A Case Study: Construction Management Approach towards the Repair & Maintenance of Industrial Building

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Abstract – Information regarding this paper discusses the review of Repair and Maintenance of Industrial building. In the current scenario of industrial building research, repair and maintenance place a vital role as it serves important in industrial building. Industrial building and other structure have a certain useful life. In industrial building various defects are generated due to different causes e.g. in some cases defects are caused after the structure has been complete for the few years which results in shortening of life and strength of structure. We have visited and study the various defects occurred in "AAKAR M&DS" at Bhosari which is located at district Pune, state Maharashtra, India. Aim of the paper is to conduct literature review of different approaches to defining the building maintenance and repair. The major defects reported are discussed and suitable and economical solution for the particular defects is identify by a tradeoff between cost, lifetime, and adaptability of the solution.

Keywords- PLM, CMMS, Repair and Maintenance, Preventive Maintenance, Different Approach

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1. INTRODUCTION

Industrial building maintenance and repair have one of the biggest problems we are facing today. Maintenance it is work undertakes to improve every facility in every part of industrial building. It is the service and surroundings accepted standards and to sustain utility values of the facility. Objective of maintenance is to preserve in good condition building and services, when deterioration occurs due to any reason it is inevitable to restore it to its original standards, to make improvement whenever required. A good maintenance team has to ensure safety, efficiency and reliability.Repair is the process of restoration of broken damages, failed device, equipment, repairs. Some types of repair such as patching up of defects such as cracks and fall of plaster, repairing doors, windows, replacement of glass panes. Checking and repairing electric wire.

Maintenance, Repairs and operations involves maintaining, repairing and replacing if industrial, business, government and residential installations. In maintenance there are typessuch as preventive maintenance, corrective maintenance, Predictive maintenance. Building in disrepair or unsanitary condition, unauthorized building works are potential hazards to the public. In any industrial building many types of defects are occurred such as attack by pollutants, defects occurred in various forms and the different extends in all types of building , irrespective of age, use of unsuitable construction details, Natural deterioration defective concrete, or loose plaster in ceiling and etc. We find out all the above defects and their causes too. After findings the causes we will give preventive measures. Defects in building services installation such as water supply, electricity supply, fire services, lift and escalator, air conditioning or heating.

Now-a-days industrial building has many problems with repairs and maintenance. Many different techniques for investigation and repair for the various defects are available in the market. So, we will be suggest technical system which is efficient as well as reducing the time and low cost for repair and maintenance. There are different types of industrial buildings processing units such as collection unit, processing unit, manufacturing unit, packaging unit, storage unit, selling unit, etc.

Image of Industrial Building

2. REVIEW OF LITERATURE

2.1:- Albert H.C. Tsang (1998) :- Studied that a structure approach to managing maintenance performance developed from this premise. The measurement system features, balance scorecard composed of key component indicators. In this research paper BSC is used to informed employees of the strategy purchased by the maintenance functions to track the effectiveness of action plan.

2.2:- B.M.W. Horner M.A. E & Haram, A.K. Munns (1997) :- Studied thatthe financial support of the engineering and physical science research council is gratefully acknowledged. This method will help maintenance engineers and managers to reduce the cost of maintenance while preserving the safety, health and satisfaction of user.

2.3:- Melesse Workneh Wakjira & Ajit Pal Singh (2012) :-Studied that the purpose of this paper is to evaluate the contribution of total productive maintenance (TPM) initiatives towards improving manufacturing performance in Ethiopian Malt manufacturing industry. The achievements of Ethiopian manufacturing organizations through proactive initiatives have been evaluate critical TPM Success factor identified for enhancing the effectiveness of TPM implementation in the Ethiopian Context. TPM is a unique Japanese philosophy, which has been developed based on the productive maintenance concept and methodologies. Total productive maintenance is an innovative approach to maintenance that optimizes equipments effectiveness, eliminates breakdowns and promotes autonomous maintenance by operators through day to day activities involving total workforce. This study is done in the manufacturing sector at Asella Malt industry, Asella, Ethiopia, Africa and the value chosen are meant for justifying the research initiatives oniy.

2.4:- Iveta Pukite, Mg.sc., & Ineta Geipele & Prof. Dr. Oec (2016) :- Studied thatthe present paper examines the connection between building and property management and building management system. The main aim of maintenance is to protect a building at its preliminary stage and to retain the value of investments in the property. During the management process, owners of building have to resolve several issues, such as how to organize building management effectively and in compliance with the existing regulations. The aim of paper is to conduct a literature review of different approaches to defining building management and building maintenance which are examined in various scientific publications.

2.5:- Oleg Kaplinski (2013) :- Studied thatthe paper deals with economic and psychological aspects of the decision making process in the area of repair and maintenance. The issue presented in this paper can be encountered not only in the strategy of plumbing work implementation, but also in many examples within the realm of both small and large projects. It is relevant to investors and contract engineers.

2.6:- Kajol Mevawala &Liza Hirpara & Kavita Choski & Darshan Mehta (2016) :- Studied that the purpose of this paper is to justify the latest techniques, advanced materials and various requirements of repairing work to obstruct the deterioration which is necessary and economical than to reconstruct the building. After analyzing the problem of building, we can apply the appropriate repair methods like Guniting, Routng and Epoxy Injection.

2.7:- Darli Rodrigues Vieira &Paula Lavorato Loures (2016) :- Studied that the purpose of this paper is to present the Maintenance, repair and overhaul (MRO) and aeronautical industry literature review. As well as to provide insights related to MRO business models strategies. The analysis indicated there is a tendency of the market to build partnerships between stakeholders to expand market penetration. The concept “One stop shop” was identified, meaning that the customer is looking for only one place to overhaul the aircraft.

