HSE Procedures Manual Table of Contents(PRS)

Contractor management competencies, roles and responsibilities

Modify All current and future contracts for contractors/ sub-contractors by adding pre-selection criteria of the contractor toinclude:

- Required skills, experiences andtraining
- Submit medical checkup (MC) report & submit drug test every 3-6 months includingsupervisors
- A day off every six workingdays
- Minimum specialized trainings for WAH technicians andsupervisors.
    - Electricsafety
    - Firefighting training
    - Permit to work system(PTW)
    - Training for Supervisors:
    - RiskAssessment
    - Inspect/ accept scaffolds according to CFR 29 OSHA Part 1926standards
    - FirstAid
- Comprehensive safety induction *
- Worker's records must contains the dates of Medical checkup and trainings and training passing dates and must be signed by the LDC HSE department" and must be made available on sites at any time for review.
- Revision of the hiring procedures to all the LDCs and the sub-contractors of the LDCs
- *** (the safety induction is different than the TBT that carried out on site before task starts, it is a training session designed to teach employees about worksites activities, organization, emergency procedures, rules, policies, hazard and incident reporting requirements and any other aspects related to company operation's hazards and risks)**

Alcohols andDrugs

- It is forbidden for all employees / Contractors to have any type of alcohols or drugs while working.
- In addition, it is forbidden for all contractors, sub-contractor workers to have any type of alcohols or drugs whileworking.
- It is not allowed for any worker (EGAS, contractor, or sub-contractor) to enter the working site if he is found under the effect of alcohols or drugs.
- A periodic analysis is done for all drivers to be sure they are not under the effect of alcohols or drugs whiledriving.
- All personnel who do not obey the above statements will be punished according to local law of labor no. 12 for2003.

Auxiliary Workshops

- Isles should be clean & free from any obstacles or materials & the workshop should be free from any litters or unused tools orequipment.
- Litters & unwanted materials should be put in special containers and get rid of it as quick as possible according to its hazardouslevel.
- The specified workers should do using or repairing equipment ormachines.
- Switch off electricity after finishing work onmachines.
- Workers carrying, lifting loads, or heavy weights should pay attention and ask for help in case of overloads & try to use any lifting device as much as possible.
- Do not clean or wash equipment or machines with benzene or any other quick flammable material, but if necessary use kerosene or solar and avoid clothes being wet by benzene orsolar.
- It is forbidden to store quick flammable materials in opened containers or in any other places not specified for this purpose. Take all safety precautions.

Working on Lathes

- Use protective glass & avoid wearing rings, gloves, any hands accessories, large or toreclothes.
- Check that all gears & belts are covered before startingwork.
- Fix the work piece properly before fixing the cuttingtool.
- Remove the wrench after fixing the work piece in thetable.
- Do not ever try to calibrate the cutting tool or to touch the work piece during latherotation.
- Do not leave any wrenches on the lathe duringrotation.
- Changing the chuck should be donemanually.
- Remove the chip by the correct brush &not byhands.

Mechanical Drill

- Do not ever hold the work piece by hand under the drill but use a suitable vice for drilling small work pieces & fix the work piece in the table for drilling huge workpieces.
- In case work piece gets out of the vice & rotates with the drill, do not try to stop it by hand but stop the machine immediately.
- Keep the chuck key & the wedge away from the drill before it starts to rotate.
- Do not keep the tools, the oil can, and the brush behind the drill.
- Remove the chip by the brush & not byhand.
- Do not wear gloves & take them off before the drill is start in gup.

Hand Tools

- Always check the tools & keep it in a good condition changing the spoilt ones & repairing others needed to berepaired.
- Tools should be used in its specified purposesonly.
- Do not use short pieces to elongate wrenches; short pieces are only used with large wrenches designed forthis.
- Screwed wrenches or wrenches with movable jaws should be completely & perfectly holding pipes & nuts & keep the pulling direction always the direction of the movablejaw.
- If you have to leave handy tools in high places, do not leave them on the ground or on walking isles in order not to fell on any one below.
- After work, clean the tools repair the spoilt ones & keep them in a safe place in a safeway.

Grinding Stones

- R.P.M. should be written on the grindingstone.
- Trained & specialized workers only can work on grinding stones.
- Protective barrier should be fixed over the grinding stone.
- All workers should use theP.P.E.

Batteries Handling

- Wear your safetygoggles.
- Wear your (gloves–apron–safety shoes) for protection against acids.
- Any sparks, flames, and smoking areforbidden.
- Children are forbidden to be nearbatteries.
- Emergencies
    1- In case the acid is reached to the eyes, you must wash it with fresh water several times and see thedoctor.
    2- In case the acid is reached to the skin, you must wash it with fresh watergently.
    3- In case of swallowing the acid, you must drink a lot of milk and water and see thedoctor.
    4- In case of acid poisoning, go to hospitalinstantly.

Storage of Batteries

- Batteries must be kept standingvertical.
- Even there is a tightly closed cover but the static charges could be discharged if the battery is turneddown.
- The overreaching of moisture is leading to quickdischarge.
- The production date must be on thebattery
- The storage of batteries must be organized to let which come first to be used first and vise versa.
- The stored batteries must be inspected 3 times in ayear.

Colour Coding

A- According to international organizations of OH&S for specifying the colors used for warnings to risks in which to avoid, also all employees must know about these colors and the purpose, which used for.

B- Color Applications

1- *Red color* : the main color for specifying:

a- Fire extinguishers and firefightingequipment.

b- "Danger" written in red and put in dangerous areas, also labeled on barrels containing flammable liquids having a flash point equal to or less than 80ft.

c- "Stop" written in red on electrical buttons or switches used for stopping machines inemergencies.

* Red lights areused on barricades and in construction areas.

2- *Orange color*: it is the main color for identifying the dangerous parts of machines that can make harm such as cutting, electricshocks...etc.

