



## Safety Challenge in High Rise Building

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### ABSTRACT

According to the International Building Code and the Building Construction and Safety Code, high-rise buildings are buildings of 75 feet or greater in height measured from the lowest level of fire department vehicle access to the floor of the highest occupiable story. High-rise buildings increase in number every year and the most common high-rise buildings are the commercial ones, but recently investors have turned part of their attention to residential high-rise buildings which is also on the increase and for that matter the focus of this study. The aim of this paper is to evaluate the impact of high rise living upon residents' satisfaction. My study specifically attempts to determine the important benefits of living in high rise buildings, to determine the critical challenges faced by residents of high rise buildings, to determine the level of satisfaction of occupants of high rise buildings and to make recommendations to improve on present and future high building schemes. In achieving the objectives of this paper, the survey design was chosen. The target population involved all occupants of residential high-rise building with a convenient sample of 65 respondents selected randomly to participate. The structured questionnaire was used to collect views from respondents and the Statistical Package for the Social Sciences was used to analyze the data. The study found that despite the challenges occupants faced with high living, occupants were generally satisfied and also enjoyed the benefits of privacy and luxury living. The study however, ended with some recommendations. Accident cases from machines/tools always being a major percentage but deaths are mainly by falling and electric shocks. In most cases, the control of safety management at sites is not strictly, frequently slacken while the owner and contractors only focusing on

completion schedule and profits; insufficient interest to safety for people on sites. Major part is from the lack of understandings/perception on safety of the workers themselves. Everyone should be aware of the importance of safety, everyone should be aware about the preciousness of human being and many losses come from the accidents.

**Keywords:** Safety, Incidents, Policy

### 1. INTRODUCTION:

Safety, as a concept and practice, is in transition. It has shifted from what once was little more than plain-sense approach to eliminating agents of injury to what now is quite often a complex methodology for the reliable control of harm. Within the boundaries of safety's emerging abilities exists a capacity for more than simply the detection of causative relationship and design of practical controls. These have been safety program routines practically since their inception, and the skills involved have increased with each succeeding year.

The current shift occurs in the growing awareness of and ability to meet the need for affecting the wanted controls. This seems to be an ordinary, expected outcome. However, common experience reminds us that injurious occurrences are repeated despite knowledge of their causes or the availability of recommended controls. Indeed, implementation difficulties have been the critical problem for safety control programs. Safety is a humanitarian as well as an important issue in development progress. Nobody wants to hurt others to be a troublemaker however, without rules that govern the misdeed or irresponsibility it is going to be easy for people to

commit safety violations. In addition to the assets value loss resulting from unsafe damage, some of the safety violations are very serious and may well cause serious unrecoverable consequences. In India, a building greater than 75ft (23 m), generally 7 to 10 stories, is considered as high-rise. Also, a building is considered to be high-rise when it extends higher than the maximum reach available to fire fighters. According to the building code of India, a tall building is one with four floors or more, or a high-rise building is one 15 meters or more in height. Most of the tall buildings in India are in the commercial capital Mumbai. More than 2500 high-rise buildings are already constructed.

## 2. OBJECTIVES AND SCOPE OF THE STUDY

The ultimate goal for every enterprise should be to have “zero incidents”. This goal provides the incentive to achieve the best possible performance and ensures continuous vigilance towards greater safety. Seeking to achieve this goal and managing safety requires a constant effort that involves establishing safety-related objectives, implementing those objectives, and measuring and reviewing progress in meeting those objectives. This should be reflected in the long-term, overall Safety Policy. In order to ensure day-to-day implementation of the Policy, concrete goals and objectives should be established and agreed upon by the entire organization.

This is to provide a tool for measurement for the contractors to plan the safety measures and integrate the safety concerns in the construction process. Specifically, the objectives of this project are:

- Identify the key behavioral factors affecting the performance of people during a fire in a high-rise building and the singularities associated to this type of buildings.
- Review the current procedures and strategies currently adopted in high-rise buildings (e.g. horizontal and vertical evacuation methods, phased evacuation, total evacuation, defending-place, etc.).
- Review the capabilities of the currently available evacuation models to simulate high-rise building evacuations.

