

HSE -INTERVIEW QUESTIONS & ANSWERS

1. What is a Safety ?

Ans. - Safety is a system of working (to protect the people, properties and plant) in which manufacturing of substance is without loss of person and property.

Responsible for safety officer:-

The safety officer is responsible for ensure that all safety monitoring activities are conducted on a regular basis. The Safety officer will complete inspection of work activities in work area on a daily basis.

Some specific categories to be checked are as follows

- ✚ PPE
- ✚ Fire protective equipment
- ✚ House keeping tools & equipment
- ✚ Fall protection
- ✚ Excavation
- ✚ Scaffolding & ladders
- ✚ Permit safety task assignment
- ✚ Hoisting & lifting equipment

2. What is an incident ?

Ans. - Unexpected event resulting accident or nearmiss.

3. What is an accident & Nearmiss?

Ans. - An accident is undesired event caused by unexpected and unplanned activity that result is in harm to a person and damage to a property.

Nearmiss : Unexpected event no injury

Basic cause of accident.

1. Unsafe Act. (experience) – 80% accident occurs by man fault i.e. unsafe act UA.
2. Unsafe Condition – 20% accident occurs by miss management i.e. UC.

Type of injury and accident.

- a. Minor injury - Employee can be rest less than 48 Hrs.
- b. Loss Time Injury - Employee can be rest more than 48 hrs. / less than 72 hrs.
- c. Major Injury - Employee can be rest more than 72 hrs. / as soon.
- d. Fatal - That is death.

Classification of Accident.

A - Minor Injury, *B* - Lost Time Injury, *C* - All Road Accident / Fatal.

4. What is a hazard and how many type of hazard ?

Ans. - Something with the potential to cause Harm

Physical, chemical, biological, Ergonomic & Psychological

HAZOP - Hazop is versatile technique of hazard identification.

5. What is a Job Hazard Analysis ?

Ans. - A job hazard analysis is a technique that focuses on job task as way to identify hazard before they occurs. It focuses on the relationship between the workers the tools and the work environment. If identify uncontrolled hazard, we should take steps to eliminate or reduced them to an acceptable risk level.

6. Why is Job Hazard Analysis important ?

Ans. - To prevent workplace injury and illness by looking at our workplace operations establishing proper job procedures and ensuring that all employees are trained properly. One of the best way to determine and establish proper work procedures is to conduct a job hazard analysis is one component of the larger commitment of a safety and health management system.

7. What is a Risk ?

Ans. - Risk is a combination of the probability of occurrence of a defined hazard and its estimated gravity.

8. What is a Risk Assessment ?

Ans. - Risk Assessment is a process of examination of what work could cause harm to people, property and plant. We have taken enough precaution and control measure against the record the hazard.

9. What is a Risk Analysis ?

Ans. - Risk analysis is a method of take right decisions against of potential hazard.

- | | |
|---------------------------------------|---------------------------------|
| a. Hazard Identification. | b. Risk Assessment. |
| c. Risk Management. | d. Risk Communication. |
| e. Planning of work (Work Procedure). | f. Implementation & Evaluation. |

10. What is a Job Safety Analysis ?

Ans. - Job safety analysis is a method of identify and knowing about the dangers or hazard in the job. To take step of job and developing a solution for each hazard and eliminate or control the exposure.

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|---------------------|--------------------|------------------------------|
| a. Work Description | b. Crafts Involved | c. Basic Job Steps. |
| d. Risk | e. Serial No. | f. Recommended Job Procedure |

11. What is a Work Method Statement ?

Ans. - A document showing the various methods through which a particular work is accomplished. It also provides a section for the safety measure for that activities.

12. What is the use of Work Method Statement ?

Ans. - work method statement described the method in which a particular job is to be done. This can give complete awareness to the working crew. A JSA can be prepared based on the WMS. In effect, it helps to finish the job safety.

13. What is a Safe Work Plan ?

Ans. – A Safe Work Plan for each foreman and crew each day and submit it to his area manager for review and approval 24 hours prior to the start of work.

14. What is a Safe Action Plan ?

Ans. - Safety Action Plans are a basic procedure for analyzing a scope of work for hazards establishing abatement methods and assigning responsibility.

The five basic steps in developing a Safety Action Plan.

- a. Define the complete scope of work.
- b. Break the scope down to individual task.
- c. Identify the potential hazard and assessing the resulting risk.
- d. Eliminate or reducing the risk at the source. (where possible)
- e. Recommend safe procedures and identifying control standards to abate the residual risks.

15. What is a Safety Task Assignments ?

Ans. - This is procedure provides guidelines for all supervisors who assign work to employees. Safety Task Assignment is showing or explaining to each employee the safety application that pertains to the job he is to do. Management down through foreman to give STA assignments to all employees, either individually or in group.

16. What is a Work Permit ?

Ans. - A written document authorizing a person or a group to work perform shall be under the safety rules, regulations of the project and any operation or maintenance and construction work.

Type of permits that will be used on the project.

