Study of Hazard Identification And Safety Management In Underground Metro Construction Project : A Case of Pune Metro

Ms. Sayali D. Bhadane[1] , Prof. Milind M. Darade[2], Dr. Nagesh L. Shelke[3]
[1] Dept of Civil Engineering
[2]Asst. Professor, Dept of Civil Engineering
[3]HOD, Dept of Civil Engineering
[1, 2, 3] Dr. D.Y.Patil School Of Engineering & Technology, Lohegaon, Pune.

Abstract- *In housing industry largest range of injuries compared to alternative industries. Therefore, reducing accidents and determinative risks area unit vital. one among the essential steps for construction safety management is hazard identification.*

This paper explains regarding the foremost vital factors of subway tunnels safety and importance of safety and security to boost the more leisurely services in subway tunnel and subway stations.

Keywords- Risk assessment, Hazard identification, Safety Management.

I. INTRODUCTION

In gift era for any business to achieve success it ought to meet not solely the assembly needs however conjointly maintain the protection standards. the development business there area unit wide selection of hazards in its varied operational areas. In India the development business has contributed associate degree calculable US$ 308 billion to the National GDP in 2015-16.

Hazard identification facilities and risk management is systematic approach to guard the health and minimize danger to life, property and atmosphere. It includes the method steps to spot hazard associated with materials, operations and conditions. Assess the chance level of the hazards and apply or recommend the doable remedies and corrective actions to cut back the chance. Rail transport systems at intervals the urban specific conditions, most safety special travel arrangements for the implementation of activities need.

a daily safety management system approach to safety, at the side of systematic and specific comprehensive processes for managing risks area unit secure. Like all management systems, the safety management system for achieving safety goals, designing and performance mensuration was created. Safety management system is that the bone of a corporation.

1.1 Purpose and Objectives of the Research-

1. To review hazard identification and risk management for effective dominant and observation of underground subway line Pune
2. To provide effective management for safety.
3. To study steps of risk management for future requirements.

II. RELATED WORK

Vishwas H S (2017) provides report on HIRA applied within the construction website of subway railway line project at Hyderabad.It includes the method steps to spot hazard associated with materials, operations and conditions. Assess the risk level of the hazards and apply or recommend the doable remedies and corrective actions to cut back the chance.

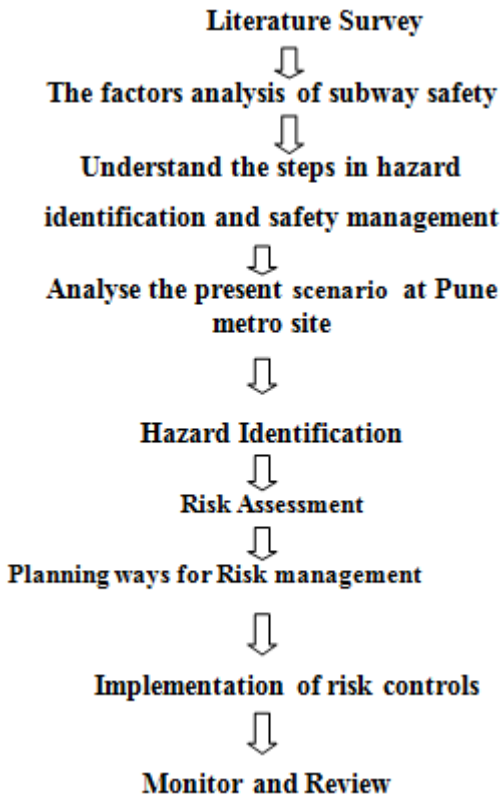
G.Poovizhi (2020) provides info regarding to construct a brand new style of model for risk safety management in subway rail comes, to review the prevailing risk safety management system and to spot the risks that occur throughout construction and to make, implement, and verify the potency of the model for safety within the construction of subway rail comes.

Zhenhua Luo (2019) Considering the 2 objectives of guaranteeing the sleek operation of the prevailing terminus and also the safe construction of the new terminus, he analyzes the doable safety risk factors throughout the development of the new terminus close-attached undercrossing the prevailing operational station and identifies seventy five preliminary risk factors by suggests that of literature review and on-site investigation.

Vahed Ghiasi (2010) explains regarding the foremost vital factors of subway tunnels safety and importance of Safety and security to boost the more leisurely services in subway tunnel and subway stations.

Rehan Masood (2011) provides directions to project managers to develop safety culture through streamlining of their perceptions,by giving priority to safety and by enhancing the supervising of effective safety management systems.

2.1 METHODOLOGY



The basic procedure for job safety analysis is as follows:

1. SELECTION- choose the duty to be analyses.
2. DIVIDE- Break the duty into its elements elements in orderly and successiveness of job steps.
3. ANALYSIS-Critically observe and examine every part of the duty to work out the chance of accident.
4. DEVELOPMENT OF management MEASURES-Develop management live to eliminate or cut back the chance of accident.
5. IMPLEMENTATION- Formulate written and safe systems of labor and job safety directions for the duty.
6. MONITOR AND MAINTAIN-Review safe systems of labor and job safe practices at regular intervals to confirm their utilization.