3- *Yellow color* : it is the main color for warning of physical hazards like crashing, falling, ….etc., it can be used only or use the yellow color as a slides from yellow and black with 2" thickness or yellow and black squares with 3" for making attention.

4- *Green color*: It represents the positions of first aid places and personal protectiveequipment.

* If the first aid facilities is large you can use a green cross "+" on a white background.

5- *Blue color*: It is used for warning signs while starting an operation or using or moving any equipment undermaintenance.

6- *Violet color*: the main color used for warning of radiationhazards.

a- Violet and yellow colors are used for signs, labels, and ground marks for warning of radiation hazards like X-rays, α-rays, β-rays, γ-rays, and neutron, proton, deuteron, and meson rays.

7- *Black and white colors*: black & white combination is used as a traffic signs and signals; also, it is used as signals instorage.

8- You can use boosters with approved colors instead ofpaintings.

9- Classification of colors and signals:

1- Thefollowingsymbolsareusedforcolorblindedpersons: a-

Danger marks: red square in propersize.

b- Danger equipment: orange equal triangle in a propersize.

c- First aid and safety equipment: green cross "+" on a white background.

2- The physical hazards must be specified carefully and painted to warn all employees from arised risks.

Dealing with Gas Pipelines

At commissioning a gas pipeline there should be precautions taken for Safety & firefighting & to protect these lines from corrosion, miss-operation & wrongs from others. In addition, there should be an emergency plan to be applied in case of any emergency.

1- PipelineInspection

Periodic inspection on pipelines using leakage equipment at steady intervals according to written & fixed regulations & programs including work procedures & reports declaring any changes along the pipeline with a width of 6m along on each side. Reports shouldinclude:

- Pipeline cathodicprotection.
- Excavation works & equipment used init.
- Construction & buildingworks.
- Ignition sources.
- Destructive & explosive works usingexplosives.
- Gas leakageindications.
- Pipeline bare partscondition.
- Erosion in water path bridges, ways &railways.
- Condition of Pressure reduction stations & valves & their components.

Coordination with other authorities (Electricity – The other utilities – ways – Railway – Land owners) and anyone may do any works could affect pipeline safety and this could be achieved by sending annual letters reminding them of pipelines locations & regulations for them to follow if they intend to do any works in gas pipelinearea.

Regulations Include

- Sending a memorandum from the authority intending to do the work (one-week at least prior starting work) to the owner of the gaspipeline.
- Presence of gas pipeline inspector duringwork.
- Indicating work path correctly before startingwork.
- Entering isles should be available for pipeline repairingequipment.
- Any excavation by any mechanical equipment should be at least 3 meters away from pipeline path otherwise excavation should be manual for less than 3 meters away frompipeline.
- Never use explosives unless applying explosives expert regulations for gas pipelinesafety.
- Do not use pile machines unless it is completely safe for thepipeline?
- Limitation of welding & any ignition sources except after checking absence of gasleakage.

2- Gas PipelinesMaintenance

It is important to take all precautions for gas pipelines safety to avoid any damage or corrosion to pipeline & this by maintaining its components & testing its working efficiency periodically & this could be done by:

- Proactive Maintenance of gas pipeline & itscomponents.
- Periodic Maintenance of gas pipeline & its components according to specified procedure & to be done by specialized & qualifiedpersons.

3- Gas Pipelines Maintenance Records

- Periodic inspection regulations – periodic maintenance of all pipeline components – proactive maintenance – emergency plan – Safetyregulations – persons & authorities contacted on emergency cases – valves and vents locations & shortest ways to reach them.
- Periodic inspection reports - periodic & emergency maintenance reports – proactive maintenance reports – Repairingreports.

4- EmergencyPlan

Should be written by the transmitting or distribution gas company showing the responsibility of every team or individual in case of any fracture or defect in the pipeline or in case of any leakage or emergency, the plan should also include the role of firefighting, police, civil defense & governmental authorities. The plan should also indicate how to act at the following:

- Gas leakage from a pipeline-crossing river Nile or any water pathindicating the used equipment & the qualified laborers that can beused.
- Gasleakage.
- Gas pipelinefracture.
- Pipeline fire orflame.
- Training on the plan by applying periodic practical experiments & modifying it to avoid any disadvantages init.
- Coordination between the company & the other companies working in the same field owning equipment that could be helpful at emergencycases.

Dealing with Chemicals

- Before dealing with any chemical, read its safety instructions to know its hazards & how to deal safely withit.
- Check the presence of a sticker on the package showing the components & how to deal safely with thechemical.
- Be sure that the package is perfectlyclosed.
- Determinethedestinationplacebeforetransportingthechemicalpackages.
- Supply tap water or washing water in place ofhandling.
- Use the P.P.E (rubber gloves – Helmet – glasses – Safety shoes - …….etc.) & avoid any flame source beside or near handlingarea.
- Use manual pumps in case of transporting flammable chemicals from one place to another, and in case of using electric pumps it should be explosion proof.
- During opening of the chemical packages, be careful not to be exposed to the vaporsofthechemicals&closethepackagesperfectlyifnotusingthem.
- Filled packages should be separated from the emptyones.
- Itisforbiddentousetheemptychemicalpackagesforanyotherpurposes.
- Empty packages should be stored in the appropriate scraparea.
- Coordination should take place with society protection sector to get rid of the expired chemicalssafely.
- When emptying a chemical package try not to leave any residuals inside as much as possible to eliminate the probability of the chemicals being spilled out of the emptypackages.

