Improvement in Material Handling in the Cement Industry: A Case Study

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Abstract— Cement industry is an important role for rapid growth and development of the construction activities. To provide higher production and beneficial for company incomes and health and safety program conducted (no one can harm during the cement production activity).The purpose of this project to proper handling of materials without any disturbances and injury. Health and safer work practices, to proper control the material handling process. When raw material is transfer from one place to another place during the transportation process in the cement industry activities. To minimize the risk and improvement in material handling process by using risk assessment methods, proper record keeping will also maintained to overall production. Five step to conduct risk assessment to proper control the handling of materials and proper protection, safe work practices of materials. Following are steps to conduct to overall production process. Look at the hazards, identification of hazards, proper analysis, estimation of hazards, proper evaluation of risk to proper handling of material and to minimize the risks, recordkeeping will also maintained, proper documentation is necessary to control over all material handing process, suggestion regarding to proper implementation and to increase the efficiency of production phases and also provide safety control measures to provide safe work handling practices by using five basic steps of risk assessment procedure to minimize the risk and improvement in material handling process.

Key words: Safety, Material Handling, Risk Assessment, Safety in Manufacturing, Safety Management

I. INTRODUCTION

From limestone loading (mining industry) to dispatch of cement. Various hazards and risk take place by poor handling of materials and equipments. During the transportation process, carelessly to handling of material they create huge problems affects human health and to decrease the productivity. Transportation of materials from one place to another place to proper equipment control and day to day safe work practices beneficial for industrial purpose.

A. Aim of project –

1) Eliminating or reducing handling
2) Improvement the efficiency of handling
3) Make the correct choice of material handling equipments.

B. Process

Major operation are carried in the cement plant:-

1) Crushing of raw materials
2) Storage section and proper blending of raw materials
3) Raw mix preparation
4) Grinding of raw materials and proper homogenization process.
5) Material pyro- processing
6) Cooling and storage of clinker activities
7) Grinding with clinker, gypsum and fly ash
8) Storage and packing of cement

C. Factors affecting material handling equipments are as follows:

1) Problem of production activities.
2) Human activities and human element involved
3) Capabilities of handling equipments

D. Various types of material handling equipments:

1) Conveyors (transferring of materials)
2) Cranes, elevators and hoisting (loading of materials)
3) Industrial trucks (material transportation system)
4) Auxiliary equipments

E. Control the production activities to increase the performance:

1) Movement
2) Quantity
3) Time
4) Control

F. Advantage of good flow pattern:

1) Production efficiency increases.
2) Better utilization of floor space.
3) Handling activities simplification way.
4) Better equipment utilized.
5) Process time should be reduced.
6) Process inventory should be reduced.
7) Efficient utilization of work space.
8) Product damage should be reduce.
9) Walking distance should be reduced.
10) Minimize accident hazards.
11) Efficient layout maintain.
12) Proper and faster supervision required.
13) Production flow be smooth.
14) Better housekeeping.
15) Legal requirements from the company taking action.
16) Improving scheduling procedure.
17) Logical work sequencing activities performed.

G. Hazard faced in transportation of materials

1) Untrained drivers- Drivers are not properly trained they are carelessly in driving position.
2) Inadequate brakes- Lack of maintenance possibility.
3) Rough access roads- Levelling of road is not proper.
4) Lack of visibility- Lack of all-around visibility from the driving position.
5) Exposure to dust- when transferring of material from one place to another place.
6) Material handling equipment failure- during the transportation process material handling tools and equipments failure.
7) Unsuitability- unsuitable loading of material.

H. Hazard faced in material storage and material transportation system

1) Transportation problems- carelessly from vehicle driving position.
2) Unclean platforms- To do work in presence of unclean surfaces high risk should be created by poor handling of raw material.
3) Exposure to dust- Transferring of material as well as storage of material excessive dust create major problem.
4) Poor supervision required- Travelling over and under the transportation system without any supervision passages

I. Methods

1) Look at the hazards
2) Risk identification
3) Consequence analysis
4) Estimation
5) Evaluation
6) Record and finding

By poor handling of raw materials various types of risk as follows cause major and minor accidental problem

Likelihood	High	Risk Medium
Consequence	Low	
Likelihood	Low	Risk Medium
Consequence	High	
Likelihood	High	Risk High
Consequence	High	

Five steps to conduct risk assessment on the basis of material handling.