2.2JOB SAFETY ANALYSIS RECORD (Evaluation in Construction)

- Job Title:
- Department:
- Date of job analysis:
- Time of job observation:
- Analyst
- Description of Job:
- Accident Experience:
- Maximum Potential Loss:
- Legal Requirements:
- Relevant codes of practice/Guidance Notes /Advisory Publication:
- Sequences of job steps
- Risk known
- Precautions suggested
- Suggested safe system of work:
- Suggested review date:
- Suggested job safety instructions:
- Suggested coaching program:

2.3 Sample Job Safety Analysis

a. Activity- Excavation

Hazards- contact with electrical cable, pipeline.
Risk Control Measures- collect info about the underground utilities and check for the identical before excavation.

b. Activity- concreting

Hazards- physical contact with wet concrete generally could harmful.
Risk Control Measures- use safety assesories, use safe techniques.

c. Activity- use of crane for loading

Hazards- failure of crane, unbalanced loading
Risk Control Measures- seasoned supervisor.

III. CASE STUDY

In early 2010, Pune Municipal Corporation (PMC) approved a proposal to create a underground rail system in Pune supported a close Project Report (DPR) ready by the

urban center underground Rail Corporation (DMRC) in 2009. The proposal at the start approved by PMC was for 2 corridors (I and II) of underground rail. afterward, because of a delay in inbound at AN agreement with neighboring Pimpri Chinchwad relating to passageway I, PMC determined to proceed with passageway II that is entirely among its jurisdiction.

1) Line I- the road I of the pune underground covers a distance of sixteen.65 klick running between pimpri Chinchwad to Swargate(nine elevated stations and vi underground stations).Recently PCMC approved the elaborate Project Report for extention of route to nigdi(4.5km).
2) Line II- the road II of the pune underground can run between Vanaz and Ramwadi (14.7km, sixteen stations fully Elevated)
3) Line III- the road III of pune underground created in two phases- Hinjewadi to Balewadi and Balewadi to Shivajinagar

The Pune underground underground line runs from Shiwajinagar to Swargate(98.2 km).

Identification of Risks at underground line during construction

Excavation of Tunnel
Launching of TBM (Tunnel boring machine)
collection of phase
Special conditions and procedures
Arrival of TBM
Grouting
Pilot excavation
Mucking
Shaft construction

3.1. A sequence of Activity for Tunnel Works

The sequence of activities for tunneling works given within the following steps casting yard

- Segment casting
- Preparation work of launching shaft
- Electrical offer to TBM
- Preparation for launching TBM
- TBM collection
- begin excavation by TBM
- Muck disposal from locomotives
- Muck disposal by victimization framework
- Tunnel created

3.2 General needs

- Escape Routes
- Fire and attention Points
- Electrical Sub Stations
- Control and Communication Purpose
- Tunnel Access Points
- Emergency Exit
- ventilation

IV. CONCLUSION

In this paper study of hazard identification and safety management for underground construction with correct steps careful effectively. And apply it for Pune underground line. It complete that Risk Safety management in construction project management is systematic and correct thanks to establish,analyse and avoid risk to realize project purpose and objectives. attributable to safety management in project improves success rate of project ,and hazard reduction may be achieved. thus Construction firms that manage risk effectively and with efficiency get edges of monetary savings, and bigger productivity.

REFERENCES

[1] Vishwas H S, Dr. G D Gidwani, presented a "Hazards Identification and Risk Assessment in Metro Railway Line Construction Project at Hyderabad" (IJERT) ISSN: 2278-0181 Vol. 6 Issue 08, August – 2017
[2] G.Poovizhi, S.Manoj, D.Ambika, V.Santha Rubini, V.Nandhini, S.Dhinu Priya presented a "Risk Safety Management in Construction of Metro Rail Projects"International Journal of Advanced Science and Technology Vol. 29, No. 1, (2020), pp. 1562 - 1571.
[3] Zhenhua Luo , Li Zeng , Haize Pan, Qijun Hu , Bo Liang, and Jianqiang Han presented a "Research on construction Safety Risk Assessment of new Subway Station Close-Attached Undercrossing the Existing Operating Station,China, 18 July 2019.
[4] Vahed Ghiasi, Samad Ghiasi, Husaini Omar, Behroz Ebrahimi ,Mohammad Ghiasi presented a "A Review of Metro Tunnel safety Parameters and Role of Risk management, Tehran Metro " March 2010.
[5] Rehan Masood, Rafiq M. Choudhry, Zainab Riaz, Salman Azhar and Jimmie Hinze presened a "Role of Managers in Establishment of Construction Safety Culture" August 2011.