Driving

- The car / vehicle must inspected daily and before starting engine as the following:
  - Inspection of coolingliquids
  - Engine oillevels.
  - Brakes oillevels.
  - Power steering oil levels (ifavailable).
  - Clutch oil levels (ifavailable).
  - Inspect alllights.
  - Inspect all tires and spare tyre.
  - Inspect all cartools.
  - Hydraulic oil levels (ifavailable).
  - Inspection of hydraulic oil leakage (ifavailable).
  - Inspection of fire extinguishercondition.
- Driver has to keep paying attention to the road in front ofhim.
- Driver should be patient & decent withothers.
- Try not to use the horn as much aspossible.
- Lights for turning (Left & right) should be started by an enough time before turning specially if it is raining or if the streets are slippery which makes it harderforothervehiclestostoportoturnawaytoavoidyourvehicle.
- Driver has to allow other vehicles to pass beside him & avoid obstructing them.
- Driver has to avoid following other vehicles as well as not to stop just before or after any curve or turn on theroad.
- Start using the brakes with enough time & distance before the place you want to stop the vehicle at to make stopping smooth &gradual.
- Slow down the speed at any strange condition or circumstances on the road or on expecting anydanger.
- Always keep on driving within the speed limits of the road you are driving on & never exceedit.
- On night driving, driver should always turn on the ordinary front lights & try not to use the high front lights as much as possible so as not to disturb other vehicles moving in his direction or at the oppositedirection.

- Driver should pay attention & drive slowly in case of driving unfamiliar vehicles or vehicles in badcondition.
- Driver should be smart enough to expect actions & reactions from others before itoccurs.
- Avoid using brakes at road crossings except in emergencycases.
- Avoid any gear transmissions in turns or crossings & do it before getting into the turns orcrossings.
- Speed should be decreased to a safe limit before reaching any turns by enough time & this enables the driver to accelerate during turning & after thesituation is clear in front of him, & viceversa.
- Driverhastouse&dependonthevehicle'sinteriormirror(histhirdeye).
- Concentration is very essential during driving & do not pay attention to anything but the road & never look at anything else such as an accident on the road while your vehicle ismoving.
- Driver has to hold the steering wheel with both hands except when transmitting the gears or giving a turning flash, steering wheel should not be holded also from its center or just by thefingers.
- Driver should not rest his left leg on the clutch except during gear transmissiononly.
- Driver should always concentrate & do nothing but driving (such as to eat, drink, use the mobilephone, or to fix any thing in front of him).
- Do not follow any person's sign to go on or to cross the road but be sure yourself from the road being clear& safe before crossing or going on.
- Do not ignore any sign from anybody meaning "Stop" or "Danger" and it is preferable to stop & see what is the problem instead of keeping going on & being a part of an accident or aproblem.
- Avoid driving fast on slippery roads or if it israining.
- Pay much attention to fogs on foggydays.
- Never drive without driving license or vehicle's license or with an invalid licenseof.

Dealing with the Odorant

- Be careful during handling or transportation of odorant barrels to avoid falling of any barrel.
- During barrel transportation using vehicles, fix the barrels properly to avoid its shaking orfalling.
- Cover the barrels to protect them fromsunlight.
- Appropriate fire extinguishing equipment of the odorant should be available &existing.
- Adequate quantity of the sodium hypochlorite substance or any equivalent substance should be available for use in case ofemergency.
- In case of any odorant spilling, spilled area should be surrounded by, sand & then apply the equalizer substance (Sodium hypochlorite or its equivalent).

Precautions during Storage

- Odorant barrels should be stored in a cool & well-ventilated place & away fromsunlight.
- Try to empty the barrel from the odorant during filling as much as possible before the barrel isexecuted.

Remark

- It is completely forbidden to use empty barrels for any other purposes.

Note:

- Reference should be made to odorant SDS to define Permissible exposure limits (PEL –TWA & PEL- STEL)
- Worker exposure should not exceed Ceiling permissible exposure limits (PEL-C) that mentioned on odorant SDS
- Occupational Exposure Limit for Spotleak to all components is 0.5 ppm, and the long-term "MEL" should be below 0.5 ppm (8 hrs. "TWA").

Excavation

- Supplying &Wearing P.P.E for allworkers.
- Supplying all necessary equipment for securing the site (lamps – warning marks – traffic cones – warning tapes…..etc)
- Co-ordination with traffic to secure workingarea
- Check the ground type (Sandy, muddy, rocky) before startingwork.
- Use the appropriate equipment to the groundtype.
- In case the depth of the excavation exceeds 6 feet, the following should be followed:
  - Put wooden supports at excavation sides or incline the excavation with an angle not exceeding30º.
  - Removetheexcavationproductscontinuouslytotheappropriateplaces.
  - Excavation products should be put at least 1m away from thetrench.
  - Supervisors should not stand very close to the trenchsides.
  - All the company vehicles & equipment should always be opposite to the wind direction & in the exitdirection.
  - Trench should be supported by wooden or steel supports to avoid excavation collapse due to violations in case of being beside roads for heavy trucks or railways.
  - Lighting lamps & warning marks especially at any road inclinations or deep turns should surroundexcavation.
  - In case of any probable hazards to any building excavation should be stopped &forbidden.
  - Wearing phosphoric jackets in case of nightworks.
  - During backfilling, be sure there areno individuals or equipment inside.
  - Be sure that the backfilling is clean sand free from stones or any sharp edgedsolids.
  - Put marker tapes after backfilling & replace any damaged tape at the same place.
  - Do not shift any cable inside except under supervision of the responsible utility.

Electric Works

- It is completely forbidden for the unspecialized workers to try to repair any connections, fuses, electrical devices or to touch wires or electrical devices & in case of any electrical hazards; Responsible persons should be informed immediately.
- Before working in any electrical devices or connections switch off electricity and make the necessary methods of warning to prevent any person from switching on electricity duringwork.
- Check the existence of earthing in the used electrical devices.
- Handling parts of the electrical tools & equipment should be insulated properly.
- Electrical wires & cables should be stored away from high temperature sources orplaces.
- Steady maintenance should be done for tools & electrical wires taking all thenecessary precautions & testing these tools to ensure itssafety.
- Do not throw electrical wires or any objects over wires or electrical equipment.
- Keep electrical wires away from temperature, water oroils.
- Do not use electrical tools in case of working in a medium of flammable gases unless it isfireproof.
- In case of any electrical injury, take the injured person away from electrical circuits by switching off electricity from the nearest key, and if it is not possible to do, the injured person could be pulled away from electrical circuits by using any insulated tool like a rope or a piece of dry cloth & begin making artificial breathing to himimmediately.

