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Institution of Safety Engineers (India)

“Aim to prevent Accident, Protect Environment & Minimise Losses during disaster”

www.iseindia.in



About us: Institution of Safety Engineers (India) is established in year 2012 under ZJEW Trust, Registered under Public Trust Act in India, **Govt. Registration No. 5240** with objective to prevent accident, Protect Environment & minimise Losses during Disaster. Institution of Safety Engineers (India) is An ISO 9001:20015 certified institution and working to save Natural resources & control pollution. ISE (India) imparting EHS related Training to society and needy people for creating employment opportunities.

Services: Institution of Safety Engineers (India) provides Services to Industries, organization, Institution or needy related to Safety Health Environment & Quality. Such Services help to Control Risk at work place, Protect environment, improving Quality & Safety performance in Organisation. Highly Qualified, Skilled & Experienced Professional perform such Task from Institution of Safety Engineers (India) ends. Services Provide by Institution of Safety Engineers (India) is here under:

- Services for ISO Auditing & Certification (ISO 9001:2015, ISO 14001:2015, ISO 45001:2018) etc.
- Developing safety Manuals, poster, banner, sticker, Pocket booklet.
- 3rd Party Safety Health Environment Quality (SHEQ) Audit, Training, Inspection, Environmental monitoring, Testing & examination of Tools, Tackles, equipments, structures etc.
- Consultation services for Emergency Plan, DMP, QAP, EIA, EMP, EC, Waste Mgt. Plan, HAZOP Study, Fire Load calculation & survey, Lightning Protection Study, Safety Mgt. Plan etc.

Training: Institution of Safety Engineers (India) Conduct Short Term Training to create awareness among people to work for Preventing accident, Protecting Environment, minimizing losses during Disaster and create employment opportunities as EHS professional. Job oriented and short term Training Courses conducted by Institution of Safety Engineers (India) are:





- ISE-SM (Safety Management at work place), 24 Hours Duration.
- ISE-ICCOHSEM (International Certificate Course in Occupational Health Safety & Environmental Mgt.), Duration 96 hours.
- ISE-IDOHSEM (International Diploma in Occupational Health Safety & Environmental Mgt.), Duration One year.
- ISE-TQM (Total Quality Mgt.), Duration 24 hours.
- Integrated Lead Auditor (ISO 45001:2018, ISO 14001:2015, ISO 9001:2015), Duration 6 days & Lead Auditor (ISO 45001:2018,), Lead Auditor (ISO 14001:2015) & Lead Auditor (ISO 9001:2015), Duration 30 hours each.
- Post Diploma Industrial Safety, Duration One year.
- Diploma in Industrial Safety/ Fire/ Environment, Duration One year.
- Certificate course in Fire & Safety, Duration Three Month.

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Membership: Institution of Safety Engineers (India) also invites application for Membership. Member will be eligible to use Title SMISE/MISE/JMISE/IMSE/CMISE/OMISE before their Name and receive quarterly published Journal, newsletter and latest information related to Safety, Health, Environment & quality. Different research paper will also share with member that will help to identifying and improving Occupational health, Safety, Quality & Environmental performance in organisation. Member will be eligible to publish their article/ journal free of cost.

For more Details visit www.iseindia.in

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Award: To promoting Safety Health Environment & Quality Management System in organization, Institution of Safety Engineers (India) accept application and reward to elected person, organisation & Institution.





Study of Hazard Identification & Risk Assessment Techniques

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ABSTRACT

Now a day numbers of people injured or killed or huge losses of organisation property due to not controlling workplace Risk. Causes of such organisational harm are due to hazard. Hazard means any sources or situation that have potential to cause harm. To control workplace risk, Different techniques used to identify hazard and ensuring suitable control measure to prevent any type of organisational losses or harm in which one techniques is Hazard identification & risk assessment.

This study indicate positive safety impacts to control organisational losses proactively and ensure safe work place. It focuses how to identify sources or situation that may lead to cause accident & decide magnitude of risk of hazardous event and ensuring their control measure.

1. Keywords:

Hazard identification & Risk Assessment, Risk Control, Loss Control, workplace safety

2. Introduction:

Hazard identification and Risk Assessment is effective method to control workplace risk.

Risk is Combination of Likelihood & Consequences of specific Hazardous event occurring Safety Inspection, Job safety Analysis (JSA), Safety Audit, Checklist based inspection, like different techniques used to Identify hazard in which one most effective techniques is hazard identification & Risk Assessment (HIRA). Hazard identification & Risk Assessment (HIRA) is proactive approach, so hazard identify and Risk assessed proactively and easy to decide control measure and execute at workplace to control workplace risk.

