

An Integrated Approach Lean Six Sigma and Risk Management in Entertainment and Media Industry

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Abstract

This Paper is about integration of Six Sigma with risk management in Entertainment Media Industry. It was applied in *Saudi Broadcasting Corporative* in Riyadh. The problem is in media industry there is risk of safety that decline the performance of employees within the industry, by the implementation of Integrated approach on media industry resulted a lot of improvements. The Six Sigma method used in problem solving activities is DMAIC (Define, Measure, Analyze, Improve, and Control). Statistics and quality tools, such as process capability, control chart, fishbone diagram, etc. are used. All five Six Sigma stage will be presented in detail and with the use of those statistic and quality tools. Finally, result after improvement will be presented and some recommendations are proposed.

Keywords

Quality Management Principles / Practices, SMEs, Business performance

1-INTRODUCTION:

1.1-Six sigma and review:

The Entertainment & media industry is one of the blooming industries in the world. The most of the research carried in different sectors, although the revenue generated by this industry is much more as compared to any industry ,therefore we have choose our area of research in this sector, Six sigma with integration of certain tools gives enormous outcome regardless of using it single in any sectors.

It is a business strategy that focuses on improving customer requirements understanding, business systems, productivity, and financial performance. Dating back to the mid 1980s, applications of the six sigma methods allowed many organizations to sustain their competitive advantage by integrating their knowledge of the process with statistics, engineering, and paper management (Anbari, 2002).[1]

Over the past few decades, Six Sigma has been espoused by many world-class companies and has also a lot of successful cases. The main benefit of a Six Sigma program is the elimination of subjectivity in decision-making, by creating a system where everyone in the organization collects, analyzes, and displays data in a consistent way (Maleyeff & Kaminsky, 2002)[2]. The Six Sigma approach differs from previous process improvement programs in terms of being exclusively a customer-driven and data-defined system (Breyfogle, 2003).[3] The Six Sigma concept originates from the lower-case Greek letter sigma, the statistical symbol for the standard deviation of a data distribution. The current use of Six Sigma is only 33% for manufacturing, 8% for healthcare and other services, and 6% for education. However those manufacturing and transaction Six Sigma programs have proven to be one of the most successful process improvement systems in recent years (Snee & Hoerl, 2003)[4]. Six Sigma process improvement programs have recently exploited practices to enhance corporate dynamic capabilities by the implementation of Six Sigma in an e-business environment. Fundamentally, e-business is the

application of advanced information technology, particularly through the use of the Internet, to enhance the performance of business operations. It has been shown that the Internet speeds up data collection, identifies common solutions, and accelerates the sharing of best practices (Dolan, 2003)[5].

Despite the immense popularity and the wide-spread adoption of Six Sigma, there is an increasing concern across industries regarding the failure of Six Sigma programs. One reason many Six Sigma programs fail is because an implementation model detailing the sequence of Six Sigma elements/activities is not available. The existing literature identifies many elements of Six Sigma which does enhance our understanding of Six Sigma programs. However, the success of Six Sigma programs hinges on the sequence of many Six Sigma elements/ activities or a model for implementation. To put it differently, it is well known that one needs many ingredients for Chicken Curry. However, in order to cook a delicious Chicken Curry, according to Jaffery (2003)[6], the recipe requires a sequence of ingredients/activities (e.g., heat oil, fry onion and garlic, add Indian spices, put in chicken, pour water, and let it simmer). Any unreasonable deviation from the recipe will lead to less than positive experience. In the absence of a recipe or a model, it is not surprising that many implementations of Six Sigma programs have failed. A survey of aerospace companies concluded that less than 50% of the respondents were satisfied with their Six Sigma programs (Zimmerman and Weiss, 2005) [7]. Another survey of healthcare companies revealed that 54% do not intend to embrace Six Sigma programs (Feng and Manuel, 2007)[8]. From above discussion and a lot of literature review we decide to bend our research to an integrated approach, although a thousands of industries implemented six sigma and they are getting benefit, but now world is moving towards the extreme of competition. Industries now no more rely only on six sigma they are using six sigma as an integrated approach.