Important Warning in Case of Fire

- Do not use water or the foamy substance in extinguishing equipment & electrical devices fires as it may shock its user, but only use:
- CO2 extinguisher - Dry chemical Powderextinguisher
- Use the suitable P.P.E. as electrical insulated gloves, insulated rubber carpets & electricity determiningdevices.
- Check the insulation of the electric switches board unless there is a document ensuring the insulation of theboard.
- Use electrical shock safety belt during working at highaltitudes.

Forklift

- Only trained and qualified personnel are allowed to operate the forklift, the supervisor specifiesthem.
- Inspect all alarms, siren before using the forklift; also, it must have a back alarm.
- Inspect brakes (foot brake – hand brake), mirrors and be sure there is no leakage of hydraulicoils.
- It is forbidden to lift any worker on forks to reach the upper shelves.
- In case of lifting worker by the forklift, the worker must be in a secured cage.
- If the materials lifted are affecting your vision, you must drive very slowly.
- Avoid sharpcurves.
- Be sure the forklift is notoverloaded.
- The distance between forks and ground must be not more than 20cm and not less than 10cm while liftingmaterials.
- Do not use forklift for personstransportation.
- You must take the doors height before passing throughdoors.
- Do not get your body outside the cabinet whiledriving.
- Do not leave the forklift with engine running and go somewhere else. If you had to go somewhere, and then stop the engine, put forks touched to ground, pull hand brakes and remove contact key beforeleaving.
- Wear your PPE gloves–safety shoes–helmet–overall).

Fire or Leakage in Oxy–Acetylene Cylinders

Fire in Gas Hose

- Close cylinder valve or regulator or squeeze the hose after folding until closing thecylinder.

Fire in Regulator

- Fight the fire with water or dry chemicalpowder.
- Close the cylindervalve.

Leakage from Cylinder Valve

- Close cylindervalve.
- Put valve cover & tight itclose.
- Put the cylinder in a well-ventilated area and far from any heat source.
- In form your direct supervisor to send the cylinder to factory or supplier.

First Aids

1- The undesired persons must stay away from the patient.
2- Observe the breathing is not stopped.
3- Call the police immediately in case of injury.
4- Call the doctor immediately in case of injury.
5- Prepare all the needed staff for first aid like bandages….etc.
6- You must cool down the patient from the nervous shock.
7- In case of complete unconsciousness – leave the patient until doctor is came, taking into account warming him. (The reason may be from poisonous food, brain bleeding, metal poisoning, or increased glucose in blood in case of diabetic patient or may be decreased glucose in blood after taking a large dose of insulin – you must observe the patientbreathing).
8- inspect the patient physically and aid him as:
   a- Record the injury date, ask him if he can be asked, a physical inspection must be done accurately, and if he in a complete unconsciousness which doesn't represent the patient is dead or a life, he must be treated as a life till the opposite is verified.
   b- In bleeding cases, you must working on stopping that bleeding by all availablemethods.
   c- in case of bone brake – the patient is aided bytemporary
   d- Take care with patient suffering from nervous shock, give him hot drinks and warmhim.
   e- Transportation of the patient to the nearest hospital must bedone.

Snake Bites

Symptoms

Blood accumulation in the infected organ – unclear vision – inflammation – diarrhea – swatting – headache – increased temperature – vomiting.

Cure

- Youmustknowthetypeofbitinganimaltoknowhowtotreatthebite.
- Tight up the infected organ upper the bitted area but take care that tighten is not affecting the blood stream. The aim of that tighten is to decreasethepoisonenteringthebodyuntiltakingthepropermedicine.
- Observe the patient until going to thehospital.

Call a clinic

You must ask help in case anyone is exposed to snake bite and you think it may be toxic, especially when the symptoms appeared, also you must know

the time factor is very important and call emergency for preparing poison treatment unit until the patient reaches it.

First aid

- Try to cool down the patient and make the infected organ down the heart to decrease the flow of poison to other parts of body.
- If you have a pipette like (soyer), you can use it as stated in the manufacturer instructions.
- Release any rings or accessories because infected organ may be swelled.
- If the infected organ is colored or swelled the snake often to be poisonous.
- Observe the patient biological indicators such as temperature, breathing, blood pressure,….etc.
- Call a doctorimmediately.
- Fetch the dead snake if that would not risk you to injury and do not try to hunt a life snake. Be careful of snakehead it can bite even if it isdead until an hour from itsdyeing.

Safety

- Even if most snakes are not of poisoning type you must avoid touching or playing withsnakes.
- Several serious bites happened when the person himself is reacting with snakes on purpose.
- When you are coming to an area, which you know, that may have a snake you must wear a long shoes andpants.
- Avoid the snakes hiding places like trees branches, under rocks….etc.
- A small knocking with a stick you can do before entering unknownarea thus snakes will avoidyou.

Note: not all types of snakebites need the antitoxins and do not take any antitoxin unless from the qualified clinic, also if you have the antitoxin take it with the patient to the doctor because antitoxin may be very harmful.

In case of snakebites or suspect snakebites, you must call 123 immediately or transport the patient to hospital.
Note: every site manager must search about nearest hospital that has the antitoxins of snakebites.

Followed Procedures in Case of Work Site Injury

- The work supervisory (engineer or foreman) fill the injury form and transport the patient to the nearest public hospital or nearest medication center specified by the company for making first aid if he can be transportedandifnotyoumustcallanambulancetotransporthim.
- The injury form must be sent to HSEdepartment.
- HSE officer will make the work related injurydocumentations.
- The patient must go to the work related injuries center in the health insurancefacility.
- A copy of work related injury document will be sent to police station forrecording.
- The HSE department must be informed about the treatment finishing of thepatient.

