacturing plant, and generators had R values of 0.113, 0.24, 0.14, 0.26, 0.28, 0.23, 0.32, 0.41 respectively. The result showed a weak positive correlation (statistic) between reactive maintenance and the physical condition of the facilities. The result of analysis of variance (ANOVA) computed between types of maintenance strategies and the respondents' level of satisfaction on the physical condition of their facilities revealed that the different F values were all greater than 0.05 (P >0.05). In other words there was no significant relationship between the types of maintenance strategies and the respondents' level of satisfaction with the physical condition of their facilities, thus the types of maintenance strategy currently used in the maintenance of industrial facilities had no influence on the physical condition of industrial facilities.*

KEY WORDS: *Maintenance, Strategies, Performance, Industrial facilities, Industrial estates.*

I. INTRODUCTION

Maintenance with respect to facilities and their services is a continued process of the construction industry. Maintenance has ceased to be considered a tactical subject with relevant repercussion regarding company cost, but not profits, and started to be viewed as having a strategic dimension, due to its implication in quality, availability, safety and cost, making it just another requirement for doing business [1, 2, 3]. As a result maintenance performance has direct influence on the fulfilling of the objectives established by an organisation, Consequently, the maintenance function is an important element of modern business and must be managed effectively [4].Therefore, the need for adequate maintenance of the nations assets cannot be over emphasized, especially the industrial sector, which is generally believed to be the life wire of the nation's economy. The author in [5] noted that an effective maintenance management system might be characterized as the product of prudence, of the sentiment that "a stitch in time saves nine" The author in [6] maintained that good maintenance management systems are essential for economically viable and operationally safe facilities. Also, the author in [7] noted that recent research has identified a growing recognition by business managers that the standard of property and facilities management affects the organization as a whole in terms of cost efficiency, service delivery and performance, as well as protecting this substantial property asset. It is generally believed that Industrial sectors are not getting much subsidies and support from the government in real term as expected, and there is thus a greater need for proactive, rather than preventive maintenance management of these facilities [8]. Having an effective maintenance management system in place is critical for maintenance managers of industrial facilities to ensure that maintenance expenditure are kept to a minimum.

Many authorities have studied various aspects of plant maintenance in isolation neglecting such critical issues as the state and conditions of industrial facilities, the effects of maintenance strategies and the impact they have on operational performance of the industrial facilities. This study sought to bring the various aspects of industrial facilities maintenance together to provide a holistic view of the problem and to show how they collectively impact on maintenance of industrial facilities. Through this approach it is believed that maintenance managers of industrial facilities will have a better understanding of the problems and be able to formulate policies to guide their operations from strategy to operational performance.This study appraises facilities maintenance strategies with a view to determining their impact on the performance of industrial facilities. The research work covered only industrial facilities located within the selected industrial estates namely the buildings and facilities within, services, manufacturing plants, driven equipments and the overall cleanings of the surroundings. Only building materials and plastic manufacturing companies listed in the Nigeria business directory and located within the industrial estates were sampled for this research.

II. MAINTENANCE STRATEGIES

The author in [9] identified three strategies, namely: the reactive (day to day) repair preventive (including cyclic and condition-based) maintenance and upgrading. However they fail to include such other maintenance objectives such as satisfy specific and personal changes in taste and to fulfil statutory requirements. According to [10] maintenance manager can decide to carry out periodic maintenance at fixed intervals or carry out regular inspections or simply respond to user request after failure has occurred. The author in [11] believe that all maintenance actions are performed either in anticipation of an element's failure or to logically correct an existing defect.Other authors refer to proactive maintenance and reactive maintenance as planned and unplanned maintenance respectively [12, 13 cited in 14]. The author in [15] noted that maintenance strategy in general includes corrective, preventive or condition-based maintenance

Corrective Maintenance : It has been described as unplanned maintenance [16, 10, and 14]. But the word unplanned is not appropriate in that maintenance action is planned but the logistics of execution allows work to be done only after failure has occurred. The underlying concept is that ALL engineered items are known to fail or deteriorate with time and showing failure is expected or anticipated in facilities. Maintenance may then be FIXED-time OR UNFIXED-TIME based. In the case of reactive maintenance strategy, maintenance action is planned and executed in reaction to a failure occurrence (post failure planning). In this strategic sense, maintenance is in the form of repair work or replacement, and is only performed when facility has failed. Reactive maintenance is merely expressed as a maintenance strategy in which deed of maintenance is actually a reaction to a failure occurrence [17, 9, 18 and 19]. An effective maintenance unit is expected to draw up work programme stating standard procedure to follow upon failure of any component.