1. **Cold Work Permit** - It is a safe work activity or no ignition of work.
2. **Hot Work Permit** - Ignition of work as a welding, cutting, grinding etc. activity.
3. **Confined Space Permit** - Having limited access/egress and deficiency of oxygen.
4. **Electrical Hazardous Work** - Work on energized circuits/equipment gr.t. 50 volts.
5. **Hot Tap Permit** - Welding a hot tap connection onto a pipe/vessel installed.
6. **Line Break Permit** - Enter a pipe/equipment under pressure/contained product.
7. **Scaffold Permit** - A temporary safe work platform for employees to work at height.
8. **Excavation and trenching Permit** - Depression in the earth's surface/ earth removal.
9. **Crane Lift Permit** - To lift material and equipment by a crane.
10. **Man Basket Permit** - To hoist people an elevated position by a man basket.
11. **Elevated Work Permit** - Work being performed at an elevation above ground.
12. **Road Closed Permit** - To restrict traffic/access while work is in progress on the road.
13. **Grating Remove/Open Hole Permit** - Removal of installed grating.
14. **Night Work Permit** - Work are being performed during the hours of darkness.
15. **Radiography Permit** - The emission of atomic particles/electromagnetic radiation.
16. **Hazardous Energy Control Permit** - Electrical & instrument disconnect work.
 - a. **Opening** - Piping and Sewer to removing covers, breaking flanges.
 - b. **Blinding** - Installation of blinds into piping / flanged onto equipment/ close mechanical work.

- c. **Lock-out/Tag-out** - To prevent the energy and equipment being controlled by isolating device using the Lock-out or Tag-out is removed. .

17. Some Other Permit –

- a. Electrically Hazardous Task Plan/Permit.
- b. Request for Shutdown Electrically Hazardous Task.
- c. Notification of Hazard Electrical Work.
- d. Notification of Radiography.

Note: Permits pertaining to site access and material entry / exit are not included in this procedure. Other permits may also be required and will be developed as the need arise and communicated for implementation.

Recordkeeping : Contractor Safety Manager shall implement a numbering system for all permits, record all permits in a logbook and retain a copy of each permit of completed work. Records of permits shall be made available to Owner upon request.

17. How many types of Crane?

Ans. – Five types of Crane

- a Mobile Crane b Crawler or Hydraulic Crane c Tower Crane
- d Overhead Crane e Gantry Crane.

18. Major causes of Crane Accident.

- 1 Contact with live power line. 2 Overturns
- 3 Falls 3 Mechanical Failure

19. Who is at Risk ?

Ans. - 1. Operator 2. Persons at crane site.

20. How do accident occur?

- Instability – Unsecured Load, load capacity exceeded, Ground not level or too soft.
- Lack of communication - The point of the operation is a distance from the crane operator or not in full view of the operator.
- Lack of Training –
- Inadequate Maintenance or inspection -

21. What is Crane Hazards?

- Improper load rating.
- Excessive speeds (improper loads or speeds can result in the tripping of the crane).
- No hand signals (an illustration of the signals must be posted at the job site).
- Inadequate inspection and maintenance.

Unguarded Parts (Guarded moving parts such as gears or belt)

- Unguarded swing radius. And wind speed not more than 20 mile/hour.
- Working too close to power line (stay clear from power line at least 5 meter or 10 fits)
- Improper exhaust system and shattered windows.
- No steps or guardrails and walkway.
- No boom angle indicator and using outriggers.

22. Definitions of these ?

Crane - Consists of a rotating structure for lifting and lowering horizontally or rubber tires or crawler treads.

Hoist - Used to lift and lower load.

Boom - An inclined spar, strut or other long member supporting the hoisting tackle.

Boom Stop - A device used to limit the angle of the boom at its highest position.

Brake - To slow or stop motion by friction or power.

Block - Sheaves or grooved pulleys in a frame with hook, eye and stop.

Jib - Extension attached to the boom point to provide added boom length for lifting specified loads.

23. Important Point of Crane.

Operator Visibility - Make sure broken windows or other obstructions do not prevent the operator from seeing.

Ladders of Crane - Use ladders to get to the upper portion of the cab.

Guardrails - Runways and steps need to have guardrails, handrails and Slip resistant surface.

Suspended Loads - Don't stay under suspended load.

Boom Angle Indicator - A boom angle indicator must be on the crane.

Supporting Surface - Crane must be on a firm supporting surface & level within 1%.

Swing Radius - Stay out of the swing radius of the crane, Make sure there are barrier guards showing swing radius.

Sheaves - The groove must be smooth and free from surface defects which could cause rope damage.

24. Load Capacity – Speed – Warnings.

Make sure the crane operator can see the

- a Rated load capacity,
- b Operating speeds,
- c Special hazard warning or instructions.

25. Lifting Operation Procedure.

1. Lifting Procedure.

- A task Risk Assessment has been completed.
- Lifting equipment and lifting gear are certified.
- Load does not exceed or static capacities of the lifting equipment.

2. Lifting Operation Planning.

Weight of the load, Method of lifting, Working radius, Ground stability,
Communication system, Existing services (AG/UG), Height restriction,
Competent resources, Over head power line, Selection of equipment.

Ground Stability – When planning a lift, consideration must be given to the ground condition.

Outriggers – These should minimum of 3 times the area dimension of the outrigger pad and must be fully extended on both sides when performing a lifting operation.

3. Lifting Equipment - Chains, Slings, Shackles, Wire Rope.

4. Restrictions to Crane Operation.

Bad Weather – Wind speed more than 32 km/20 miles per hour (9mtr/second).