1.2- Risk management:

Risk refers to the uncertainty that surrounds future events and outcomes. It is the expression of the likelihood and impact of an event with the potential to influence the achievement of an objective. In its most basic terms, risk can most easily be thought of as something that can go wrong and which can prevent you from achieving your objectives. Risk management is a process for identifying, assessing, and prioritizing risks of different kinds. Once the risks are identified, the risk manager will create a plan to minimize or eliminate the impact of negative events. A variety of strategies is available, depending on the type of risk and the type of business.

The word enterprise for Enterprise Risk Management (ERM) itself shows a different meaning than Traditional Risk Management (TRM). Enterprise means to integrate or aggregate all types of risks; using integrated tools and techniques to mitigate the risks and to communicate across business lines or level compared to Traditional Risk Management. Integration refers to both combination of modifying the firm's operations, adjusting its capital structure and employing targeted financial instruments (Meulbroek, 2002)[9].

In the increasingly competitive and globalized marketplace, technological innovation is one of the important key strategies for high technology firms to survive and achieve corporate growth (Teece, 1986; Freeman and Soete, 1997)[10]. However, various types of innovation (Dewar and Dutton, 1986; Henderson and Clark, 1990)[11] involve different degrees of uncertainty in technologies and markets that may cause failures of R&D papers (Doctor et al., 2001; Raz et al., 2002; Lee et al., 2010)[12]. Therefore, it is important to manage risks for innovative R&D papers through all the development stages to improve their success rates (Smith and Merritt, 2002; Keizer et al., 2002; Bush et al., 2005; Pisano 2006)[13]. Risk management is a structured approach for the identification, assessment, and prioritization of risks followed by planning of resources to minimize, monitor, and control the probability and impact of undesirable events.

In 2002 the Media, Entertainment & Arts Alliance identified the need for the drafting of a safety code specifically for media workers including photographers, graphic artists, camera and sound crews as well as journalists. The Alliance noted that unsafe work situations confront journalists in their daily work, particularly when reporting wars, bush fires, even political events and court cases. And so the Alliance commissioned this paper through a WorkCover New South Wales Assistance Grant with aim of creating the basis for a journalists' safety code akin to the other codes relevant to Alliance members: the Film Industry Safety Code and Safety Guidance Notes for the Entertainment Industry. The University of Sydney's research and training arm, acirrt, conducted the focus groups to attain an independent perspective. The paper identifies the occupational health and safety issues facing media workers and provides a platform for addressing some of the issues [14].

2-Methodology:

The methodology composed of integrated approach concerning entertainment & media Industry, The Six sigma is aligned with the risk management, The data regarding different types of risk are collected and analyzed. The software (Microsoft Networks) is used for analysis of probability of occurrence of each cause. After implementing Microsoft network we have a clear image about each cause severity and frequency of occurrence. The major risk are identified in Entertainment & media industry and then six sigma is applied. We apply DMAIC philosophy.

2.1-Define:

2.1.1-Problem definition:

Our problem in Media industry was that Employees always complain that there is always occurrence of accidents & risk for safety was high, this situation for employees and for the organization creates an environment of uncertainty. The existing environment restricts the employees to perform better.

2.2-Measure:

During Measure Phase the overall performance of the Core Business Process is measured. There are three important part of Measure Phase:

- 1-Data Collection
- 2-Data Evaluation
- 3-FMEA

Measuring safety level of any organization, it is necessary to glance at the layout of the industry, if the layout of any industry is in a manageable way then the occurrence of accidents or their probability of occurrence always remain very low. We studied the layout of Entertainment & media industry & we have found that layout was not properly constructed. The Workplace was much congested. The placement of equipments and computers was not in a suitable order. The aisles were not properly marked and no fix space was adjusted for aisle. Wires of electric equipments were dispersed with each other that may create a short circuit. There were no place if there should need for new equipments installed for future needs or competition of the market. Overall we conclude that this type of work place can create hazards at any time. We have collected the data from the media industry from previous reports and by face to face interviews of the employees.