There is a strong correlation between safety incidents, injuries, and reactive maintenance. In a reactive situation, maintenance personnel may not take the time they should to plan and think before taking action. The urgent "must be fixed" situation also encourages maintenance crafts people to adopt so called "heroic" measures and take risks they should not take. A reactive, "run till it breakdown", maintenance strategy is often taken for low cost items such as light bulb replacement or for equipment with unpredictable lifespan that are so crucial to operations. The result of reactive maintenance is a steady degradation of equipment performance or a sudden breakdown of equipment. There are some industries that still survive by using a reactive approach, such as certain sectors of the food processing industry. Citing a few large bakeries, for instance they might have three lines running concurrently; if one fails the other two will take up the slack.

Planned Preventive Maintenance (PPM)

Planned maintenance is also known as forward maintenance and involves the forecasting of maintenance needs [20]. In planned preventive maintenance, works are scheduled to be carried out at predetermined times. PPM applies where the incidence of failure can be predicted with some accuracy or where the periods are fixed by statute or contract e.g. the terms in a lease requiring painting to be undertaken at fixed intervals [21]. According to the author in [22] planned maintenance is introduced to overcome the disadvantages of corrective maintenance with the primary objective of minimizing the total cost of inspection and repair and equipment downtime. It is maintenance which can be carried out while an item is in service. It is a concept which is probably more applicable to plant and equipment which is subject to mechanical wear but there are certain building elements which justify this treatment [21]. The author in [23 cited in 21] suggests that planned preventive maintenance is worthwhile if: is cost effective, intended to meet statutory or other legal requirements, meets a client need from an operating point of view, reduce the incidence of maintenance necessitating requisitions for work from user, there is a predominant incidence of work for the craftsman rather than pure inspection. In planned preventive maintenance, planning and execution of maintenance work is carried out in anticipation of failure of facility (pro-active). Preventive maintenance, unlike corrective maintenance, is the practice of replacing components or subsystems before they fail in order to promote continuous system operation. The schedule for preventive maintenance is based on observation of past system behavior, component wear-out mechanisms and knowledge of which components are vital to continued system operation. Cost is always a factor in the scheduling of preventive maintenance. Reliability can also be a factor but cost is a more general term because reliability and risk can be expressed in terms of cost. In many circumstances, it is financially more judicious to replace parts or components that have not failed at predetermined intervals rather than wait for a system failure that may result in a costly disruption in operations.

Condition Based Maintenance (CBM) : This system is also called “Condition controlled maintenance and its presupposes that there will be inspection at appropriate intervals in order to determine by visual means or measure whether or not the condition of the elements or their performance has deteriorated below that laid down [21]. The author in [24] defined condition-based maintenance as “maintenance carried out in response to a significant deterioration in a unit as indicated by a change in a monitored parameter of the unit’s condition or performance while the author in [14] observed that under the CBM concept, a change in condition of the facility is the primary reason for carrying out maintenance on an item. Thus, the optimal time to execute maintenance work is determined from a condition survey, which shows the actual state of each constituent item in a facility. In the case of buildings, this entails physical close inspection of the structure and its external cladding, all internal surfaces and fittings [9].

The author in [25] researched on condition monitoring in the 21st century. He carried out a strategic review of CBM market place in order to identify and assess the changes occurring within the industry and opportunities and threats that the change represented to the organizations. The study outlined some of the key business opportunities and issues which are driving changes in the industry, some resulting trends were drawn and some condition regarding the implication of the trends for CBM equipment manufacturers suppliers and contractors. The author in [26] research investigated whether it is possible to retrospectively improve the quality of facilities failure histories stored in CMM systems. Finding revealed that it is possible to use the reliability centred maintenance and computerize maintenance management systems (RCM and CMMS) data in an ongoing manner and improved its usefulness over time as well as improve historical work orders. Research was carried out using engine data from HMAS Anzac on plant maintenance. The author in [25] study reviewed RCM and outlined some of the results that have been achieved, and how they have been achieved on different case study of maintaining mobile equipment. The study showed that the traditional approach to maintenance of mobile equipment based on fixed interval component replacement and overhaul is rapidly dying and in its place is a new framework for maintaining this equipment using condition based maintenance approaches, which focuses strongly on the consequences of failure. This work focuses mainly on plant neglecting other facilities that are also very important to the organization. The author in [27] conducted a CBM survey designed to determine present applications of CBM systems with industry. The study revealed that CBM is a globally accepted maintenance practice. CBM is most widely used within the manufacturing petroleum refining, chemical and associated products business sector.
No study has examined the impact of maintenance strategies on the performance of industrial facilities in Nigeria, this study will attempt to fill this gap.