### 2.1.Scope of work:

1. Less planning time, Shorter installation times.
2. Increased comfort and energy, efficiency

3. Increased security and protection for people, data and construction processes.
4. Customers can concentrate on the core business.
5. Lower operating expenses.
6. Increased reliability of technical infrastructure.
7. Higher productivity.
8. Increased protection of investment throughout the building’s entire life span.

## 3. REVIEW OF LITERATURE

I studied different literature review for safety challenges in high rise building. Safety is one of the major aspects in high rise buildings in construction sector. The main researchers among them are:

**According to Professor N. Krishnamurthy:** Safety in high rise design and construction He concluded that every designer shall ensure that any design he prepares should among the design consideration.

**According to Romel G. Solis:** Construction Worker’s Perception of Safety He concluded that there should be safety awareness at sites to prevent and minimize risks.

**According to Ian McIver:** Investigating the application of building Regulation He prepared a document which aimed at both the developers and the building regulations.

### 3.1 Site Visits:

I visited following sites for my research work:

- UTC Sofftech Pvt Ltd NOIDA Expressway
- Laureute builwell Pvt Ltd NOIDA Sec-108
- Arabian Construction Companies NODIA, Sec-94
- Ashiyan NODIA, Sec-16
- Ashiyan NODIA, Sec-19
- ABL Humhama, sgr, J&K
- ABL Bemina, sgr, J&K
- ABL Barzulla Baghat, sgr, J&K
- M.M. Shalls Dalgate
- JKPCC Handawara

**3.2 Preparation of Questionnaire:**

I prepared 31 questions and distributed in different 10 sites and got the result from different respondents (Junior Engineer, AEE, Supervisor, and Project Manager).

**3.3 Data collection:**

I collected the data from 80 respondents from different 10 sites from New Delhi(NCR), NOIDA, Srinagar, Handwara.

**3.4 Limitation of the Study:**

In my research work I faced the following problems:

- Collection of data from different sites of the companies was difficult.
- Management was hesitant to share data.
- Management was not willing to share their views on my topic which become major difficulty in completion of my work.

**3.5 Result of the survey:**

The result of my survey report is lack of safety awareness among workers on site. There is only 34.5% awareness of safety on sites.

**4. QUESTIONNAIRE**

Note: - Rate the below questions as per your site. Each star equals to 20%.

Q1. Is High Rise Building evacuation different from other buildings?



Q2. If stair travel potentially dangerous are there alternatives?



Q3. If existing downstairs take so long, am I better of going up to the roof and waiting for rescues there?



Q4. Should high rise buildings have any type of exterior device?



Q5. Will buildings egress system work in a terrorist attack?



Q6. Is there any particular arrangement for the persons /occupants with disabilities during emergency?



Q7. How much percentage work is executed according to the safety code?



Q8. Is safety provided against falling from windows and terraces?



Q9. Is safety provided against electric accidents due to lose electric fitting, hanging wires extra?



Q10. What percentage of treatment can we provide in emergency on site?



Q11. Are workers aware about the safety precautions?



Q12. Is safety education provided to the labors before work?



Q13. Should there be any age limit for labors in high rise building?



Q14. How much percentage of labors are aware about the insecure actions causing major accidents?



Q15. Is high rise building safe for occupants?



Q16. What percentage of workers are using for personal protection equipment's?



Q17. How much experience a labor need in high rise building construction?



Q18. Are you taking the proper inspection of formwork properly?



Q19. Is glaring the illumination on your eyes?



Q20. Irresponsible behavior of workers in evidently risky situation?



Q21. Temporary structures are used many times which got damaged and weak at critical



locations ultimately lead to accidents or failures.



Q22. Is there any safety plan and program or policy at the construction site?



Q23. Is there any emergency plan to cope with unanticipated circumstance?



Q24. Is there any special arrangement to capture falling debris from height?



Q25. Periodically and frequently safety check conducted at the site or not?



Q26. Can fatigue or boredom is a main cause to an accident?



Q27. Worker while performing the task wears a uniform or not for e.g. wears boot or sandals?