2.2.1-Entertainment Industry Workplace Layout: In order to make a proper workplace environment which includes the health and safety issues of the employees we have to compare the both proper and improper layout arrangements regarding health and safety. We have derived the following outcomes regarding the existing workplace arrangements:

- There is no proper placement and identification of equipment, devices and systems into the workplace.
- There are no proper workstations and seating arrangements.

- There is no proper lining of traffic routes on the floor.
- There are no doors and gates in case of emergency.
- There are no placement of fire alarms and fire extinguishers into the workplace.
- There is no proper lighting on the work floor.
- There is no proper arrangement for falling objects into the workplace.
- There is no proper walkways/aisles identification on the floor for moving objects.
- There are no proper arrangements of disposal of waste materials in the workplace.
- There are no proper ventilation and temperature controlling system into the workplace.
- This is not a flexible layout for the future extension and addition of more equipments and devices into the workplace.

2.2.2-Data Collection Plan and Data Collection

A data collection plan is prepared to collect required data. This plan includes what type of data needs to be collected, what are the sources of data etc. The reason to collect data is to identify areas where current processes need to be improved.

We collect data from primary sources: input, process, and output. The input source is where the process is generated & Process data refers to tests of Safety assurance of the Employees. Data is collected for the following factors; the collected data is per annum basis.

Table-1

Types of Hazards	Frequency of Occurrence per Annual
Storage Hazards	2
Fire caused Hazards	3
Smoke Strobe lighting Hazards & Smokes and vapors Hazards	4
Lasers Hazards & Ultraviolet light Hazards	1
Pyrotechnics Hazards	1
Naked Flame Hazards	1
Set design and Production Hazards	3
Staging, Performers on Stage Hazards	2
Outdoor Events Hazards	1
Manual material Handling Hazards	4
Working at Heights Hazards	2
Fatigue Hazards	1

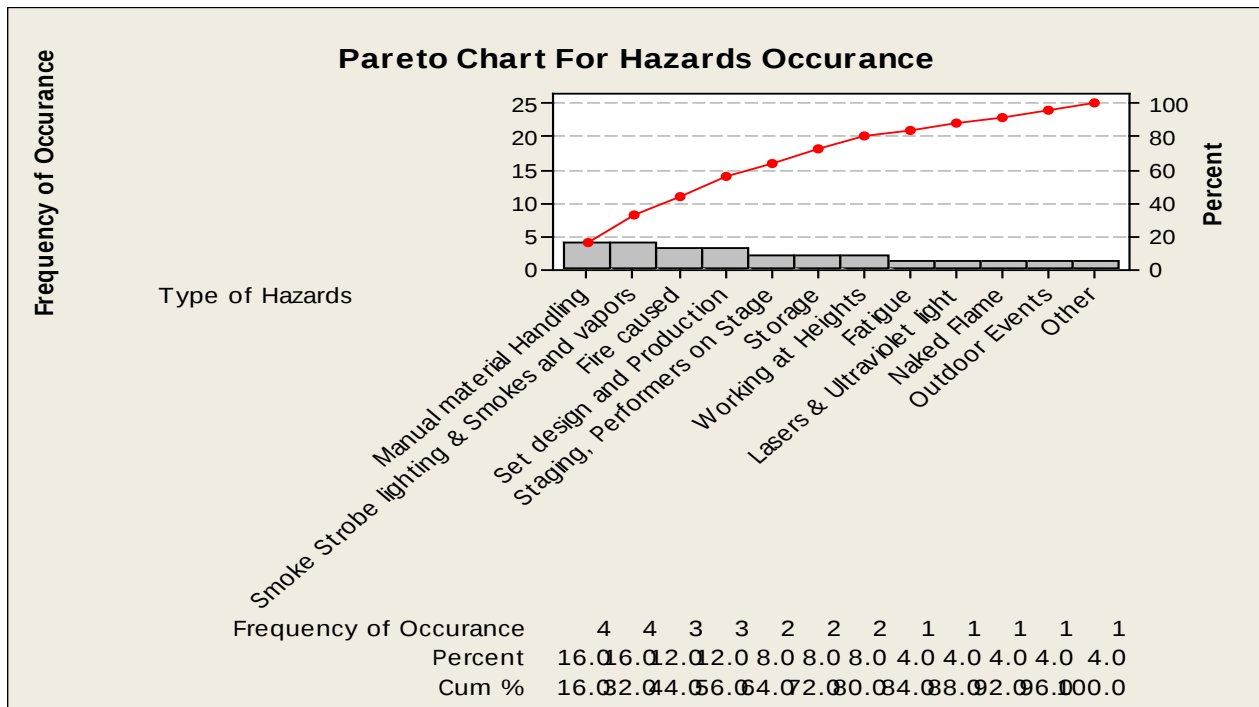
Type of accident occur in Entertainment & Media Industry