Housekeeping

- Most of the accidents & injuries result from uncleanliness & disorder at worksites despite they could be overcame by fewefforts.
- Cleanliness & ordering means keeping materials, tools, devices & equipment clean & in goodcondition.
- Cleanliness & ordering is a daily responsibility of all the workers & is not done when there is available time to doit.
- Isles & passages should be always clean & free from any materials, tools or any equipment to avoidaccidents.
- Work is not considered to be done completely except after cleaning & ordering tools & materials and the site is in goodcondition.
- Drills & sharp tools should be stored & kept in a suitable place as being a source ofhazard.
- Any oil, water or any slippery stains should be removed & cleaned at once.
- Litters & work residuals should be collected & removed currently & do not accumulatethem.
- Materials, tools & equipment belonging to work site should be stored &kept inasafe&suitableplaceandawayfromworkareauntilbeingneeded.
- Nails, wires or cables should be removed immediately from working area or tobewellfixedso asnottobeasourceofanydangerorinjury.
- Materials that will be accumulated should be tied to prevent it from falling down.

Hot Tapping Safety Precautions

- Gas flow rate in the main pipe should be calculated before starting the tapping (Min. gas velocity is 0.3 - 1m/s).
- Leakage saddle with appropriate diameter should be available at site before starting the welding in case of anyemergency.
- Work site should be secured during & after excavation by using warning marks, traffic cones, lighting lamps and a suitable barrier around the excavation place could bedone.
- All emergency equipment (fire extinguishers, vehicles...etc.) should be available at site before startingwork.
- Civil defense could be formerly informed with the place &time of the hot tapping to be ready for any help or rescue ifneeded.
- Smoking is completely forbidden during welding & drilling around work in a circle of 40 mdiameter.
- Purging an inert gas like nitrogen inside the joint (valve + branch) to ensure absence of any leakage and for the drilling process to proceed in an atmosphere of an inert gas (non-explosive).
- Be sure to reach the correct excavation depth & put the marker tape correctly according to thespecification.
- Do not ever leave the excavation opened under any circumstances in case of not finishing the job in one day or in onenight.
- Training & informing all the people in charge at the work site of how to act & respond in different emergencycases.

High level monitoring and evaluation

- LDCs should monitor compliance with Safe Systems of Work (SSOW) requirements.
- Audits conducted to ensure the SCAP is in place and to capture any deviation within its implementation.
- EGAS will evaluate OHS performance of all LDCs according to the SCAP and to include all documentations in quarterreports

Lock-out / Tag-out Procedure

First, you must be sure of:

All locks and keys are numbered.

1- Keep the locks and keys in places easy toreach.
2- A spare key for each lock must be saved in specified places for emergency useonly.
3- Lockout process must submit to work permit system in presence of work supervisor and safety officer and it will be as the following:

- *First Step : Preparation andInforming*
  - BEFORE starting any of maintenance processes you must be sure of powertypes
  - Used for that equipment and all resultant hazards arises from it and informall
  - Workers about the shutdown of this equipment to start the lockout / tagout process.

- *Second Step: EquipmentShutdown*
  - Follow the work procedure or manufacturer's instructions for shutdown of this equipment taking into account that some equipment have a special procedure for shutdown like automatedequipment.
  - Be sure all power sources are identified and turned off (some machines may have more than one source of energy so you must ensure that all sources areshutdown).

- *Third Step: EquipmentIsolation*
  - Be sure of equipment isolation (turn off the main switches, valves and operationlines).
  - For complicated equipment, you must refer to manufacturer's instructionsforallpointsofisolationlikeswitches,valves…etc.

- *Fourth Step :Informing*
  - Each worker responsible for maintenance process must inform the worker responsible for the equipment shutdown – also workers on this equipment must have their own keys & locks of thatequipment.

- If there is more than one person in the maintenance process then there must be a multi-stage shutdown devices which facilitate each worker to make his own lockout / tagout process to prevent any other worker to operate the machine accidentally while his colleagues are working on it.
- Release any pressure from springs or equalize the spin parts movements.
- Chain any keys, switches… etc. that may be moved while operation mode ison.

- *Fifth Step: TestingEquipment*
  - To be sure that all power sources are switched off and remaining power in the equipment is discharged you must keep people away from that area then test all operating switches to ensure that all power is shut-down and switches can't be moved to operating mode.
  - Be sure all equipment parts are secured likechains…etc.
  - Be sure all electrical circuits have a zero volt inpotential.
  - When you are actually sure that all power sources are shutdown, locks and tags are in place, then it is safe to start the maintenance process.

Lifting & Loading Works

- Only specialized & qualified workers work on cranes &levers.
- Check & test cranes & levers before startingwork.
- P.P.E should be used in all loading & downloading works as well as in transporting heavy equipment.
- Primary testing for cranes before usage isimportant.
- Loading & downloading works should be done at the presence of the responsible loadingsupervisor.
- Use safe methods for loading &downloading.
- Avoid being between the vehicles rear & any other near object &avoid downloading objects in the direction of the standingpersons.
- The loading supervisor & report the check & keep it documented should do periodic check on levers at leastmonthly.
- Check lifting equipment before usage & declare the defected ones & change them.
- Maximum loading weight should be written & clear on thecrane.
- Do not ever make the cranes, wires, chains or ropesoverloaded.
- The crane driver should know exactly the weight of the load he is going to carry, and if no the should deal with it as more than the estimated weight.
- It is forbidden for anyone to pass or stand under the loaded weights, and the crane workers should not permit anyone to be over the crane or lying under the crane duringwork.
- Check the crane hook & that the load is in the Wright position before loading.
- At lifting, the hook should be at the vertical position above the C.G. of the load to be lifted so that it becomes stable, also check that the load is free from anyobstacles.
- Pulling chains or ropes on the ground isforbidden.
- It is forbidden to hold chains or ropes when lifting loads & stand away from the liftedloads.
- Choose the correct locking stud to lock thechains.