Over head Electrical Lines – Crane must be distance 5 meter+ (15 fits) from electric line.

5. Communication System - Proper communication between crane operator and rigger or banks man by visually signal or radio.

6. Color Code System - The color shall indicate to the user and the inspector that a

inspection has been performed within the project prescribed period.

Color -	Yellow	Blue	Orange	Green	Red	White
Month -	Jan/July	Feb./Aug.	Mar./Sept.	Apr./Oct.	May/Nov.	June/Dec.

7. Lifting Operation Checklist - The lifting operation check list acts as a reminder and guide lines to the personnel concerned and basically consists of the items shown below and listed in the lifting operation procedure.

26. Rigging Equipment Slings, Types of slings include alloy

- | | |
|----------------|--|
| a Steel Chain, | b Wire Rope,(Steel Core Rope, Pended Rope) |
| c Metal Mesh, | d Fiber Rope and Synthetic Web. |

Load Capacity of Wire Rope according to wire thickness.

1 inch wire rope = $8 \times (1)^2 = 8$ ton, and 2 inch rope = $8 \times (2)^2 = 32$ ton.

1 inch Fiber rope = $1 \times 1 = 1$ ton and 2 inch = 2 ton

Basic Boom = Top + Bottom = Total Capacity of Crane.

Boom Extension setup - 10 fit + 20 fit + 30 = 60 fit boom sequence.

1 Pound or Lbs = 0.450 gm and 1 kg = 2.21 pounds / Lbs.

SWL - Safe Work Load,

SLI - Safe Load Indicator,

PT-EL - Point To Earth Level.(Elevation).

27. Inspection of the Crane.

Inspection & Checklist- Crane should be check daily, weekly, monthly and annually.

Annual Inspection - Inspection of the hoisting machinery must be made by a competent person.

The employer must maintain a record of these inspections.

Remove immediately damage wire rope or defective slings from service.

Tire inspection - Conduct regular inspection of tires for excessive wear or damage.

28. What to inspection ?

- | | | |
|--------------------------------------|---|----------------|
| a Correct air pressure and no leaks, | b Tires properly inflated, | |
| c Clearance of tail swing, | d Wire rope wear, | e Fluid leaks, |
| f Physical damage to crane, | g Loose or missing hardware, nuts or bolts. | |

29. Training - Crane Operator

- Crane operator must be qualified on specific crane type.
- Crane operator must be include on the job training.

Supervisor / Competent Person - **Competent Person**

- If it needs fixing take it out of service and don't use it until is fixed.
- The competent person must inspect all machinery and equipment prior to each use and during use to make sure it is in safe operating condition.

30. Summary.

- a. Planning and training reduces accidents.
- b. Contact with power lines cause many accidents.
- c. A competent person must inspection a crane regularly to insure it is in proper order.
- d. Operators or others working in this area can be victims to "struck by" and "caught in" injuries.

- e. An unstable load, lack of communication, lack of training and inadequate maintenance or inspection are major contributors to crane accidents.

31. Planning Before Start-up.

- a. Level of crane and ensure support surface is firm and able to support the load.
- b. Contact power line owners and determine precautions, know the location and voltage of overhead power line.
- c. Know the basic crane capacities, limitations and job site restrictions, such as the location of power line, unstable soil and wind not more than 20 mile/hrs.
- d. Make other personnel aware of hoisting activities.
- e. Barricade area within swing radius and ensure proper maintenance & inspections.
- f. Determine surface area to store materials and place machinery.

32. Know the Weight of the Load.

- a. Refer to slipping ticket or other documentation.
- b. Ensure lift calculations are correct.
- c. Ensure load is within load chart rating for boom length and load radius of crane.
- d. Crane is rated by the maximum weight it will lift at a minimum radius and minimum boom length – the further from its center point, the less it will lift.

33. Load Limiting Factors.

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|--|--------------------------|--------------------------|
| 1 Not Level, | 2 Wind, (9 mt/hr x 18/5) | 3 Lifting over the side, |
| 4 Use of extensions, Jibs and other attachment, | | 5 On its wheels, |
| 6 Limits of wire rope, slings and lifting devices, | | 7 Side Loads, |

34. Mobile Crane Lifting Principles.

- | | |
|----------------------|-------------------------|
| 1 Center of Gravity, | 2 Leverage, |
| 3 Stability, | 4 Structural Integrity, |

35. Load Example – 30 ton Crane.

- a. Will lift 60,000 lbs (pounds) at 10 fit from the center pin of the crane.
- b. Based on level surface, no high speed wind and outriggers fully extended.
- c. At 25 fit from the center pin with an 80 foot boom, the capacity is only 14,950 lbs.
- d. At 74 fit from the center pin, the capacity is only 4,800 lbs (pounds).

36. Important Requirement of Crane Lifting.

- Method Statement and Risk Assessment (Only Engineering Lifting).
- Certified Crane Operator, Rigger (TUV certificate) & Crane (3rd part certificate also).
- Approved Rigging Study / Competent Supervision and Tool Box Meeting.
- Tested / Inspected & Color Code Tackles.
- Daily Crane Checklist.
- Firm & Level Ground.
- Wind Velocity (Weather Condition good).
- Slinger / Banks-man and Crane Load Chart.
- Check Over Head Electrical Line, Live System.
- Barricade or Sign Board of Lifting Radius Area.