3.1- Analyze phase:

The analysis of data is done by using two tools

3.1.1-Pareto chart

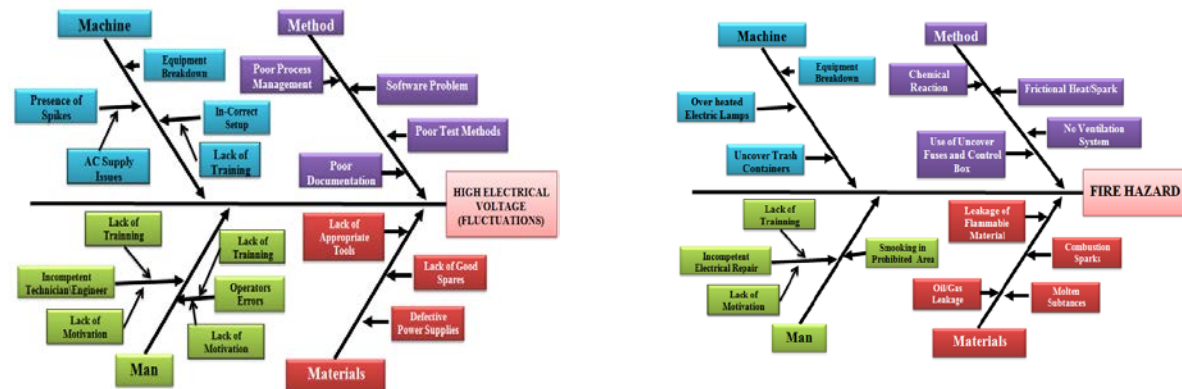
As we know that in Pareto analysis 80% of the problems are due to the 20% of the causes. So from this Pareto diagram we can to 20% (Manual handling, Strobe Light, Fire, Set design, Staging, Storage and Working at height) causes.



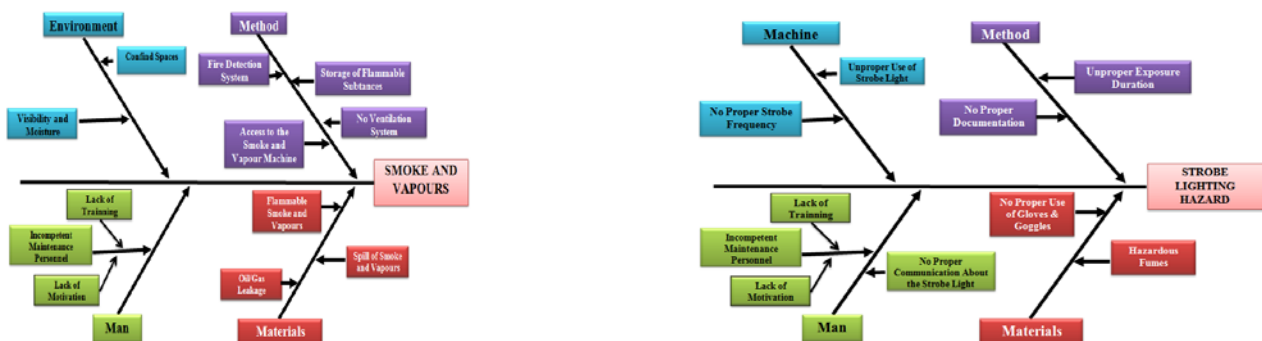
3.1.2-Root Causes Analysis:

Cause and Effect diagram is used in this phase as a tool to find the root causes of poor Safety. The output of the cause-and-effect diagram depends to a large extent on the quality and creativity of the brainstorming session. This diagram will lead us to some critical and specific causes to be eliminated or reduced, in order to improve the safety level and reduce the occurrence of hazards.