2.8:- Cheong Peng & Au Yong &Azlan Shah Ali & Shirley Jin Lin Chua (2016) :- Studied thatpaper reviews the implementation of preventive maintenance strategy, routine maintenance in specific. The research examines the maintenance issues in construction industry, specifically in residential building. The study will focus on two aspects, which are routine maintenance of essential facilities and services and value-added facilities and services.

2.9:- S. Raja Subramaniam (2016) :- Studied thatpaper provides a comprehensive study of repair and rehabilitation of heritage buildings. Repairs and Rehabilitation is defined as the process of achieving the original state of structure when it undergoes any sort of defects or deterioration or destruction. This paper delivers its usefulness to those who as an

objective of doing Repair and Rehabilitation in a Heritage Building.

2.10:- Jorge M. Simoes (2013) :- Studied thatthis literature review examined issues relevant to the different facets of maintenance activities, resources, measures, and measurement in manufacturing organizations. Based on the findings of the study, it is concluded that the area of maintenance performance and management is in need of more future systematic research efforts aimed at solidifying theoretical constructs and promoting the utilization of more practical applications.

2.11:- N. Ahzahar & N. A. Karim & S. H. Hassan & J. Eman (2011) :- Studied thatthe aim this research paper is to identify contribution factors to building defects and failures, which a frequently occur in construction project especially in Penang area in order to minimize time and cost involved. This study is succeeds in identifying the common contribution factors of structural defects and failures in construction project. In this research paper methodology such as conceptualization, literature review, questionnaire, data analysis, result, analysis and discussion. Based on the result of the data analysis for building defects and failures, it was found that the low quality of construction material is most common factors that lead building defects and failures. It is recommended to all parties to promote and practice ethical conducts in their project to minimize other contribution factors to building defects and failures.

2.12:- Alcinia Zita Sampaio & Augusto Gomes (2014) :- Studied thatthe main objectives of this research paper is the development of technological tool to support the maintenance activity of buildings, with resort to new information and visualization technologies. In this paper the presented VR applications support the inspection activity of roofs, facades and painted interior walls and promote the use of IT tools with advanced graphic and interactive capabilities in order to facilitate and expedite the maintenance process. The information about pathologies, cause and repair methods, collected from a specialized bibliography, has been organized in such a way as to establish each model database to be used as a base for the drawing up of a tool to support a building maintenance. The main aim of the application is to facilitate the maintenance enabling the rapid and easy identification of irregularities, as well as the possible prediction of their occurrence through the available inspection record.

3. DEFECTS IN INDUSTRIAL BUILDING

1. Defective concrete, loose in ceilings.
2. Water seepage from external wall, window, roof or from ceilings.
3. Structural cracks in column and beam.
4. Non-structural cracks in plaster and other finish.
5. Defective external wall finish / mosaic tiles.
6. Structural cracks in wall.
7. Defect due to design failure.
8. Defect due to construction failure.
9. Defect due to material failure.
10. Lack of supervision.
11. Climatic condition.
12. Chemical reaction.
13. Manufacturing defects.
14. Patterned cracks.
15. Roof defect.

4. INDUSTRIAL BUILDING MAINTENANCE APPROACH

1) Creating the diagnostic maintenance, that led lately to the conditioned maintenance. It is about applying thetechniques of non-destructive control, and the vibrations control, fluids, analysis, etc.

2) Taking into the considerations the economic aspects in defining the maintenance's attempt. Any equipment at which an accidental failure or a decline of the functioning parameters determines in the significant manner a decrease in the production's quality or quantity is considered a "critical" one. The concept of "failure cost" appears and indirect financial incidence of the activity of the maintenance is considered. But it is not enough just to consider to economic aspects when the maintenance actions are decided (the cost equipment non efficiency, the non-maintenance cost). It's also necessary to evaluate the risk and probabilities of the equipment malfunctions.

3) Maintenance is associated with various management processes, such as safety,the environment and quality management. In the case of managing safety and environmental impacts in industry, the role of successful and effective maintenance is important because of very high demands and expectations for retaining a system inherent safety.

4) Reliability is also important for environmental safety since failures and accidents in high-risk industries can cause major environmental impacts. This sets high requirements on maintenance in such plants because of the essentialrole it has in supporting production management by ensuring trouble-free production.

5) Furthermore, the link between maintenance and product lifecycle management (PLM) is strong, as maintenance is a crucial part in PLM. Among PLM systems that concern maintenance during product and system design phase, certain tools and systems have been developed for maintenance management during the use of a system. An example of such a system is CMMS (Computerized Maintenance Management System), which, among other things, helps to control permits needed in maintenance tasks, machine-specific service programs, and inventorydata on spare parts, and tools.

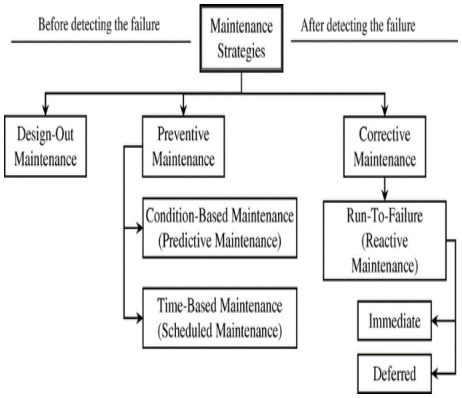

Fig. Maintenance Strategies

5. CONCLUSION

This paper provides a comprehensive study of repair and maintenance of industrial building the existed problem and its reported & give the final solution for this existing problems. The maintenance and repair work is becoming necessary to ensure the serviceability and safety of the constructed facility. According to our study & data collection from industry were analyzed to identify the common defects, problems. Hence this paper delivers its usefulness to those who as an objectives of doing a repair and maintenance of industrial building.

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