- Do not Exceed Crane's Capacity and Over Ride Computer.
- Do not Touch the Load while Suspended.
- Do not Deviate from Rigging Study.
- Don't expose people to harm.

37. Crane Working Requirement.

1. Crane Operator must be having valid license, Third Part Certificate and Ownership Certificate and Insurance.
2. Rigger must be having TUV Certificate.
3. Lifting radius must be fully barricaded.
4. Outrigger Pad must be fully extended.
5. No body will be entered under the suspended load.
6. Crane lift must be present at site.
7. All Lifting Gears must be in good condition, certificate and color code according to month and inspected.
8. 32 Km / Hrs and above wind speed crane will allowed to work.
9. Rigger only will be the signal man and he will be in Reflected Vest.
10. Safety to the prevention of incidental loses or free from hazard and risk.

38. What is the Confined Space ?

Ans. – Any space have limited access or egress, accumulation, toxic gas, flammable contaminant and also deficient of oxygen in atmosphere.

- Limited access or egress, limited visibility and limited movement.
- Present flammable and toxic vapours.
- Space not designed for continuous employee occupancy.
- An area has limited or restricted means of entry or exit.

39. Which type of Confined Space.

Ans. – These are example of Confined Space.

Tanks,	Vessels,	Storage Bins,	Boilers,	Tunnels,
Pipeline,	Sludge Pits,	Exhaust Ducts,	Sewers,	Manholes,
Reactors,	Hoppers,	Coal Bunkers,	Sumps,	Trench,
Excavation / Trench depth more than 4 feet / 1.2 meters.				

40. What are potential hazards in Confined Space ?

Ans. – There are deferent type of hazards.

- Oxygen deficient atmosphere.
- Accumulation of flammable or explosive gas greater than 10% of its LEL.
- Accumulation of toxic gas equal to or exceeding its permissible exposure limit (PEL) or occupational exposure limit (OEL).
- Temperature (Extremes Heat and Extremes Cold).
- Engulfment Hazards and Electrical Shock.
- Any other atmosphere condition that is immediately dangerous to life or health.

1 Primary Hazards in the Confined Space.

a. Toxic Chemical

- Inhalation – Irritation of respiratory tract and damage to internal organs.
- Skin Absorption – skin rashes and attack internal organs.
- Ingestion or Swallowing – Pass through lining of the stomach or digestive tract.
- Signs & Symptoms – Irritation, Itching or Burning, Nausea or Dizziness and Difficulty Breathing.
- Identification – Air Sampling (PPM), Permissible Exposure Limit (PEL).

b. Flammables – (Residual Sludge or Liquid, Trapped Product, Solvent or cleaners).

Detecting Flammable, Sense of Smell, Lower Explosive Limit (LEL), Explosion Meter, 100% LEL – very hazard, Less than 10% LEL require for entry.

c. Oxygen Deficiency (Inert Gasses, Hazard of Nitrogen N₂, Corrosion Reaction)

Nitrogen –78% of the atmosphere by volume, Non detectable by any human senses.

Excess Deficiency – Oxygen level 23.5%, Fire Hazard.

2 Secondary Hazard in the Confined Space.

Slips, Trips and falls, Falling objects, Heat stress,
Electrical shock & burns, Engulfment, Welding or cutting fumes.

3 Hazardous Energy – Electrical, Mechanical, Hydraulic, Pneumatic and Thermal.

Control Hazard by – Isolation and Lock-out / Tag-out Device.

41. Who are the key worker of Confined Space ?

Ans. - Confined Space Key Workers.

1. ENTRANT – Those employees will physically enter the confined space to perform the work. They should be fully trained, certified and confined space entry card.
2. ATTENDANT - Hole watchman remains outside the confined space and monitors the entrants. He must be record the names of all persons as they enter and exit the confined space into the Log sheet in/out time. Attendant must be trained in his duty and wear red color vest.
3. SUPERVISOR – He is directly responsible for the work being performed in the confined space. He is qualified by training and experience person.
4. Authorized Gas Tester (AGT) – He is a competent person & authorized for check atmosphere test (Acceptors).
5. RECUE PERSONNEL – Anything happened in confined space Recue person will do recue activity.

42. What is checking before entry in Confined Space?

Ans. – 1. Check oxygen level, Flammable gas inside combustible liquid and Toxic substance. Oxygen level – 19.5% to 23.5%.

2. Use ventilation fans for remove inside air and supply by fans fresh air before one day.
3. Isolate all electrical supplies or energized system and use lock-out/tag-out system.
4. Gas checks to be conducted by using multiple gas instrument meter (Gas Tester) inside the confined space (Oxygen, Combustible Gas and Toxic Gas).
5. Operation field – Gas Testing, Permit Posing, Duration of Permits & Job completion.

43. What are requirement for entry in Confined Space?

Ans. – Provide safe means of access and egress.

- Provide adequate lighting, additional explosive proof torch light and electrical tools or equipment of double insulated and 24 volts or 110 volts AC with GFCI.
- Entrants attended the confined space training and holding the training card. Entrants have knowledge about symptom of exposure and dangerous situation.
- Proper communication between attendant and entrants by walkie talkie, verbally and visually every 10 minutes as a minimum. And proper as per require PPE.
- An approved work permit, method statement, JSA must exist and have been discussed all concerned the work and also confined space entry permit.