It is prime responsibility of occupier/ employer to ensure safety of people & ensure safe healthy work environment, so organisation choose effective method to identify & control workplace risk.

3. Purpose of Hazard identification & Risk assessment

- To identify Potential source of harm & deciding magnitude of risk
- Controlling work place Risk
- Reducing organisational harm
- Increasing productivity
- Fulfilling legal requirement

4. Hazard identification & Risk Assessment.

Hazard identification is a procedure used to identify sources or situation that have potential to cause harm. & Hazard means any source or situation that have potential to cause harm like injury, fatality, ill health, property damage. Risk is combination of likelihood and consequences of specific hazardous event occurring.





Risk Assessment is overall process of estimating the magnitude of risk and deciding whether the risk is tolerable or not. Tolerable Risk means Risk that has been reduced to a level that can be endured by the organization having regards to its legal obligations and its own safety Policy.

Checklist Based inspection, Safety Inspection, Job safety Analysis like different techniques used to identify hazard. Previous injury report, Consultation of employees & experts advice play vital role to know organisational hazard. Safety Legislation, Codes, Safety manual, Material Safety Data sheet is also best source to know workplace or process related hazard. Risk can be assessed to consider likelihood & Consequence of hazardous event.



5. Risk Evaluation Method: The following criteria are necessary for organizations to carry out Effective risk assessment:

I). Classify work activities: Select & Prepare a list of work activities that run in organization and collect information about them like procedures, Materials, manpower.

II). Identify hazards: Identify sources that have potential to cause harm. In other word identify all hazards associated in each work activity.

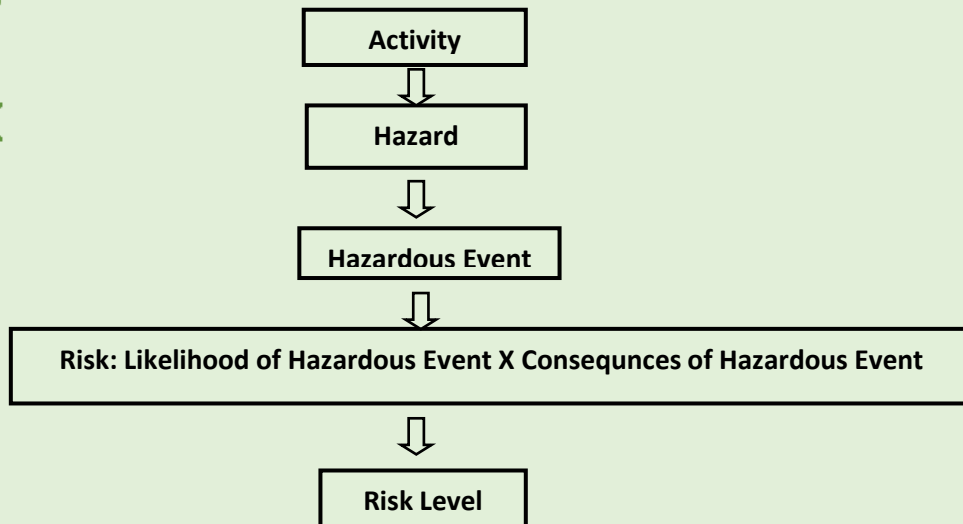
III). Determine risk: To estimate risk, Consider Likelihood & Consequence of Hazardous event. Consider existing control measure & gaps if any within organization and decide who might be harmed and how; what might be damaged and how; what will be cost of incident if occur. Select rating of likelihood & Consequence of hazardous event and multiply them to evaluate magnitude of risk. Risk can be also calculated with the help of Table matrix as per decided by organisation.

Risk: Likelihood (L) of Hazardous event X Consequence (C) of hazardous event

IV) Decide if" risk is tolerable: Decide planned or existing safety control measure or system are sufficient to control risk up to tolerable level. Risk can be control to reduce likelihood or consequence or both Together of hazardous event.

V). Prepare risk control action: If Risk level is not acceptable them prepare risk control action plan and execute it.