- Protect chains, ropes & wires from the sharp edges & acute angles of the load by using soft woodencushions.
- Do not use ropes in lifting solid loads with sharpedges.
- Do not let the ropes or wires touch any hotbody.
- Do not ever knot wires or ropes when lifting to shorten the wire or rope or even to round the wire or rope around the hook of the crane.
- Do not use single woven rope between the hook & the load as it might surfeit from turning around itself duringlifting.
- In case of using double or branched ropes or wires, choose wires or ropes with adequate lengths & that the load is equally distributed on the ropes or wires.
- When finishing the loading & unloading return all the tools &equipment to thestores.
- In case of crane movement take from any electric cables obstructing the crane.

Using of Fire Extinguishers

Industrial Safety Responsibilities

- Co-ordination &Co-operation with different sections to know the sight demand from the suitable extinguishingequipment.
- Maintenance & ordering of the fire extinguishers to facilitate its use in emergencycases.
- Checking that all workers are trained how to use fire extinguishers with their differenttypes.
- Fixing fire extinguishers against the walls by specialholders.
- Supplying suitable warningdevices.
- Inspecting fire extinguishers periodically refilling the empty & repairing thedefected onesimmediately.
- Informing workers of fire hazards & checking the safety of the sight at the end of each workingday.
- In case of using any fire extinguisher, industrial safety should be informed at once with a written report indicating fire circumstances or the reason of the fire extinguisher beingused.

Precautions against Fire

- Supplying a suitable manual or automatic warning device to fasten evacuating the place from workers in case of fire or anydanger.
- Supplying good communication between the different work sections at sight as wells as between the management &the public firefighting locations to call them in case of any fire or any suddendanger.
- Never doing any works that result in existing a flame or high temperature in any flammable buildings like wood or plastic unless their walls & ceilings are lined with thermal insulatingmaterials.
- Operations resulting in existing a flame or high temperature should take place in separate places away from working or storing places of flammable or explosive materials in addition to supplying suitable extinguishingdevice.
- Flammable or explosive materials such as fuels or burning materials should be kept in suitable stores & preferably to be lower than ground level &to have strong, tough and hard walls & ceilings and to be anti-explosionand

thermally insulated, well ventilated to allow lowering the temperature inside the store as well as to decrease the concentration of gases & vapors that could be dangerous for either human health or from being flammable or even for both reasons.

- Classification of materials inside the stores & its proper organization & supplying suitable methods to load it & to transport or move it &prevention of mixing chemical materials that can react with each other & avoid it being spilled on theground.
- Well organization of materials inside the store to avoid falling, breaking or spilling of materials or theircontainers.
- Electric key switches of stores of flammable materials should be located outside the store & if necessary to be inside the store, then it should be anti- spark type (oil keyswitch).
- Choose the suitable method to get rid of the work residuals or litters whether it is solid, liquid or gaseous to avoid any probability of fire, explosion or any health hazards to anyone of theworkers.
- Earthing of any electrical devices or any materials may contain any static charges isnecessary.
- Do not use shoes with nails from below or to hammer with any metallic instruments that could lead to spark inside places that may contain any flammable or explosive vapors orgases.
- Water pipes, gas pipes or electric cables should be buried underground &tobe covered properly to protect them against fracture, fire or being spoilt in addition to the electric switch keys to be placed outside working area for the easycontrolofswitchingoffelectricityorshuttingdowngasorwater.
- Lighting should have separate electric cables than cables of machines & equipment in order to be capable of switching off electricity without cutting offlightstofacilitatetheexitofworkersincaseofanyemergency.
- Presence of adequate isles between machines & in the stores to facilitate the movement of persons & materials and to facilitate exit of persons on any emergencycaseaswellasreachingfirefightingequipmenttoanyplace.
- Presence of adequate entering & exit doors free from any obstacles & at the ground level and to put clear marks showing the leading ways to the nearest exits in case of any fire or emergency atworkplace.
- Presence of reserve ladders for workers at higher floors to use them in getting downincaseofanyfireinthebuildingorinthemainstairs.

Vehicles & Equipment Extinguishers

- Industrial Safety has to determine type & capacity of extinguishers required for every vehicle orequipment.
- Stores have to issue extinguishers to vehicles & equipment drivers as a personal compact responsibility.
- Co-ordination between stores, industrial safety, workshop & repairs to follow up the company demands from various types & capacities of vehicles & equipment fireextinguishers.
- Vehicle or equipment's driver has to check the presence & good condition of extinguisher when being delivered his vehicle orequipment.
- The driver has to introduce a written report to the industrial safety in case of usingafireextinguisherindicatingthereasonforwhichitwasused.
- Industrial safety has to refill used extinguishers taking the followed regulations.
- In case of losing an extinguisher, the driver has to introduce a written report indicating the reason of losing the extinguisher to the industrial safety whohas to replace him with another extinguisherimmediately.
- Training of the drivers is the responsibility of the industrial safety to show them how to use fire extinguishers in the vehicle or equipment.
- Periodical inspection on vehicles & equipment is done by the industrial safety to check the condition of fireextinguishers.
- Adequate stock of fire extinguishers with various types & capacities used by the company and indicated by the industrial safety is the responsibility of the stores to cover the demands of the new vehicles &equipment.
- Stores has to inform the industrial safety of the movement of fire extinguishersfrequently.