44. What is a Confined Space Job Safety Analysis?

Ans. - Performed for all confined space entries where hazardous material or conditions may be present.

- Isolation requirements and procedures.
- Hazard Control Method.
- Personal Protective Equipment requirements.
- Rescue Plan with trained personnel available in the plant.
- Any other special procedures, control or cleanup methods necessary.

45. Safety General Measure Control.

Conduct proper Risk Assessment, Require Permit to Work, Inspect the atmosphere, Ensure proper lighting, Inspect the PPE work will use, Learn the emergency procedures, Ensure fire precautions, Fill the confined space, entry log sheet, Install warning signs as necessary and Entrants shall wear a full body harness.

46. Piping Color of Gas line.

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|-----------------------------|---|--------------------------------------|
| 1. Blue color | - | Nitrogen (N ₂). |
| 2. Yellow color | - | Hydrogen Sulfide (H ₂ S). |
| 3. Pink color | - | Swing Elbows. |
| 4. Red color | - | Fire Water. |
| 5. Black color | - | Coke Ovens gas. |
| 6. Grey red band color | - | Blast Furnace gas. |
| 7. Grey yellow band color | - | LD gas (Bi product gas). |
| 8. Aluminum white color | - | Oxygen. |
| 9. Yellow red band color | - | High Press Nitrogen (H.P.) |
| 10. Yellow black band color | - | Low Press Nitrogen (L.P.) |
| 11. Orange color | - | Argon gas. |
| 12. Violet color | - | Ammonia gas. |
| 13. Sky blue color | - | Compress Air. |
| 14. Yellow red & blue band | - | Hydrogen gas. |

Chemical Safety

47. Categories of Hazardous Chemicals.

Corrosive, Flammable, Toxic, Reactive, Biological (Infectious of a disease), Carcinogen (Cancer – Causing), Radioactive.

- MSDS is available for a specific chemical distribute it to the class or read the information that applies.
- Must keep inventories of hazard chemicals and to determine which categories.

48. Physical States of Hazardous Materials.

Liquide, Solide, Gas, Vapor.

- Important for the user of chemical to know physical state can effect the routes of exposure and how can enter and harm the body.

49. How to handle Chemicals properly.

Use Cautions, Always follow procedure, Read all labels,
Keep yourself and the work area clean, Plan ahead.

- Handling chemicals safely involves a lot of common sense. Always use caution, Follow all the proper procedure every time and taking shortcuts could result in accidents.
- Before using any chemicals should read the container label (MSDS) the basic hazards and precautions associated with the chemical.
- Use proper PPE, Equipment and other items you need nearby.

50. Routes of Exposure.

Inhalation, Ingestion, Absorption, Injection.

These are the four primary routes of exposure.

- Inhalation is the common route because most chemicals are use in the liquid state.
- Ingestion can occur when eating and drinking after using a chemical.
- Absorption means evaporation through skin contact or mucous membranes.
- Injection usually occur by accidental or sharp injuries.

51. Symptoms of possible overexposure.

Eye Discomfort, Breathing Difficulty, Dizziness, Headache,
Nausea, Vomiting, Skin Irritation.

- Anyone suffer any of these symptoms while working with chemicals. Seek medical attention immediately report to your supervisor.

52. Incompatible Chemicals.

Flammables and Oxidizers, Flammables and any Ignition Source,
Acids and Cyanides, Storage Acids and Strong Alkaline,
Concentrated Acids and Water, Organic Solvents and Corrosives,
Corrosives and other Reactive materials.

- Severe consequences can result from mixing the chemicals of these event include.
Fire, Explosion, Chemicals Reactions, Release of Heat (Energy),
Splashing and Spattering, Degradation of Materials.

53. Agencies that Regulate Hazardous Chemical Storage.

OSHA - Occupational Safety and Health Administration.
NFPA - National Fire Protection Association.

EPA - Environmental Protection Agency.

DOT - Department Of Transportation.

- OSHA deals with the productive use of chemicals.
- NFPA deals with flammable and combustible chemicals.
- EPA deals with wastes associated with hazardous chemicals.
- DOT deals with the Transport of hazardous chemicals.

54. Handling Flammable Chemicals.

A. Keep containers closed when not in use.

B. Keep away from ignition sources.

C. Avoid contact with incompatible materials.

D. Only transfer to approved containers.

E. Clean up spills and dispose of waste properly.

F. Bond all receiving containers.

- Flammable chemicals are widely used in industry.
- It is important that use these chemicals understand storage and use requirement.
- Bonding receiving container will dissipate static electricity and prevent explosion.
- During any spill response, make sure only non sparking tools are used and any potential ignition sources are eliminated.

55. Proper Storage of Flammable Chemicals.

Ensure that storage areas meet regulatory requirements.

Replace all bung caps with drum vents after receiving containers.

Ground all drums properly.

Store only in small quantities.

Store quantities in approved storage rooms and cabinets.

- Make sure all storage container are approved for used with flammable materials.
- Grounding and venting are important for reducing the likelihood of fire or explosion.
- If barrels or drums are heated and build up pressures, they can blast off like a rocket.

56. General Safety Tips.

Never eat, drink and smoke while using hazard chemicals.