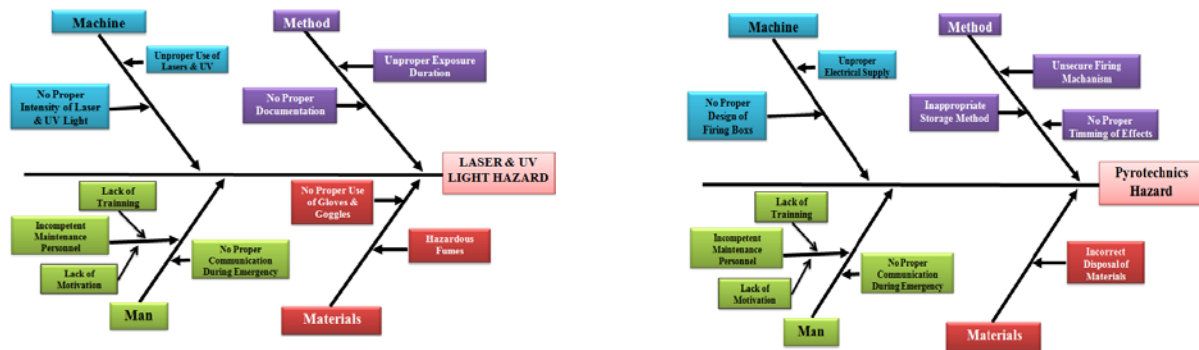
3.1.2.1-Cause & Effect Diagram for Electrical and Fire Hazards:



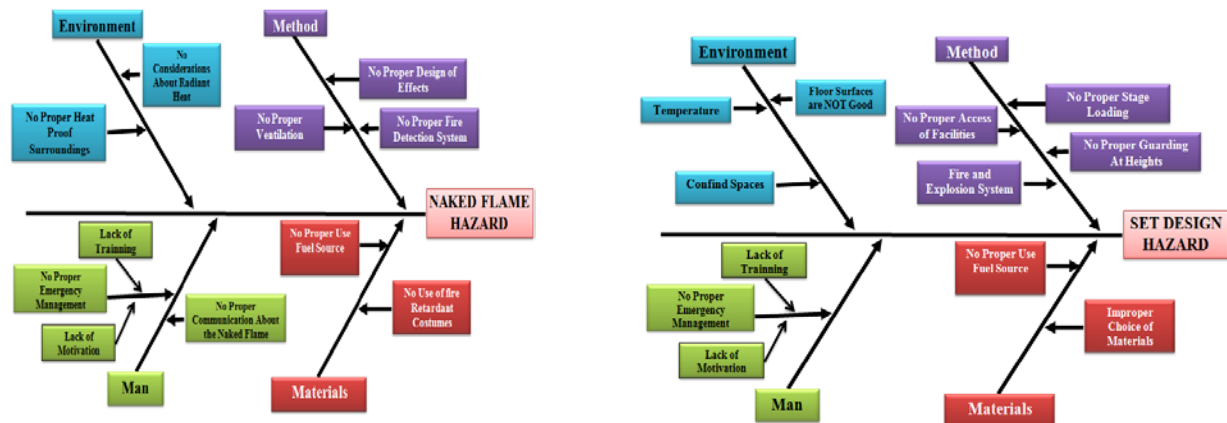
3.1.2.2-Cause & Effect Diagram for Smoke Vapors and Smoke Strobe Caused



3.1.2.3-Cause & Effect Diagram for Lasers Hazards, Ultraviolet and Pyrotechnics light Hazards



3.1.2.4-Cause & Effect Diagram for Naked Flame and Set design and Production Hazards



3.1.3 -Failure Modes Effects Analysis:

From the fishbone diagram, we have decided to solve on all causes in the diagram, because all causes have direct effect to the safer working environment in the Entertainment Industry. Only the method, we have divided into 2 (two) categories of solution. First one is **short-term solution** and the other is **long-term solution**.