III. RESEARCH METHODOLOGY

The research procedure and methods employed in this research cut across the study population and data requirement, sample frame, sampling techniques, sample size, choice of data collection instruments, questionnaire design and techniques of data analysis and presentation. The study population was primarily the maintenance staff of building and plastics manufacturing industries registered with the manufacturers association of Nigeria and located within the selected industrial estates in Lagos state. Maintenance staff comprises technical and administrative staff of maintenance department, maintenance supervisors, and facilities maintenance managers. Data collected for this study were primary data quantitative and qualitative in nature. The primary data collected was through questionnaires administered on the staff of maintenance departments of building materials and plastic manufacturing companies in the selected industrial estates. The sample frame covers all the industrial estates in Lagos. Twenty Two (22) Industrial estates were identified in Lagos State based on information on directory of manufacturing companies prepare by Lagos State Ministry of Commerce, Industry and Tourism. Table 1 shows the list of Industrial Estates located in Lagos State. A total of twenty two (22) industrial estates were identified based on information from the directory of manufacturing companies. The statistically required sample size was calculated from the formula given by the author in [29] as follows:
$n= n1/[1+n1/N]$

Where;
n= sample size
n1 = S1/V2
N= total estimated population
V= standard error of the sampling distribution = 0.05
S1= Maximum standard deviation in population. Total error=0.1 at a confidence level of 95% and S2=(p)x(1-P)= (0.5) x (0.5) = (0.25) where p is a proportion of population elements that belong to a defined class. From this formula the sample size for the industrial estates obtained was n= 18

A total of three hundred and twenty two (322) companies are located within the industrial estates in Lagos state. For homogeneity of data only building materials and plastic manufacturing industries were purposively selected. There are 54 of such Companies on the register, using the same Sediary equation 35 firms was calculated as the sample size which were selected randomly A total number of thirty five (35) companies was used for this sample**,** for uniformity and convenience ten questionnaires were administered to the maintenance staff in each of the 35 industrial Firms selected giving a total of 350 questionnaires. In order to determine the relationship and the degree of impact the various maintenance strategies have on the performance of building elements/components correlation analysis were computed for the variables and also a chi- square tests was carried out in order to test the level of significant between the variables. In order to determine the influence on type of maintenance strategy on the respondents' level of satisfaction with the physical condition of industrial facilities analysis of variance was computed between the variables.

IV. DATA ANALYSIS AND DISCUSION OF RESULTS

Table 2 shows the correlation analysis between reactive maintenance strategy and the performance of building elements and facilities. Spearmen correlation value for wall = 0.113. This shows that there is a weak positive correlation between reactive/corrective maintenance strategy the physical condition of the wall elements it also shows that only 11% of the wall elements is affected as a result of reactive maintenance strategy. The chi square tests calculated is 0.061 which is greater than 0.05 and therefore shows that there is no significant relationship between reactive/corrective maintenance and the physical condition of the wall.Specimen's correlation has R. value of Roof =0.240, this means that there is a positive correlation between reactive maintenance strategy and the physical condition of the roof, but the relationship is weak. It also shows that only 24% of the performance of roof element was as a result of corrective/reactive maintenance strategy. The chi-square calculated is equal to 0.006 which is less than 0.05 and therefore means that there is a significant relationship between reactive maintenance strategy and the roof performance.