Manual lifting

- Do engineer manual lifting and lowering out of the task andworkplace.
- Well-trained workers should carry out lifting. If a worker is not used to lifting and vigorous exercises, he should not attempt to do difficult lifting or loweringtasks.
- Do think beforeacting
- Place material conveniently within reach. Have handling aidsavailable
- Make sure sufficient place iscleared.
- Do get a good grip on theload.
- Test the weight before trying to move it. If it is too bulky or heavy, get a mechanical lifting aid or somebody else to help, orboth.
- Do get the load close to the body .Place the feet close to the load. Stand in a stableposition with the feet pointing in the direction of movement.
- Do not twist the back or bendsideways.
- Do not lift or lowerawkwardly.
- Do hesitate to get mechanical help or help from anotherperson.
- Do not lift with the armsextended.
- Do not continue lifting when the load is tooheavy.

Team Lifting and Carrying

When two workers Carrey 1 object, they should:

- Workers should do test lifting before proceeding.
- They should adjust the load so that it rides level and so that each person carries an equal part of theload.
- When two people carry long sections of pipes or lumber, they should walk one behind the other. Shoulder pads will prevent cutting into their shoulders and will reducefatigue.

When a Team of Workers Carrying the Object

The supervisor should make sure that proper tools are used and should provide direction for the work. Frequently, whistle or direct command can single "lift", "walk", and "set down". The key to safe carrying by gangs is to make every movement in unison.

Jacks

When a jack is used, workers should do the following**:**

- Check the capacity plate or other marking on the jack to make sure the jack can support the load. if the identified plate is missing, workers should determine the maximum capacity of the jack and paint it on theside
- Inspect jacks before and after each use. When a jack begins to leak, malfunction, or show any sign of wear or defects, it should be removed from service, tagged, repaired, and tested underload.
- Wear protective equipment especially protectivefootwear
- Furnish toweling to jack operators for removing oils from their hands and from the jackhandles
- A heavy jack is best moved from one location to another on a dolly or special hand truck, if it has to be manually transported, it should have carrying handles.
- The operating handle should never be left in the socket while a jack is being carried because it might strike anotherworker
- Never throw or drop a jack upon the floor. Such treatment may crack or distort themetal.
- If the surface upon which the jack is placed workers should set the jack base on substantial hardwood blocking (at least twice the size of the jack), so that it will not turn over, shift orsink.
- Immediately wipe up spillage of any residual oil. To prevent the load from slipping, workers should avoid metal-to-metal contact between the jack head and the load. A hardwood shim should be placed between the jack head and theload.
- never use wood or metal extenders .Instead they should either obtain a larger jack or should place higherblocking

Hand Trucks:

Hand trucks fall into two categories: two-wheeled trucks and four-wheeled trucks .If used by workers who are not trained, trucks can be the source of the following accidents:

- Colliding with other trucks orobstructions
- Jamming hands and feet of operators between the trucks and otherobjects
- Running wheels of bridge plates orplatforms

Trucks should be pushed not pulled as this may lessen the stress to the lower back They should not be loaded so high that operators cannot see where they are going. For extremely bulky items or pressurized items as gas cylinders, strap or chain the item to the truck.

Operators should place the load well forward so it will not slip, shift or fall keeping the center of gravity of the load as low aspossible.

Odorant (Mercaptan) Empty Barrels Treatment Procedure

This procedure concerns a quantity of 550 ml of remaining odorant (Spotleak 1009):

- Remove the large bung and add 40 liter of clean water to empty 200 liter drum
- Add 250gm of a concentrated solid detergent to the water in the drum (the detergent is used to improve the sulfur compound solubility inwater).
- Add 19 liter of a 10% (weight) sodium hydroxide aqueous solution (NAOH) into the drum. The effect is to obtain the salt of the mercaptan used in large amounts in gas odorant blends. Those salts are soluble inwater.
- Insert the bung , agitate the content on the drum thoroughly , wetting all interior surface by up-ending the drum 2 or 3 times and rolling it approximately 3 meters forward and back.
- Place 13.5 liter of clean water in a clean plastic bucket or container, and gradually add 4.5 liter of a 13.14%sodium hypochlorite .that final solution will contain 3.79% in sodium hypochlorite. Always prepare a fresh solution to take advantage of its fullactivity.
- Remove the bung; add carefully the 18 liter of fresh bleach (sodium hypochlorite) solution to the drum using a large funnel to avoid splashes.
- Insert the bung and agitate the content of the drum thoroughly by rolling the drum approximately 3 meters forward andback.
- Place drum upright, let stand for 48 hours, then remove carefully the bung and carefully smell the content of the drum to determine if the gas odorant smell has beenremoved.
- If the gas odorant smell is still present, the amount of bleach was insufficient. Dilute 1.1 liter of bleach 13.14% of sodium hypochlorite in 8 liters of water, add those 8 liters to the drum. Continue from step5.
- Wear the properPPE.

Personal Protective Equipment(PPE)

Purpose

The Personal Protective Equipment (PPE) program has been developed to provide employees and workers with the necessary information to identify work situations that require the use of PPE, the proper selection and use of PPE, and documentation of this information.

Identifying Potential Hazards in the Workplace: (Hazard Assessment)

OSHA requires that employers should identify and assess the risks to health and safety present in the workplace, so enabling the most appropriate means of reducing those risks to an acceptable level to be determined.

Training

Prior to conducting work requiring the use of personal protective equipment, employees must be trained to know:

- When PPE isnecessary;
- What type isnecessary;
- How it is to beworn;
- What its limitations are;and,
- Proper care, maintenance, useful life, anddisposal.

Employers should provide appropriate PPE and training in its use to its employees.No charge can be made to employee for the provision of PPE that is used only atwork.

Selection, Use and Maintenance of PPE:

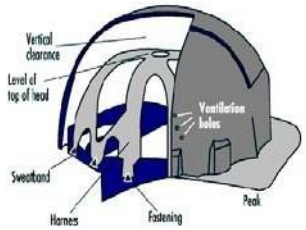
A- Head Protection:

Prevention of head injuries is an important factor in every safety program. Head injuries are caused by falling or flying objects, or by bumping the head against a fixed object.

