

## **A Study on Risk and Safety Management in Different Construction Companies Using Anova Test**

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### ***Abstract***

*Due to revolutionary change in industrialization, working at ever changing condition and work culture are the basic requirement for construction line. In India issues related to risk, safety and health management are high on note. A large scale of workers is their motive regarding construction work, only into earning money for daily need. Lack of experience, motivation, and training exposure leads them towards the accidental problems. In this study a survey has done among 5 building Construction Companies. The data was collected and analyzed by using questionnaires which were developed on health safety and risk management system. The information collected and analyzed by using one way anova test.*

**KEY WORDS:** *Risk management, Safety management, Anova test*

### **Introduction**

Considering all kind of industries in India (Construction, manufacturing, mining etc.) based on fatal injury, rate of construction industry is higher than the other industry. In building construction industry fatal and non- fatal vocational injuries occurs frequently due to the workers attention and the nature of the work. The factor is used to measuring the risk and its possible loss is called as risk

**International Journal Of Core Engineering & Management (IJCEM)**  
**Volume 2, Issue 5, August 2015**

judgment, which is helpful to predict the safety measures to decision making. Nearly 6.5 million people work at approximately 52,000 construction sites across the nation on any given day (The Hindu, Sept. 9, 2006). Most construction accidents result from basic root causes such as lack of good training, inferior enforcement of safety, insecure equipment, unsafe methods or determining, unsafe site conditions, not using the safety equipment that was provided, and a poor attitude towards safety (Toole, 2002; Sokol 2004; Hecker et al., 2005). There is a considerable need to have an effective safety and health risk assessment procedure to improve the construction project performance. In statistics, one-way analysis of variance (abbreviated one-way ANOVA) is a technique used to compare means of three or more samples (using the F distribution). This technique can be used only for numerical data. In this research, occupational safety, health risk in construction industries one considered as key factors. This study helps to improve the exiting methods.

## **Material and Method**

Collection of data: Collection of data is based on the survey and questionnaire of 5 construction companies in Varanasi India namely (a) raj build zone pvt ltd, Varanasi India (b) Cenit infrastructure pvt ltd, Varanasi (c) Jeet homes solutions pvt ltd, Varanasi (d) sine city infra project pvt ltd, Varanasi (e) Rudra real estate Pvt ltd, Varanasi

Questionnaire: The companies were provided with a set of questionnaire factors that includes number of person injured or fatality during five years of project duration. The factors includes accident occurs due to workers who operates construction vehicles, equipment accident injury due to overturn, vehicles collision, being caught in running equipment, construction work accident occur from the movement of construction vehicles and equipment in the construction work zones.

Questionnaire sample for five years of construction projects:

1. How many come in contact with moving parts of a machine-when maintaining?
2. How many come in or on moving vehicle with loss of control?
3. How many come in contact with electricity-wires?

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4. How many fall from height-moveable platform?
5. How many fall from-nonmoving vehicles?
6. How many fall down from stairs or ramp?
7. How many struck by moving vehicles
8. How many come in contact with falling object-manual handling?

Statistical analysis: The data was collected from all the five companies for the questionnaire and the mean value was tabulated.

### **Results and discussion**

The mean value was calculated by preparation of the questionnaire in five different construction company in Varanasi (India) and found that risk is reduced to small construction company. Some of the values of the factors were found to be very common which are provided in Table 1,2,3,4 and 5. The reasons behind the common values for these factors are because the lack attention the construction site. Total for five companies, the questionnaires were given, all the questionnaire survey was done from the project manager of the project or the site engineer, contractor, sub-contractor, supervisor and the workers.