Use personal protective equipment as per required.

Make sure all chemicals container are proper labeled.

Always wash up after using chemicals.

- If you do not know what a chemical is , or have been trained to use it don't use it.
- Be sure to wash thoroughly with soap and water after using any chemical.

57. General Safety Tips (cont.).

To identify any chemicals, read the label and refer to the Material Safety Data Sheet. These tools will give you all the information you need to work safety with the chemical.

- Never smell or test a chemical to identify it.
- Know all emergency procedures and equipment.
- Always read label's MSDS prior to use.
- Store all hazardous chemical properly.
- Always use hazardous chemicals as intended.

58. Primary Container Labels.

Chemical labels give you basic information at a glance.

- Identify of the hazardous chemical.
- Appropriate hazard warnings.
- Name and address of the manufacturers or importer.
- Target organ effects – that could be harmed by using the chemical.

59. Secondary Container Labels.

- Identify of the hazardous chemical.
- Hazardous warning information.

Make sure that secondary containers are labeled with this information, so that the user can adequately trace the material back to original container for additional hazard information.

60. Handling Chemical Emergency.

- Know emergency phone number.
- Know how to control the spill.
- Know proper equipment shutdown procedure.
- Know proper evacuation routes and assembly areas.

They should evacuate the area and let someone else handle it.

61. What Emergency Personnel should know.

- Emergency cleanup and disposal measure.
- Required protective equipment. And use of cleanup equipment (i.e. first aid).
- Firefighting and other emergency measures.
- Use of other emergency equipment.

Even if outside personnel perform emergency services relative to chemical spill, must be followed that proper emergency procedure.

All non trained personnel should stay away from the emergency area.

62. First Aid Chemical in the Eyes.

- Don't rub the eyes and hold eyelids open & flush with water for 15 minutes.
- Be careful not to contaminate the other eye. And Seek additional medical attention.

This information can also be found on almost any MSDS for a given chemical. If you don't know first aid procedure or not trained. Don't attempt to perform first aid on a victim.

63. First Aid for Chemicals on the Skin.

- Flush area with lukewarm water for 15 minutes.
- Remove clothing and jewelry from burn area.
- Seek additional medical attention.

Point out emergency chemical wash station and inform to first aid trainer.

64. First Aid for Chemicals Inhalation.

- Move victim to fresh air area and get immediate help.

65. First Aid for Chemicals Ingestion.

- Induce vomiting only if told to do so by poison control.
- Get immediate medical attention.

Give out the number of poison control in your area. Be sure employees write it down and post the number in plain sight as well.

66. Color Identification.

Red - Flammability, Yellow - Reactivity, Blue - Health, White - Special.

67. Role and Responsibilities.

- The Environmental Superintendent and HSE Manager are responsible for the detailed application and implementation of this procedure.
- Employees should take care not to deface or remove warning labels from containers of hazardous chemicals.
- The labels must remain on the containers and remain legible at all time. Should promptly notify site supervisor of missing or deface labels.
- Employee shall not transfer a hazardous chemical from a labeled container to unlabeled, pail bottle or similar container. Shall not use unlabeled container chemical.

68. Environmental Field Officer Roles.

- All labels should be legible and prominently displays.
- Labels should be in English and other necessary languages.
- Labels for hazardous chemicals should peroxides the appropriate hazard warnings.

If you find any missing or deface labels promptly notify the site supervisor.

69. Project Specific Guideline and Principles.

- Employee access to MSDS shall be assured by having all MSDS for chemicals or mixtures in the workplace kept in a binder at the location of chemical storage.
- MSDS shall be arranged in the binder in alphabetical order.
- Empty drums and containers shall be disposed of in accordance with the waste management plan.
- Hazardous substances shall be stored in restricted access areas separate from all other substances.

70. Labeling and Handling Container.

- The MSDS shall be consulted to determine safe work practices and appropriate PPE prior to handling the drum or container.
- The container shall be properly inspected for damage, correct labeling and leaks.
- Ensure that all employees in the vicinity are aware of hazardous chemical being used.

71. Storage of Chemicals and Lubricants.

- Storage drums containing liquids shall be placed on a rack, not stacked.
- A separate rack shall be used for each type of material.
- Shall be no storage hazardous material in flood plains/within 50m of the water body.

72. Maintenance Facilities Storing Chemical and Lubricants.

- Areas of extensive lubrication oil transfer (as from drums to smaller containers with maintenance facilities) shall be provided with a drip tray.
- All container, drums etc must be properly disposed of in accordance with the Waste Management Plan.

Emergences.

- For spills, response procedures are contained in the spill Response Procedure.

Hydrogen Sulfide (H₂S)

Unit of Measurement for toxic gases like H₂S.

Volumetric Measure – 1% by vol. = 10,000 PPM.

1 PPM is Equal to

- 1 Ounce of sand in 31 tons (1 gram in 1000 kg).
- 1 Inch in 15 ³/₄ miles (1 mm in 1 kilometer).
- 1 Second in 11 ¹/₂ days.

An IDLH concentration of 100 PPM equals 0.36 inches on American football field.