Spearman correlation has R value of floors= 0.142. This shows that there is a weak positive correlation between reactive maintenance and the physical condition of the floor. it also shows that only 14% of the performance of floor elements were as a result of reactive maintenance strategy. The Pearson chi-square values is 0.83, which is greater than 0.05 (0.83>0.05) and shows that there is no significant relationship between reactive maintenance strategy and the physical condition of the floors. Windows/doors spearman correlation R value = 0.257 which means that there is a weak positive correlation between reactive maintenance strategy and the physical condition of the windows/doors. It also means that only 26% of the performances of windows /doors elements were as a result of reactive /corrective maintenance strategy. The chi-square value is = 0.001 which is less than 0.05 (0.001<0.05) which is shows that there is a significant relationship between reactive maintenance strategy and the physical conditions of the windows and doors.

Spearman correlation R value of electrical fittings= 0.276 which means that there is a weak positive correlation between reactive maintenance and the physical conditions of electrical fittings. it also means that 28% of the performance of electrical fitting is as a result of the maintenance strategy used. The chi-square value equal 0.000 which is less than 0.05 (0.00<0.05) means there is a significant relationship between reactive maintenance strategy and the physical condition of the electrical fittings.The spearman correlation R value of plumbing fittings and appliance = 0.227 which show a weak positive correlation between corrective maintenance and the performance of the plumbing service. It equally means that only 23% of the performance of plumbing services were as result of reactive maintenance strategy. The chi-square value equal 0.003, which is less than 0.005 (0.003 <0.005) mean that there is a significant relationship between reactive maintenance strategy and the performance of the plumbing services in the buildings.The correlation R values of the Air-Conditioning Units= 0.359, which means a weak positive correlation between reactive maintenance and the performance of the air conditioning units/. It equally shows that only 36% of the performance of the air-conditioning units was as a result of reactive maintenance strategy. The Pearson chi-square values 0.000 at 95% which less than 0.005.

This means that there is a significant relationship between the reactive maintenances and the performance of the air conditioning of units. The spearman correlation R value of the driven equipment = 0.32, this means that there is a weak positive correlation between reactive maintenance strategy and the performance of the driven equipment. it also shows that only 32% of the performance of the driven equipment is a result of reactive maintenance. The chi-square value is 0.000 which is less than 0.005; it means that there is a significant relationship between reactive maintenance and the performance of the driven equipment.The spearman correlation R value of generators = 0.40 which means that there is a weak positive correlation between reactive maintenance and the performance of the standby generators. it equal means that 40% of the performance of the standby generators were as a result of reactive maintenance strategy. The chi-square value is 0.00 which is less than 0.05. It shows that there is a significant relationship between reactive maintenance strategy and the performance of the stand-by generators.

The spearman correlation R value of sewage disposal systems = 0.30 which means that there is a weak positive correlation between reactive maintenance strategy and the performance of the sewage disposal systems. It equally shows that only 30% of the performance of the sewage disposal system is as a result of the maintenance strategy used. The chi-square values is 0.00 which is less than 0.05 this means that, there is a significant relationship between reactive maintenance and the physical condition of the sewage disposal systems.The spearman's correlation R value of the drinking fountains = 0.354which means a weak positive correlation between reactive maintenance and the performance of the drinking fountains. It also shows that only 35% of the performance of the drinking fountains was as a result of the reactive maintenance strategy. The chi-square value = 0.000 which at 95% confidence. Limit, which is less than 0.05 It means that there is a significant relationship of the performance drinking fountains and reactive maintenance strategy. Table 3 shows the correlation coefficient R values and chi-square values for planned preventive maintenance and the physical conditions of the building elements /components. The R values of the physical condition of wall = .135, ROOF = -0.34, floor = .116, electrical fittings = -0.37, plumbing =-0.92 Air condition units = -.028, Driven equipment = <.011. This means that there is a weak negative correlation between planned preventive maintenance and the physical conditions of the above mentioned building elements /components. The R values of the physical condition of the remaining Building elements /components of window/door = .010, fire safety = .084, motor = .088, generator = .041, sewage disposal system s= .048, drinking fountains = .064. This means that there is a weak positive correlation between the planned preventive maintenance strategy and the physical conditions of the building elements/components mentioned above. The result reveals that in all the elements /components, not up to 15% of their physical condition was as a result of planned preventive maintenance strategy. Only the chi square values calculated for motors, and air-conditioning units were significant for this maintenance strategy.
The implication is that most of the industrial Firms sampled rate of adoption and usage planned preventive maintenance as low and as a result could not have much impact in the physical conditions of their facilities.