Table 1. Risk factors analysis-raj builds zone pvt ltd, Varanasi, India

SN	Factors	1st year	2nd year	3rd year	4nd year	5nd year	Mean value
1	How many come in contact with moving parts of a machine-when maintaining	1	0	0	0	0	.2
2	How many come in or on moving vehicle with loss of control	2	0	1	1	0	.8
3	How many come in contact with electricity-wires	1	1	3	0	0	1
4	How many fall from height-moveable platform	3	2	0	0	1	1.2
5	How many fall from-nonmoving vehicle	1	0	0	0	0	.2
6	How many fall down from stairs or ramp	1	0	1	1	0	.6
7	How many struck by moving vehicle	1	1	3	0	0	1
8	How many come in contact with falling object-manual handling	1	1	1	0	0	.6

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Table2. Risk factors analysis-cenit infra-structure pvt ltd, Varanasi, India

SN	Factors	1st year	2nd year	3rd year	4nd year	5nd year	Mean value
1	How many come in contact with moving parts of a machine-when maintaining	1	3	0	0	0	.8
2	How many come in or on moving vehicle with loss of control	2	1	0	0	0	.6
3	How many come in contact with electricity-wires	0	1	0	0	0	.2
4	How many fall from height-moveable platform	0	0	3	0	0	.6
5	How many fall from-nonmoving vehicle	1	1	2	0	1	1
6	How many fall down from stairs or ramp	1	0	0	0	0	.2
7	How many struck by moving vehicle	0	0	2	1	0	.6
8	How many come in contact with falling object-manual handling	1	1	1	1	0	.8

Table 3.Risk factors analysis-jeet homes solutions pvt ltd, Varanasi, India

SN	Factors	1st year	2nd year	3nd year	4nd year	5nd year	Mean value
1	How many come in contact with moving parts of a machine-when maintaining	1	2	1	1	0	1
2	How many come in or on moving vehicle with loss of control	2	1	1	0	1	1
3	How many come in contact with electricity-wires	3	1	2	0	0	1.2
4	How many fall from height-moveable platform	2	1	0	1	0	.8
5	How many fall from-nonmoving vehicle	0	0	2	1	1	.8
6	How many fall down from stairs or ramp	1	2	1	1	0	1
7	How many struck by moving vehicle	0	1	1	0	0	.4

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8	How many come in contact with falling object-manual handling	1	1	0	0	0	.4
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Table4. Risk factors analysis-sine city infra project pvt ltd, Varanasi, India

SN	Factors	1st year	2nd year	3rd year	4nd year	5nd year	Mean value
1	How many come in contact with moving parts of a machine-when maintaining	1	2	0	0	3	1.2
2	How many come in or on moving vehicle with loss of control	2	1	0	3	3	1.8
3	How many come in contact with electricity-wires	1	1	1	2	0	1
4	How many fall from height-moveable platform	0	0	0	0	1	.2
5	How many fall from-nonmoving vehicle	2	0	2	0	0	.8
6	How many fall down from stairs or ramp	1	1	1	0	0	.6
7	How many struck by moving vehicle	0	0	0	0	0	0
8	How many come in contact with falling object manual handling	1	1	0	1	0	.6

Table5. Risk factors analysis-rudra real estate pvt ltd, Varanasi, India

SN	Factors	1st year	2nd year	3rd year	4nd year	5nd year	Mean value
1	How many come in contact with moving parts of a machine-when maintaining	1	2	0	0	1	.8
2	How many come in or on moving vehicle with loss of control	2	1	0	1	0	.8
3	How many come in contact with electricity-wires	1	1	0	1	0	.6
4	How many fall from height-moveable platform	0	0	0	0	0	0
5	How many fall from-nonmoving vehicle	1	1	0	1	0	.6
6	How many fall down from stairs or ramp	1	2	1	1	0	1

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7	How many struck by moving vehicle	3	2	1	1	1	1.6
8	How many come in contact with falling object-manual handling	1	1	0	0	1	.6

### Conclusion

A field survey was conducted in Varanasi, India for calculating the risk factor in construction field. In this survey injuries rate of five Construction Company was calculated by preparing questionnaire with the help of safety and health experts and risk management staff. After discussion these conclusion was drawn is

- 1: Improvement required on the ground of safety functions and risk identification.
- 2: Compensation and insurance must be the principles part in contract agreement.
- 3: Most of the workers are not satisfied with the insurance policy and safety rules, there should be considerable beneficial policies required.

### Acknowledgement

I would like to express my gratitude to all the respected professors, faculty staff and my friends especially Anamika Soni, Mukesh Kumar and Vinit Kumar Singh for their co-operation, support and guidance during entire investigation.

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