73. Hydrogen Sulfide (H₂S).

- Acutely Toxic (Poison Gas). And effects respiration.
- Inhibits enzymes in the blood from using oxygen.
- Shuts down involuntary muscles that control breathing.
- Can cause death if inhaled in the right concentration.
- Colorless Gas – Can't see in a gas form.
- Heavier than air in pure (100%) concentration.
- When mixed with other gases, mixture may be lighter than air.
- Rotten egg smell - At low levels 15 PPM or less. May lose sense at 15 PPM or less.
- Very Corrosive - Will cause corrosive of metals. (sulfide stress cracking, Iron sul. Scale)
- Soluble in water and petroleum hydrocarbons.
- As fluid temperature rises more H₂S is released from solution.
- Flammable (3 times that of methane) 4% to 45% by volume. 40,000 to 450,000 PPM.

74. Where do you find Hydrogen Sulfide (H₂S).

- Oil & Gas – from Exploration to Refining.
- Sewer System, Chemical Plant, Pulp & Paper

75. How does Hydrogen Sulfide (H₂S) Effect you.

The way H₂S affects you depends on these factors.

- Duration (Amount of time of exposure).
- Frequency (number of time exposed in a day).
- Intensity (concentration of H₂S exposure in PPM).
- * Warning – Do not rely on your sense of smell to detect H₂S. *

76. Physiological Effects.

- Eye Irritation, Mild Headache, Nausea Dizziness, Irrational Behavior.

77. Permissible Exposure Limits (PEL)

- OSHA - 10 PPM, OSHA - 20 PPM Ceiling, 50 PPM Max – Peak (10 minutes).
- NIOSH - 10 PPM Ceiling, ACGIH - 10 PPM PEL – TWA.

Protective Breathing Apparatus must be worn when working in an area where H₂S level exceeds the 10 PPM PEL.

78. Hydrogen Sulfide (H₂S) is Flammable.

- Flammable range is 4.0 to 45% by volume.

- Ignition temperature is 500° F. And pure H₂S burns with blue flame.
- Burning Produces SO₂ (also very toxic and heavier than air).

79. Special Health Problems.

- Emphysema (abnormal dilation of air spaces, distention of walls).
- Bronchial Asthma, Heart Disease, Diabetes, Eye Infections,
- Alcohol Consumption, Anemia (low red blood cells, hemoglobin or volume)
- Psychiatric Problems, Smoking.

80. Protective Breathing Apparatus.

- Escape Unit – Plastic Hood, Minimum 5 minutes, Escape only.
- SCBA – Work or Rescue, Maximum Mobility, Escape use 30, 45 and 60 minutes rated units typically found. And actual time may vary based upon individuals.
- Work Unit – Airline (cascade system) use. 5-15 minutes Escape Bottle, limited mobility.

81. Problems with SCBA Use.

- Facial Hair (beards & long sideburns), Contact Lenses,
- Corrective Spectacles, Punctured Ear Drum, Psychological Disturbances,
- Other Sealing Problems – Scars, Hollow temples, Prominent cheek bones, Deep Skin creases, Lack of teeth, Dentures.

82. Rescue Procedure.

- Put on Self Contain Breathing Apparatus rescue unit.
- Remove victim to fresh air – Go upwind or crosswind.
- If breathing, maintain victim at rest and have trained personnel administer O₂.
- If not breathing, start artificial respiration. And transport person to doctor or hospital.
- Keep person lying down and keep warm. If eyes are effected, wash with clean water.
- Do not return to work until cleared by a doctor.

83. Detecting Hydrogen Sulfide H₂S.

- Portable Monitors – Continuous Single gas personal monitoring. Audible / Visual / Vibrating Alarms. Multi Gas Monitoring.
- Fixed Monitors – Central Controller, Remote Sensors, Siren & Strobe Alarms.
- Detector Tubes – Measured by length of stain, Fairly Accurate, Takes Time, Sport Checking, Many Gases and High Concentrations.

84. Safety Measures.

- When Approaching Jobsite – Observe “condition” signs & warning alarms, Check wind condition, Look for personnel and their activity, Enter jobsite slowly, Locate assembly point / Safe area.
- Minimum of two escape route. And continuous monitoring.

85. Safety Measures – cont’d.

- Eliminate ignition sources and enforce “NO SMOKING”.
- Conduct emergency drills.
- Forced ventilation can reduce H₂S exposures risk.
- Observe wind direction – More upwind or crosswind from source.

- Avoid low lying area – Pure (100%) H₂S is heavier than air.
- Use the “Buddy System”. Maintain and observe warning signs.
- Post emergency numbers, maintain communications system.
- Locate emergency stations at least 250 fits from H₂S source.
- H₂S can be flared (Produces SO₂). And know your company’s H₂S.

SAFETY STANDARDS

1. Helmet	-	Z - 89.1	1981	(ANSI)	*	5240 (BS)
2. Safety Glass	-	Z - 87.1	1968	(ANSI)	*	2082 (BS)
3. Safety Harness	-	Z - 359.1 & Z 10.14		(ANSI)	*	1397 (BS)
4. Safety Shoes	-	Z - 41.1	1967	(ANSI)		
5. Respirator	-	Z - 88.2	1992	(ANSI)		
6. Safety on Scaffolding	-	A - 10.4	1988	(ANSI)		

Explained the following.