Table 4 shows the R values of the spearman correlation between the condition-based maintenance strategy and the physical condition of the building element/components the R values obtained show that there is virtually no correlation between the variables and not up to 8% of the building element /component were as a result of condition based maintenance strategy. This is so because the percentage of industrial firms using condition based maintenance strategy were found to be low and as such could not have impact on the performance of the facilities.

Analysis of Variance (ANOVA) of type of maintenance strategy and the respondents level of satisfaction with the physical condition of industrial facilities.

Table 6 shows the result of analysis of variance (ANOVA) computed between types of maintenance strategies and the respondents' level of satisfaction on the performance of their facilities .The result shows that there is no significant relationship between the types of maintenance strategies and the respondents' level of satisfaction with the physical condition of their facilities. This means that the types of maintenance strategy currently used in the maintenance of industrial facilities in the study area had no significant influence on the performance of the facilities.

V. DISCUSSION OF FINDINGS

In order test for the relationship and the degree of impact between the type of maintenance strategy adopted in an organization and the physical condition of industrial facilities, spearman's correlation coefficient was calculated between the variables. The finding reveals that in all the case of reactive maintenance strategy, that there is a weak positive correlation between reactive maintenance and the performance of the industrial facilities.

The R values for reactive maintenance and the physical condition of the structural elements of the building (foundation, walls beam and column) = 0.113; which mean a weak positive correlation, but the chi-square value = 0.061 >0.05 at 95% confidence limit this means that although there exist a weak relationship between reactive maintenance strategy and the structural elements of the building, that the relationship is not significant.. The spearman's correlation (R value) for reactive maintenance strategy and the physical condition of the roof is 0.240, meaning that there is a weak positive correlation between reactive maintenance and the roof condition. The result also shows that only 24% of the physical condition of the roof was as result of reactive maintenance strategy. The Chi-square value for drinking fountain = 0.00< 0.05. The chi square values computed between reactive maintenance strategy and the physical condition of the walls = 0.061, and floors = 0.83, both values were greater than 0.05 which mean that there is no significant relationship between reactive maintenance strategy and the physical conditions of the walls and floor. But in all other cases the chi square values were less than 0.05 <0.05 which shows that a significant relationship was established between reactive maintenance strategy and the physical condition of industrial facilities. The finding also revealed that reactive /corrective maintenance strategy was the most widely used maintenance strategy in all the industrial firms sampled.

The finding reveals that in all the facilities not up to 15% of their performance were as a result of planned preventive maintenance (PPM) strategy and only the chi square values calculated for manufacturing plant and air-conditioning units were significant for the PPM strategy. The PPM strategy could not have much impact on the performance of the industrial facilities probably because the adaptation and usage of the PPM strategy were rated low among the industrial firms sampled. The finding reveals that there was no correlation between condition-based maintenance strategy and the physical condition of industrial facilities. This could be explained to be due to the very low adoption and usage of the condition based maintenance in the industrial firms sampled.

VI. CONCLUSION

The study was focused on appraising the state and maintenance of industrial facilities, maintenance strategies adopted, and the impact of the strategies on the performance of the facilities. The most widely maintenance strategy used by maintenance department of building manufacturing and plastic industries in Lagos state was reactive maintenance.A weak positive correlation was established between maintenance strategy adopted and the performance of industrial facilities. The contribution of the study for the literature of industrial facilities maintenance is both methodological and theoretical. The methodological contributions involve efforts at establishing a relationship between maintenance strategy and the physical conductions and performance of industrial facilities. The research is also providing reliable data on the state of industrial facilities and the impact of maintenance strategies on the physical condition of the facilities. While the theoretical contribution lies in establishment of link between of maintenance staff and their attitude toward maintenance of facilities, and preference in the choice of a particular maintenance strategy. Some of the findings of the study provide possible directions for further research. The study only examined facilities maintenance management strategy in the building and plastic manufacturing firms. Further research should be carried out in the following areas:

[1] It is worthwhile to look into maintenance management strategy in other industries such as food process, breweries etc. This is to establish if there are differences in the performance and therefore compare the opinions of the maintenance staff on the state of physical conditions of the facilities and maintenance strategies adopted.