Q28. Are you agreeing workers play a main role in the prevention of the accidents?



Q29. Are you agreeing workers are the ones which are more prone to accidents than managers or engineers?



Q30. Is Fire safety equipment's are putted at place during the construction stags?



Q31. Fall protection systems are provided at construction stags or not?



## 5. RESULT AND DISCUSSION

**Table 5.1 Names, Symbols, Company, Type of Projects etc. of sites**

S.No	Symbol	Name	Designation	Phone No	Company Name	Type of Project	Location
1	S-1	S Panda	Project Head	9971694379	UTC Softech Pvt Ltd	Common High Rise	NOIDA Expressway
2	S-2	Raj kumar	planning engineer	8447752846	Laureute builwell pvt ltd	Residential	NOIDA Sec-108
3	S-3	Saptrshi neagi	Asst.manager HSE	8587835023	ACC	Residential	NODIA, Sec-94
4	S-4	Imtiyaz Ahmad Mir	J.E	9622440991	ABL	Residential Apartment	Humhama,sgr, J&K
5	S-5	Basharat Ali	AEE	9596959290	ABL	Residential Apartment	Bemina,sgr, J&K
6	S-6	Afaq Khandey	J.E	9906522296	ABL	Residential Apartment	Barzulla Baghat,sgr, J&K
7	S-7	Jameel khan	J.E	9419656433	M.M.Shalls	Official	Dalgate
8	S-8	Umair Ansari	J.E	9560722069	Ashiyani	Tower Const	NODIA, Sec-16
9	S-9	Adil iqbal	J.E	9015585021	Ashiyani	Tower Const	NODIA Sec- 16
10	s-10	Rifat khalid	AEE	9419059165	jkpcc	hospital	handawara