➤ ANSI	-	American National Standards Institute.
➤ ASTM	-	American Society for Testing and Materials.
➤ ACGIIH	-	American Conference of Governmental Industrial Hygienists.
➤ APR	-	Air Purifying Respiratory.
➤ ASR	-	Air Supplying Respiratory.
➤ ASBA	-	Air Supply Breathing Apparatus.
➤ AL	-	Action Level.
➤ BS	-	British Standards Institute.
➤ COSHH	-	Control Of Substance Hazardous to Health.
➤ OSHA	-	Occupational Safety and Health Administration.
➤ OHSAS	-	Occupational Health and Safety Assessment Series.
➤ NIOSH	-	National Institute of Occupational Safety & Health.
➤ ELCB	-	Earth Leakage Circuit Breaker.
➤ GFCI	-	Ground Fault Circuit Interrupter.
➤ SWL	-	Safe Work Load.
➤ LTI	-	Lost Time Injury (Incident).
➤ JSA	-	Job Safety Analysis.
➤ LEL	-	Lower Explosive Limit.
➤ UEL	-	Upper Explosive Limit.
➤ PEL	-	Permissible Exposure Limit.
➤ REL	-	Recommended Exposure Limit.
➤ PSI	-	Pounds / Square Inch (1 Bar = 14.7 PSI)
➤ STEL	-	Short Term Exposure Limit.
➤ STARRT	-	Safety Task and Risk Reduction Talk.
➤ SCBA	-	Self Contained Breathing Apparatus.

- STA - Safety Task Assignment.
- WBGT - Wet Bulb Globe Temperature.
- RSO - Radiation Safety Officer.
- NFPA - National Fire Protection Association.
- HSE - Health, Safety and Environment.
- PT-EL - Point to Earth level. (Elevation)
- TLV - Threshold Limit Value.
- TWA - Time Weighted Average.
- IDLH - Immediately Dangerous to Life or Health.
- AAS - Area Air Samples.
- BAS - Blank Air Samples.
- TDS - Total Dust Samples.
- PAS - Personal Air Samples.
- EA - Exposure Assessment.
- IA - Inorganic Arsenic.

What is a scaffolding.

Ans - Scaffolding is a temporary & movable work platform for working at height.

Do it.

- ◆ Confirm if the ground is slid, firm and level before erection.
- ◆ Make use standards are sitting on the sole board and base plate.
- ◆ Ensure ledger is level.
- ◆ Ensure the transoms are level and fitted correctly.
- ◆ Make sure boards sit flat and firm on the scaffold.
- ◆ Verify if toe boards are fitted to all side of the scaffold.
- ◆ Make certain that handrails are fitted to all sides of the scaffold.
- ◆ Ensure the tie off points of the ladder (top and bottom).
- ◆ Maintain the step off point of the ladder (1meter above landing place).
- ◆ Ensure fitting is fastened correctly.
- ◆ Scaffolds inspection shall be done by a competent person only.
- ◆ Scaffolds must be inspected at the time of erection.
- ◆ Use green tag scaffold only.

Don't.

- ◆ Do not use the damaged fittings.
- ◆ Do not use incomplete working platform and with missing boards.
- ◆ Never allow big gaps in the platform allowing materials /personnel to fall through.
- ◆ Do not use bent standards(post).
- ◆ Do not use boards with cracks and splits or other form of damage.

- ◆ Do not use damaged ladder.
- ◆ Never use the incorrect fittings.
- ◆ Do not allow to use non-inspected scaffolds after the scaffold has been modified.
- ◆ Do not allow use of scaffolds without inspection after bad weather.
- ◆ Do not use red tag scaffold.

ROLES OF FIRE WATCHER

- Watch out for fire hazards in the workplace while work is performed by other employees.
- Maintain the conditions and requirements stated on the safety permit.
- Keep flammable materials from ignition sources.
- In the event of fire, extinguish it immediately or turn a fire alarm on.
- Call emergency contact number.
- Stop operations if you find any hazardous condition.

Any condition in the workplace, whether usual or unexpected, determines your basic duties as a fire or safety watch. Some of them are the following:

- Make sure you and other employees are aware of the exact location of fire fighting equipment in the immediate area.
- Maintain constant means of communication.
- As much as possible, keep visual and voice contact with other employees.
- Before and during each shift, inspect the entire work area and look for potential release of flammable vapors or liquids.
- Be prepared to operate fire extinguishers, hydrants, fixed monitors, and hose carts anytime.
- Never leave the job site while the work is being done. If you have to leave, stop the job and notify workers that you are “standing-by-for”.
- When all operations are done, do not leave the worksite unless you’re sure that there are no hot sparks, burning embers and other fire hazards. Return all fire fighting equipment to their original location.

ROLES OF HOLE WATCHER

The role of the attendant is designed around three core factors: Knowledge and understanding of the hazards, monitoring of the confined space, and rapid response to emergencies. As such, you can’t afford to entrust the confined space attendant duties to an untrained hole-watch.

Indeed, the attendant plays a significant role in reducing fatalities by:

- Assessing the risks inside and around the confined space
- Controlling and monitoring access to the space

- Keeping strict records of the confined space activities and situation, including personnel entry and exit, air test results, etc.
- Monitoring entrants as they enter and exit the space to promote their safety
- Monitoring atmospheric conditions in the confined space before and during entry
- Requesting emergency assistance if needed