Key Process Step or Input	Potential Failure Mode	Potential Failure Effects	SEVERITY	Potential Causes	OCCURRENCE	Current Controls	DETECTION	Risk Priority Number	Actions Recommended	Resp.
What is the Process Step or Input?	In what ways can the Process Step or Input fail?	What is the impact on the Key Output Variables once it fails (customer or internal)	How Severe is the effect to the customer?	What causes the Key Input to go wrong?	How often does cause or FM occur?	What are the existing controls and procedures that prevent either the Cause or the Failure	How well can you detect the Cause or the Failure Mode?	(RPN)	What are the actions for reducing the occurrence of the cause, or improving detection	Who is Responsible for the recommended action?

		<i>requirements)?</i>				<i>Mode?</i>			<i>?</i>	
Electrical Voltage	High Fluctuations in Electrical Voltage	Short circuiting , Equipment Breakdown, Cause Fire	9	Poor Management, Poor testing methods, Lack of trainings, Poor Maintenance, Poor Documentation	8	Weekly Maintenance Plan	6	432	Good Management of Tasks, Proper testing systems, Trainings of Maintenance staff	Maintenance Personnel
Smoke and Vapors	No proper means of handling smoke and vapors	Fire, Lungs diseases, Lose of Human life	8	Flammable Smoke and vapors, Oil/Gas leakage, No ventilation	8	Storage procedure of flammable substances	7	448	Proper storage of flammable substances	Warehouse Personnel
Strobe Lighting	Improper exposure duration	Eye infection, skin diseases	7	No Proper strobe frequency, No proper communication about the use	7	No proper Procedure about the use of Strobe lights	7	343	Proper procedure and Implementation of that procedure	Lighting Personnel
Laser and UV Lights	Improper exposure duration	Eye infection, skin diseases	7	No Proper Laser and UV light intensity, No proper communication about the use	7	No proper Procedure about the use of Lasers and UV lights	7	343	Proper procedure and Implementation of that procedure	Lighting Personnel
Noise Level	Sound Level beyond the human bearable level	Ears infection, Headache	8	No proper use of sounding medium	8	No properly implemented sound levels	7	448	Properly maintain sound levels, Use of Ear protectors	Sounding Personnel
Pyrotechnics	No proper use of Pyrotech	Fire, Lose of Human life	7	Unsecure Firing Mechanism, No	6	No proper maintenance of	7	294	Proper testing systems, Trainings	Maintenance Personnel

	nic devices and Firing boxes			Proper timing of effects, Improper disposal of Materials		Pyrotechnic devices and Firing boxes			of Maintenance staff	
Naked Flame	No proper Heat Proof environment	Fire, Skin damages, Lose of Human safety	7	No Proper design of effects, No considerations about Radiant Heat, No Use of Fire retardant Costumes	6	No procedures and communication about the use of Naked flames	7	294	Properly Implemented procedures	Effects Design Personnel
Set Designing	No Proper Design	Set Collapse, Lose of Human safety	7	No proper stage loading, No guarding at heights, Confined spaces	6	No proper facility design and access procedures	6	252	Proper use and access of facilities	Set Design Personnel
Manual Material Handling	Rough floor surfaces, No proper documentation	Objects damages, Lose of Human Safety	7	No proper storage system, No proper guarding at heights, Floor surfaces are not good	8	No properly Implemented storage and handling procedures	8	448	Proper procedure and Implementation of that procedure	Warehouse Personnel

4 -Improvement Phase:

Regarding the improvement phase in SIX SIGMA, there are some suggestions and techniques to improve the current scheme of the system:

- ✓ Analyze the whole system
- ✓ Check for the constraints in the system
- ✓ Focus the barriers to the efficient process and analyze them to resolve the issues
- ✓ Quality techniques are the options to adopt Quality techniques that are to be adopted.