Likelihood & Consequence Rating of Event:

Likelihood of Hazardous event		Consequence of Hazardous event	
1	Very unlikely	1	No injury
2	Unlikely	2	First Aid Injury
3	Likely	3	Lost Time Injury (absence from duty more than 2 day and less than 21 days)
4	More Likely	4	Major injury (absence from duty more than 21 day)
5	Most likely/ Certain	5	Fatal/ Catastrophic

Risk Classification

Rating (R= L X C)	Level of Risk	Remarks
1-3	Low	No additional action required but implemented control measure to be maintained regularly.
4-9	Medium	Regular Supervision & Control measure to be taken.
Above 9	High	Stop work and take immediate action till risk not minimize up to As low as reasonable practicable (ALARP)

RISK ASSESSMENT PERFORMA

Location:

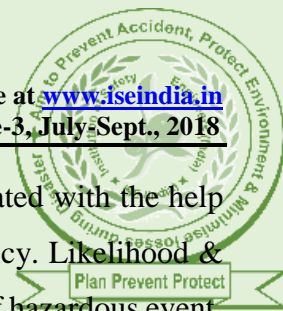
Department:

Name of agency:

Date:

Activity	Hazard	Consequence	Existing control measure	Current risk rating			Additional control Measure	Residual risk			Remarks
				L	C	R		L	C	R	





A standard format can be developed to assess risk and future record. Risk can be also calculated with the help of table matrix or other method as per respective state legislation, codes and company policy. Likelihood & consequence rating of event will be rated on based on Likelihood & Consequence/severity of hazardous event.

6. Risk Control Procedure

Risk can be reduced to control workplace hazard and unsafe acts. Workplace hazard can be controlled through hierarchy of hazard control method. Eliminate the hazard, Substitute the process or material, Engineering control method, Administrative control method & Personal protective equipment (PPE's) are steps used to control workplace risk and these steps are known as hierarchy of hazard control method. PPE's is last consideration because it doesn't eliminate hazard, it minimises severity of harm.

Education & Training, effective implementation of work permit / Lock out Tag out System, Effective Supervision, Emergency preparedness & Plan, Effective Reporting system and developing behaviour based safety culture play vital role to identify and control workplace risk. Risk can be controlled to reduce Likelihood of harm or Consequence of Harm or Both Together.

7. Conclusion

Hazard identification & Risk assessment is an effective technique used to control workplace risk. It is a proactive approach, so workplace risk is accessed and controlled earlier before happening any incident. In this Method we select activity, identify hazard and then decide likelihood of event & their consequence. If risk is high or more then we ensure suitable control measure to minimise risk up to Tolerable level. Person who has competence, knowledge about process or activity, knowledge about legislation & Codes, Good

Knowledge of hazard identification & risk assessment procedure can do risk assessment in suitable manner.

References

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- OSHA—Occupational Safety and Health Administration, "Occupational Safety and Health Guidelines," 2009.
- The Building & Other Construction Workers (Regulation of Employment and Conditions of Services) Act, 1996
- IS 14489 , Code of Practice on Occupational Safety & Health Audit"



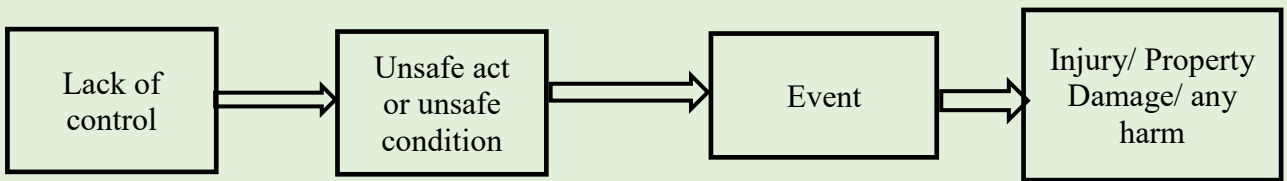


PRINCIPLE OF SAFETY MANAGEMENT

Safety Management begins with incident management. Accident occurred at site due to unsafe acts & unsafe condition. When both conjugate at one point then accident happened. In other words, Human and mechanical failure are causes of accident.

Committing mistake by person or Any act that may lead to accident is known as unsafe act. Working without wearing safety helmet & safety Shoes, Working at height without wearing full body harness, Taking Rest in working Areas, working or Taking rest below Hanging Load, Over speeding, Operating equipment without qualification or authorization, Lack of/or improper use of PPE, Operating equipment at unsafe speeds, Failure to warn, Bypass or removal of safety devices, Using defective equipment are few example of unsafe acts.

Any sources or situation or condition that have potential to create harm is known as **unsafe condition**. Damage welding Cable, Mechanical guard not Provided on rotating parts, Defective sling or lifting equipment, Defective work platform, Floor or platform Opening, Pits, Poor housekeeping, Defective tools, equipment or supplies, Inadequate supports or guards, Congestion in the workplace, Inadequate warning systems, Hazardous atmospheric conditions etc are few example of unsafe condition.