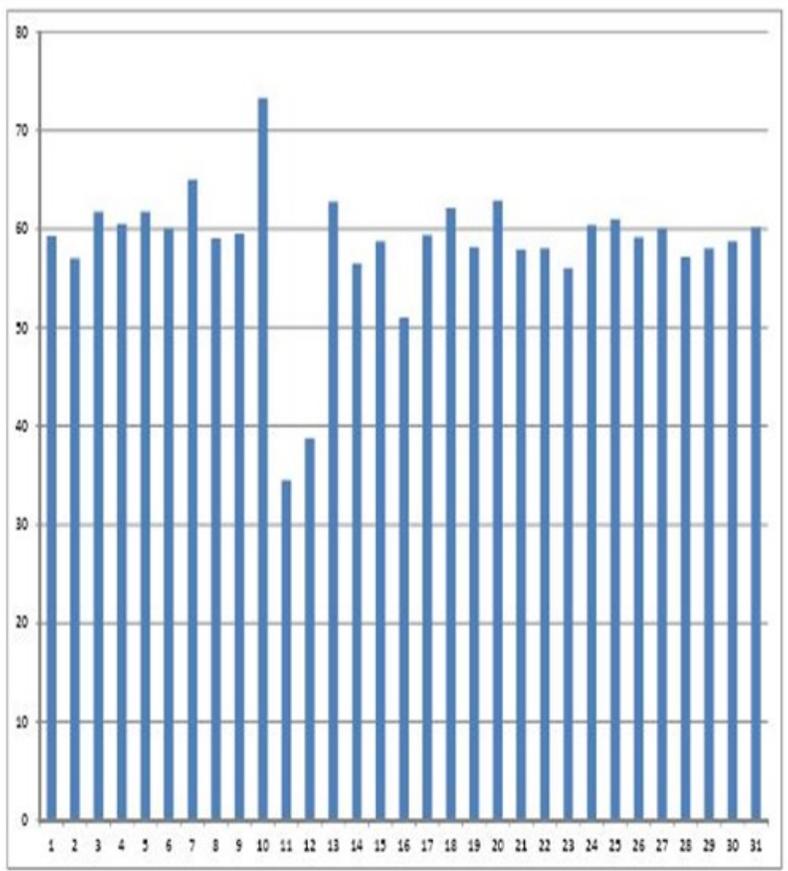
**Table 5.2 %age of safety awareness among workers on site, analysis**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
	S-1	SA-1	SA-2	SA-3	SA-4	SA-5	SA-6	SA-7	S-2	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	S-3	SC-1	SC-2	SC-3	SC-4	SC-5	SC-6	SC-7	S-4	SD-1	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7	S-5	SE-1	SE-2	SE-3
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72	73	74	75	76	77	78	79	80		
SI-7	S-10	SI-1	SI-2	SI-3	SI-4	SI-5	SI-6	SI-7	Mean Value	Percentage
2	4	2	3	2	1	2	2	2	2.96	59.25
3	3	3	3	1	2	3	3	3	2.85	57
2	5	2	4	1	2	2	3	3	3.09	61.75
2	3	1	4	2	1	2	4	4	3.03	60.5
3	5	2	4	3	2	1	3	2	3.09	61.75
2	3	3	3	3	3	2	1	5	3.00	60
3	2	3	2	1	1	3	2	1	3.25	65
4	5	2	1	2	3	4	3	1	2.95	59
4	4	1	1	4	3	4	5	4	2.98	59.5
4	4	4	4	2	2	2	2	2	3.66	73.25
2	2	2	0	0	0	0	0	0	1.73	34.5
2	2	2	2	2	2	3	2	2	1.94	38.75
3	3	3	3	1	2	3	2	3	3.14	62.75
3	2	4	3	1	1	2	3	3	2.83	56.5
5	2	5	5	5	2	5	3	5	2.94	58.75
2	2	2	2	2	2	2	1	2	2.55	51
3	5	3	2	3	5	2	5	1	2.97	59.375
3	4	4	3	3	3	3	5	3	3.11	62.125
2	3	5	4	2	3	3	4	4	2.91	58.125
2	3	4	4	1	1	4	3	5	3.14	62.875
1	5	3	1	1	1	3	2	4	2.89	57.875
2	3	2	1	2	2	3	2	2	2.90	58
2	2	1	2	3	2	4	1	5	2.80	56
3	1	2	2	4	4	5	1	4	3.02	60.375
4	5	3	2	3	4	4	4	1	3.05	61
4	5	2	2	4	4	4	4	2	2.96	59.125
5	2	1	1	1	5	5	4	3	3.00	60
4	4	2	2	1	4	4	2	4	2.86	57.125
3	4	3	3	2	3	4	2	5	2.90	58
2	3	4	1	2	2	5	2	4	2.94	58.75
2	3	4	2	3	1	5	1	3	3.01	60.125



## 6. CONCLUSION

From my project I concluded that there is lack of safety awareness among workers on site. Workers should provide Safety Management System (SMS) for safety purposes.

The SMS is a must for every construction project, especially for high-rise construction because this area is consisting of many latent hazard and risk. Without SMS, the owners, developers, investors, shareholders, and managers cannot reach the goal and target as expected. On the other hand, the contractors, suppliers, installers, and workers cannot fulfill and complete their mission.

In overall, without SMS, the construction of a high-rise will become very dangerous and the casualty/damage cannot be prevented. The SMS must be set up and strictly implemented and it should comprise of the main frames:

- Safety Policy
- Safety Organization
- Safety Plan & Program
- Hazard & Risk analysis and identification
- Safety Documenting & Recording
- Safety Review & Upgrading

In addition, high-rise construction project should also have strong and powerful PM/CM team who will monitor, control, and handle the safety matters (e.g. review and approval of safety plan/program submitted by the contractors and sub-contractors). It is also their duty to strictly implement these safety plans which normally and basically include the following:

- Safety management/hierarchy/organization
- PPE availability, use and conditions
- Scaffolding (fixed and mobile) including ladders & platforms
- Electro-mechanical activities and controls
- Site status
- Temporary power supply and tools
- Health & welfares
- Storage condition
- Fire prevention

- Waste/pollution control
- Monitoring and control of working on height
- Aid/first aid and evacuation
- Emergency plan for unanticipated circumstances

The PM as the owner representative should have strong and effective ways to force all contractors and their subs at site to totally and absolutely comply with safety rules. It is necessarily to cleverly apply the method of fine and reward to guarantee the safe situation at site workplace.

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