4.1 -Brain Storming:

The basic and vital technique for the quality improvement is the brain storming. The personnel from the different department of the Entertainment & Media Industry focus on the cause barrier to efficient process and yield to the best solution for the system. In account to the improvement of the process of the above mentioned issues the outcomes of the brain storming are given below:

- ✓ Train the employees regarding safety measures & its importance in the organization.
- ✓ EMS should be implemented in the organization & exercising of safety measures should be in every week.
- ✓ Implement '5S' for proper cleaning of all articles of the media industry.
- ✓ The employees are trained to be multi skilled as for safety prospective.
- ✓ Guidelines for each risk should be provided or written beside the desk of each worker or available at each work place.
- ✓ During Set Design and Production & Outdoor Events Hazards s' personnel should must aware of danger of falling or other safety issues; they should use personal protective equipments.
- ✓ The place where Laser or UV lights are used the person should must proper clothes by which radiation cannot effect or the danger area should be red marked.
- ✓ Naked flame where used, it should not be in contact with other flammable material like petrol, clothes etc that may causes fire.
- ✓ Proper training of workers for handling material manually.
- ✓ Workers should use PPE while working at height
- ✓ The time Schedule of workers should be prepared as excess over time creates fatigues it is harmful for the efficiency and as well as health of the workers.
- ✓ Approaches to Meet the Best Practice to Minimize Safety risk.

5 -Control Phase:

In control phase we have different control action to control each cause.

The Hazard	Factors to Consider in Assessing Risk	Examples of Control Measures
Smoke and vapour effects	The type of smoke or vapours required and the nature of the substance.	A Material Safety Data Sheet (MSDS) is obtained, an assessment conducted in relation to exposure levels and potential adverse health effects
Firing devices	• Design and construction of firing boxes • The firing device should be electrically and mechanically safe and maintained in good condition.	• The firing device should be electrically and mechanically safe and maintained in good condition.
Lasers	Potential for laser emission or reflection entering the eyes	• Laser safety requires that lasers exceeding Class 1 or Class 2 are not to be used for display purposes except under carefully controlled conditions by a competent trained operator.
Strobe lighting	Does it have to be used?	• Assessment of the need for strobe lighting is carried out at the design stage of the event.
Naked Flame	• Nature and extent of flame effect	• An assessment of the risks associated with the effect should be carried out prior to the commencement of the performance.

UV Light	• Does it have to be used?	An assessment of the risks associated with the effect should be carried out prior to the commencement of the performance.
Working at heights	Height and support to the ladder	Provision for adequate scaffolding elevated work platforms and appropriate guarding.
Noise	• Transfer of noise • Positioning of instruments • Amplification	• Seating for musicians is arranged to provide adequate separation. • An appropriate sized space for the number of musicians and type of performance. • Hearing protection is made available for musicians and crew members.
Stage work	• Trips, slips, falls • Stairs • Raked stages • Direction, choreography • Fights	Prevention of injuries and elimination of risks to health and safety are taken into account in the design phase of each production

6.1-CONCLUSION:

- ✓ We can see from the above results in Improvement phase that we reached our goal for decreasing the occurrence of accidents of employees in media & Entertainment industry from 25 to 7 accidents per year; actually this was the objective of the integrated paper to minimize the occurrence of accidents and improve the standards of safety throughout the organization.
- ✓ The Control measures are described in control phase that are implemented and the results are maintained for long term operations.
- ✓ Implementation of integrated approach the image of the media industry has been improved.
- ✓ The morale of the workers is now increased and they are now happier as compared to the before implementing paper.
- ✓ The improvement graph of organization is now increasing as compared to in past.
- ✓ Media & Entertainment industry employees are now feel secure while working because now they are trained and well aware from the safety tools & techniques.
- ✓ Although this is new approach in media industry, because now for future research have more attraction in media & entertainment industry.

FUTURE RECOMMENDATIONS FOR RESEARCH:

- ✓ The further research on this topic may be done on different prospective, the research may be done on each causes of risk or business disorder in media industry.
- ✓ Individually Six Sigma can be applied to a specific section of the media industry, like Stage production, outdoor events, News Section or advertisement section of the media industry.

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