Accident prevention Method: Accident can be prevented to control unsafe condition and prevent unsafe practices. Risk can be minimised As Low As reasonable practicable (ALARP) to eliminate hazard or Isolate hazard or Substitute process/ material or Engineering control method or Administrative control method or to use of Personnel Protective Equipments (PPE's) or Two and more method together. This method is known as Hierarchy of Hazard control method. PPE's is last consideration because it not eliminate hazard. It minimise severity of harm.





HAZARD IN INDUSTRIES & HAZARD IDENTIFICATION PROCEDURE

Hazard in Industries

Different Types of hazard found in an industries as per their Nature. Following are major types of hazard:

- Fall of person due to poor workmanship, loss of balance, uneven surface, floor opening, poor work platform, working at height without using full body harness, Defective ladder or stair, slippery floor, Loose material in assess etc.
- Fall of material due to failure of lifting appliances, Tools & tackles, loose material keeping at edge on height or near floor opening, Poor method of Material lifting & shifting etc.
- Mechanical hazard (entanglement, contact with sharp edge, Ejection like chip and small particle emitting during grinding job.)
- Electrical hazard Like Fire, Electrocutation, Eye flash, Burn injury, Fall due to electrical shock.
- Fire Hazard due to hot job near flammable material, Inadequate storage of Flammable material, Poor earthing system of flammable material storage tank, Smoking.
- Physical Hazard like heat, Poor illumination, Cold,
- Environmental hazard like dust, fumes, Gases, NO_x, SO_x, Noise
- Ergonomical hazard includes repetitive movement, manual handling, workplace/job/task design, uncomfortable workstation and poor body positioning
- Chemical hazard like dust, fumes, gases create central nervous system problem & respiratory problem due to exposure and create skin problem when come in its contact.
- Vehicle movement may cause of hit to person, Hit to object or Collision or topples

HAZARD IDENTIFICATION TECHNIQUES

Hazard in an Engineering Industries is identified by following Method.

- Safety Inspection
- Checklist based Inspection
- Hazard identification & Risk assessment (HIRA) Techniques
- Job safety Analysis (JSA)
- Safety Audit
- Safety Survey
- Accident/ Incident investigation
- Hazard operability study (HAZOP)
- Operational Hazard Analysis (OHA)
- Construction hazard analysis (CHA)
- Fault Tree Analysis (FTA)
- Event Tree Analysis (ETA)
- Environmental monitoring
- Safety Sampling
- Safety Tour

• What if Analysis

• Failure Mode Effect Analysis (FMEA) etc

All procedure of hazard identification will be discussed in next Journal.





Training Calendar

ISE (India) Training Calendar (October-2018 to December-2018)

Training Title/ Course	Duration	Schedule	Location	Remarks
ISE-SM (Safety Management at work place)	3 day or Min.24 hours Training	05/10/2018 to 07/10/2018	Raipur	Exam Date 07/10/2018
First Aid	1 days	30/10/2018	Raipur	
Lead Auditor ISO 45001:2018	5 day	05/11/2018 To 09/11/2018	Raipur	Exam Date 09/10/2018
ISE- ICCOHSEM (International Certificate course in Occupational Health Safety &Env. Mgt.)	Min. 96 hours Training	03/11/2018 to 10/11/2018	Raipur	Exam Date 11/11/2018
Workshop on Safety Management In Engineering Industries	2 days	16/11/2018 to 17/11/2018	Raipur	
ISE-SM (Safety Management at work place)	3 day	28/11/2018 to 30/11/2018	Raipur	
ISE- ICCOHSEM (International Certificate course in Occupational Health Safety &Env. Mgt.)	Min. 96 hours Training	15/12/2018 to 22/12/2018	Raipur	Exam Date 24/12/2018
Diploma/ Post Diploma in industrial Safety	One year	December 2018-19	Raipur/ Rampur	
ISE- IDOHSEM (International Diploma in Occupational Health Safety &Env. Mgt.)	One year	Last Date of Registration 04/02/2019	Raipur	Exam date 03/06/19 & 04/06/2019

IOSH, Risk assessment & Control, Behaviour based safety, chemical safety in industries, Safety in construction industries, Scaffolding safety, Petroleum & Gas industries safety, Ergonomics, Mock Drill, HAZOP study, Emergency planning, Disaster Mgt., Fire Safety, Environmental Mgt., EIA Like Training also conduct as per Need.

Note: Diploma Courses conducted twice in a year. December- January session known as winter session and June-July session is known as summer session.

For more details visit www.iseindia.in or mail info@iseindia.in Call [07509487141](tel:07509487141)