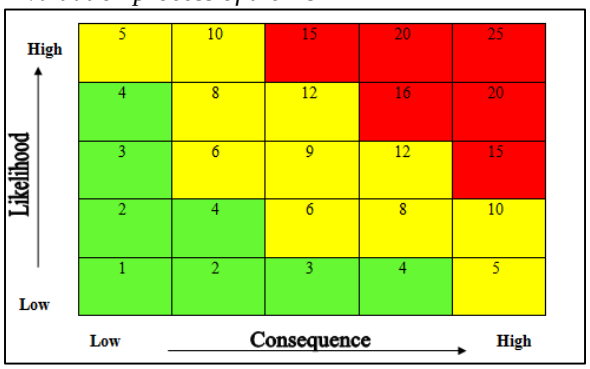
1) List the work task
- a) Location
- b) People
- c) Work activity
- d) Equipments

2) Identify the risk
- a) What are the hazards?
- b) Who might be harmed?
- c) How might they be harmed?

3) Estimate the risk
- a) How likely is that something go wrong? (possibility of risk)
- b) Which type of serious outcome be?

Risk= Likelihood × Consequence

Elimination
Substitution
Isolation
Engineering
Administration



4) Evaluation process of the risk

1-4 Low risk (It is acceptable acceptable)
5-14 Medium risk (tolerable for little work)
15-25 High risk (Take immediate action required)

5) Record and findings
- a) Location, activity and equipment
- b) Being assessed
- c) Hazard and risk levels by proper evaluation
- d) Risk controls
- e) Assessor details
- f) Date and time
- g) Review date

Record is very beneficial for our future course of action. Companies past record to proper maintain to overall production process. To see the past record data such as safe and unsafe acts, accidental problems etc. In present some new techniques to improve past records.

J. Control Measures

1) Safety precautions
2) Standard operating procedure maintained
3) Personal protective equipments
4) Full body harness maintain
5) Legal requirements
6) Records and findings

II. LITERATURE REVIEW

Witt, Clyde explains that safe work practices to proper controls tools and equipments. Transportation of materials from one place to another place be safe and reliable.

Gould, Les explains that in cement manufacturing process various take place when poor operating condition and unsafe acts handle in working condition create health related problem and also to decrease the productivity.

Kulweic Ray explains that to manage various safety precautions, safety control measures, legal requirements and proper documentation process is necessary to provide suitable output.

Hussain, I., explains that to minimize the risk and improvement in material handling process by using PPE, administration controls, engineering, isolation, substitution and elimination.

Tichon, J., explains that utilization of best resources, proper planning is necessary to control the activities, utilization of better equipments to control the material handling in cement industry, better housekeeping to proper control the material handling process.

Paquet, v., punnett explains that risk assessment on the basis of material handling procedure such as

identification, evaluation and proper estimation and documentation process managed to provide work practices in operating condition of tools and equipments.

III. RESULT

Suggestions regarding to provide safety control measures, safety precautions, to maintain documentation process.
Suggestion regarding proper review is necessary from time to time to proper control the production process.

IV. CONCLUSION

In cement industry handling of materials should be suitable manner to minimize the risk and implementation of cement manufacturing process. Proper handling of tools and equipments and apply safety control measures to proper control the handling of material and also provide best safe practices to increase the productivity.

V. FUTURE SCOPE

The management to adopt best practices to remove the waste of the overall process. Proper maintenance is required to increase the productivity and provide safe work practices for handling of materials.

ACKNOWLEDGMENT

I pay my sincere thanks to Acc jamul team group to permit me for visiting for your company for my major project work. I sincerely thank them for their numerous suggestions and commend their patience, Helpful for my major project work beneficial for my future.

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