[2] Further research work can be carried out on facilities maintenance management practice of industrial plant and machinery. This was not considered as part of the research work due to engineering professionalism involved.

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Table 1. Industrial estates in Lagos state

S/N	Location	Year of Establishment	Size in Hectares
1	Apapa	1957	100
2	Matori	1958	120
3	Ikeja	1959	180
4	Ilupeju	1962	110
3	Ijora	1965	160
6	Iganmu	1965	80
7	Oshodi/Isolo	1968	120
8	Amuwo-odofin	1969	200
9	Ogba	1969	150
10	Oregun	1981	100
11	Agidingba (CBD)	1969	97
12	Gbagada	1958	50
13	Ikorodu	1976	1,582.27
14	Surulere	1981	20
15	Badiya	1958	15
16	Oyadiran/Yaba	1970	20
17	Ilasamaja	1971	60
18	Lagos South-West	1972	317.04
19	Kirikiri	1981	30
20	Abesan/Ipaja	1981	100
21	Akowonjo	1976	50
22	Oko-afo/Ilogbo	1981	-

Source: [28]

Table 2. Correlation coefficient and the chi square of Corrective Maintenance values and the building elements/facilities sampled.

Physical condition of element/components	R values	Chi-square values
Walls	0.113	0.610
Roof	0.240	0.006
Floors	0.142	0.830
Windows/doors	0.257	0.001
Electrical fittings	0.276	0.000
Plumbing	0.227	0.003
Fire safety equipment	0.115	0.620
Motor	0.356	0.001
Air condition unit	0.359	0.000
Driven equipment	0.320	0.000
Generators	0.400	0.000
Sewage disposal systems	0.300	0.000
Drinking fountain	0.354	0.000

Table 3. Correlation coefficient and the chi square of PPM values and the building elements/components sampled.

Physical condition of element/components	R values	Chi-square values
Walls	-.135	.0.98
Roof	-0.34	.934
Floors	-.116	.030
Windows/doors	.010	.297
Electrical fittings	-.037	.523
Plumbing	-.092	.180
Fire safety equipment	.084	.582
Motor	.088	.002
Air condition unit	-.028	.001
Driven equipment	-.011	.017
Generators	.048	.011
Sewage disposal systems	.149	.040
Drinking fountain	064	.009

Table 4. Spearman correlation coefficient and chi-square values of condition based maintenance (CBM) and the physical conditions of the Building elements /components.

Physical condition of element/components	R values	Chi-square values
Walls	.036	.263
Roof	.060	.324
Floors	-.051	.077
Windows/doors	-.020	.027
Electrical fittings	-.092	.017
Plumbing	-.125	.005
Fire safety equipment	.032	.413
Motors	-.060	.475
Air condition unit	-.170	.016
Driven equipment	-.164	.001
Generators	-.120	.050
Sewage disposal systems	-.068	.003
Drinking fountain	-.099	.000
Foundation	-.038	.392

Table 5. Spearman correlation coefficient and chi square values of time based maintenance strategy and the physical condition of the building elements /components.

Physical condition of element/components	R values	Chi-square values
Walls	-.064	0.015
Roof	.029	0.282
Floors	-.039	0.113
Windows/doors	-.010	0.000
Electrical fittings	.063	0.003
Plumbing	.021	0.254
Fire safety equipment	-.074	0.063
Motors	-.033	0.306
Air condition unit	-073	0.278
Driven equipment	-.017	0.000
Generators	-.023	0.001
Sewage disposal systems	.105	0.109
Drinking fountain	.060	0.104
Foundation	-.054	0.269

Table 6. Analysis of variance values (ANOVA) of type of maintenance strategy and the performance of industrial facilities as perceived by maintenance staff

Description	F	Significance
exterior wall condition	1.057	.393
interior wall condition	.670	.698
exterior wall finish condition	1.909	.070
roof condition	1.367	.221
window condition	1.125	.221
door condition	1.800	.089
structural condition	1.804	.088
electrical condition	.759	.622
fire safety	1.295	.254
rest infestation	1.466	.181
plumbing condition	1.792	.090
overall cleanliness	1.674	.117
Motors	1.846	.080.
driven equipment	1.875	.075
Generators	1.718	106