

**IDENTIFICATION AND RANKING OF RISK AND SAFETY FACTORS AT
AGGREGATE CRUSHING PLANT THROUGH IMPI METHOD**RONITKUMAR C PATEL¹, PROF. JAYDEVBHAI J BAHVSAR², PROF. AMITKUMAR N BHAVSAR³¹Student of final year, M.E. (Construction Engineering & Management), B.V.M. Engineering College, Vallabh Vidyanagar, Gujarat, India²Associate Professor, Civil Engineering Dept., B.V.M. Engineering College, Vallabh Vidyanagar, Gujarat, India³Associate Professor and Research Scholar, Civil Engineering Dept., B.V.M. Engineering College, Vallabh Vidyanagar, Gujarat, India

Abstract—Risks is important impact on aggregate crushing plant in principal stage. Risk management is a process which involves identification of risks, valuation making qualitatively and quantitatively, use a suitable method for handling risks, after risk control by monitoring. This study recommends to apply the risk and safety management technique which added well known procedures for all types of hazards most likely to happen during working crushing plant. In crushing plant many risk occur like as during blasting work, blasting material stocking, equipment and machinery operating and maintenance, etc. And safety hazards like inhalation of fumes smokes and dust in the quarry site cause sicknesses to third party, people and workers who living close to quarry sites and the direct environment. Many plants regularly start a risk and safety management technique for improving the performance, decreases the chances of accident and growth profits with good quality. Then use IMPI method which gives importance index for risk sub factors and finally we get result.

Key Words—Risk and Safety, Crushin Plant, Agregate

I. INTRODUCTION

Definition of risk is a state of uncertainty where some possible outcomes have an undesired effect or significant loss. Uncertainly is meaning that the lack of certainly due to limited knowledge that it is impossible to state the outcome exactly, perhaps, more than one possible outcome happens. Risk management is the discipline of identifying, monitoring and limiting risks. IRisks can come from accidents, natural causes and disasters as well as deliberate attacks from an adversary.

A quarry is a bulky payment of rock such as granite which is use in construction. In several area, the term quarry is used interchangeably for two types of aggregate quarry mines, from which rubble and particulate matter are removed, and measurement stone quarries from which large amounts of pieces of rock are mined for use in building. Risk exists in all the extractive activities especially in the mining and quarrying industries. In the quarrying industry most of the happenings do outcome to health hazards which do establish some injuries to workers through accidents or poor protection resulting from incorrect risk management. The dust in the quarry site cause a lot of harmful to worker third parties and people who live close to quarry sites in GUJARAT.

II.OBJECTIVES OF THE STUDY

This paper has an objective to draw attention towards major risk and safety factors at crushing plant which works in central Gujarat. And also providing implementation to crushing plant so that we can reduced risk and accident and have better safety precautions.

III. RESEARCH METHODOLOGY

The data collection to determine the most important risk and safety factors at crushing plant through a survey by explorative questionnaire to the respondents involved in daily activities of crushing plant firms in central Gujarat region of India. The questionnaire was designed so that respondents can give the rank to their answers based on the Likert scale. The analysis of these data was done by Importance Index (IMPI) method using in Microsoft Excel.

IV. DATA COLLECTION

A total number of 40 respondents were surveyed from Central Gujarat region of India. A ranking of the factors was achieved from the Importance Index (IMPI) method.

V. DATA ANALYSIS BY IMPORTANCE INDEX (IMPI) METHOD

The data collected was manually analysed by the IMPI method with the help of which a decimal figure for each factor is obtained which is known as its Importance Index method. This index is used to rank the factors. Total 42 factors were analysed using IMPI Method and ranked as shown in Table 1.

TABLE 1: - RANKING OF MAJOR RISK AND SAFETY FACTORS AT CRUSHING PLANT

Risk and Safety Factor	IMPI	Rank
Plant Cost	27.313	1
Taxes Changes	26.508	2
Blocked Certificate	26.508	3
Storage and Handling	26.367	4
Uncertainty of Blasting Material Availability	25.875	5
Difficulties In Disposing Equipment	25.195	6
Incomplete Design	25.000	7
Uncertain Productivity	24.664	8
Co-ordination with sub –ordinates	23.344	9
Non-availability of operators for equipment	23.125	10
Primarily Planning	21.250	11
Poor Jointing Machine Parts	20.816	12
Poor Communication	20.719	13
Licenses	19.820	14
Operator	19.750	15
Information	19.656	16
Challenging industrial Relation	19.656	17
Hand Tools (Noise, electrocution, Lighting)	19.391	18
Improper Roles of Staff	17.773	19
Insufficient Site	17.672	20
Deposit Cost of Mining	17.344	21
Physical (Manual Handling, Height, Machinery, Injury, Electricity)	17.016	22
Equipment And Tools	16.539	23
Royalty	16.406	24
New Technology	16.113	25
Biological (Cancer, skin problems, chest problems)	15.996	26
Trees plantation after closed mining area	15.809	27
Non-availability of maintenance facility for equipment	15.742	28
Govt. Policies	15.586	29
Law	15.586	30
Change in Requirement Stock	15.500	31
Insufficiency of equipment availability	15.406	32
Partnerships and Agents Issues	15.234	33
Monitoring	14.555	34

Act of God	14.555	35
Insufficient Skill Staff	14.395	36
Labour Disputes	13.711	37
Health (Noise ,Dust ,Vibration .)	13.078	38
Insufficiency of transportation facilities	12.629	39
Maintenance and Repairing	12.469	40
Payment Delays	12.422	41
Weather Implication	12.234	42

VI. CONCLUSION

The construction industry is considered as an important sector in the world as it develops and achieves the goals of society, at the same time Crushing plant plays role of backbone of the construction industry, so it should be provided proper attention to maintain silence over the plant. A questionnaire-based survey was used to judge the attitude of Organization, project managers, engineers, employees and Labour towards risk and safety at crushing plants in central Gujarat Region., 55 questionnaires were distributed out of which 40 questionnaires were returned. The respondents were asked to indicate the level of importance of each of the 42 factors as less impact, moderate impact, high impact and probability of each of the 42 factors as Always, Frequent, Never.

The result indicates that most significant factors for safety and risk purpose are Plant Cost, Taxes Changes, Blocked Certificate, Storage and Handling, Uncertainty of Blasting Material Availability, Difficulties In Disposing Equipment, Incomplete Design, Uncertain Productivity, Co-ordination with sub-ordinates, Non-availability of operators for equipment.

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