Head protection, in the form of protective hats, must do two things:

- Resist penetration;
- Absorb the shock of theblow.

This is accomplished by making the shell of the hat of a material hard enough to resist the blow, and by utilizing a shock-absorbing lining composed of headband and crown straps to keep the shell away from the wearer's skull.



Hazards on Head

Electrical hazards

Falling objects or collision

Selection:

Each type and class of head protector is intended to provide protection against specific hazardous conditions. An understanding of these conditions will help in selecting the right hat for the particular situation.

Protective hats are made in the following types andclasses:Type1:

Helmets with full brim, not less than 1 and ¼ incheswide.

Type2:

Brimless helmets with a peak extending forward from the crown.

Type 1 –FullBrim

Type 2 -Peak

For industrial purposes, three classes of helmets are recognized:

Class A

These helmets are for general service. They provide good impact protection but limited voltage protection. They are used mainly in mining, building construction, shipbuilding, and manufacturing.

Class B

Choose Class B helmets if your employees are engaged in electrical work they protect against falling objects and high-voltage shock and burns. (Electrical workers use them extensively.

Class C

Designed for comfort, these light weight helmets offer limited protection. They protect workers from bumping against fixed objects but do not protect against falling objects or electric shock. (This class is usually manufactured from aluminum and offers no dielectric protection).

B: Eye and Face Protection

Suitable eye protectors must be provided where there is a potential for injury to the eyes for face from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, potentially injurious light radiation or a combination of these.

Types of Eye and Face Protection:

- SafetyGlasses
- SafetyGoggles
- FaceShields
- WeldingGoggles
- Laser SafetyGlasses



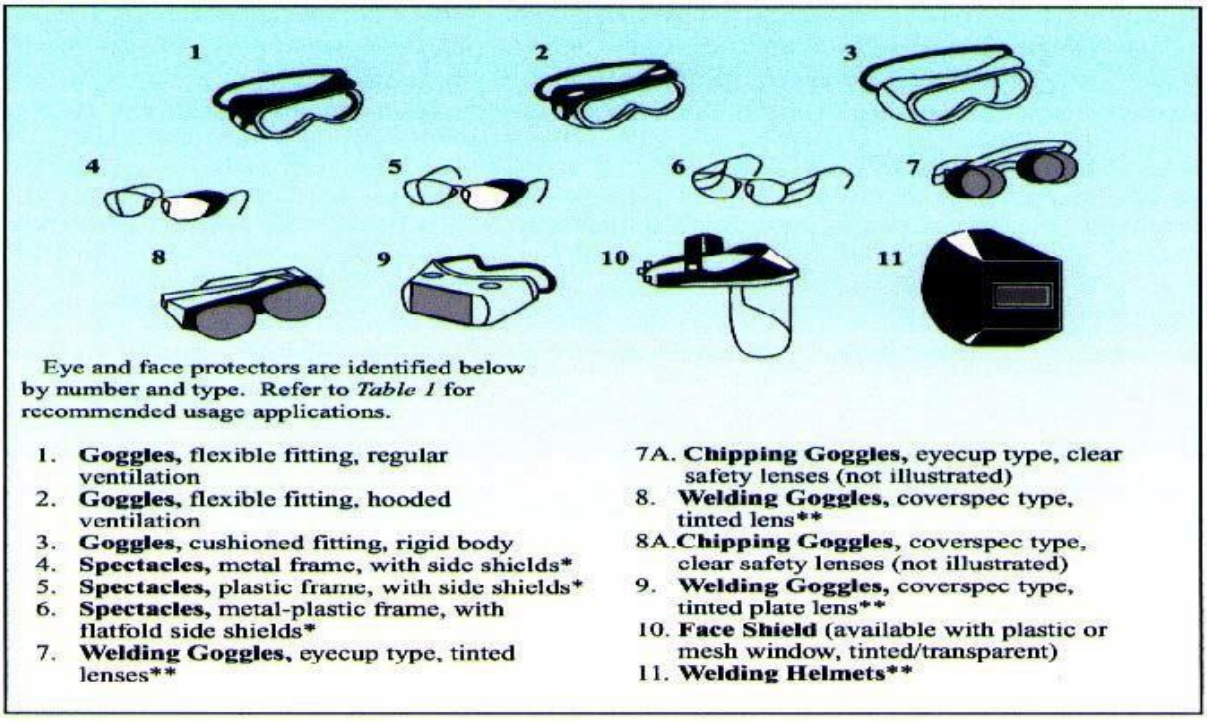
Selection:

Each eye, face, or face-and-eye protector is designed for a particular hazard. In selecting the protector, consideration should be given to the kind and degree of hazard, and protector should be selected on that basis.

Table 1. Eye and Face Protector Selection Guide:

Operation	Hazards	Recommended Protectors numbers refer to Fig 1
Acetylene-burning, acetylene-cutting, Acetylene-welding	Sparks, harmful rays, molten metal, flying particles.	7,8,9
Chemical handling	Splash, acid burns, fumes	2,10 (for severe exposure add 10 over 2)
Chipping	Flying particles	1,3,4,5,6,7A,8A
Electric (Arc) welding	Sparks, intense rays, molten metal	9,11 (11 in combination with 4,5,6 in tented lenses advisable)
Furnace operations	Glare, heat, molten metal	7,8,9 (for severe exposure add 10)
Grinding - light	Flying particles	1,3,4,5,6,10
Grinding - heavy	Flying particles	1,3,7A,8A (for severe exposure add 10)
Laboratory	Chemical splash, glass breaking	2 (10 when in combination with 4,5,6)
Machining	Flying particles	1,3,4,5,6,10
Molten metal	Heat, glare, sparks, splash	7,8 (10 in combination with 4,5,6 in tinted lenses)
Spot welding	Flying particles, sparks	1,3,4,5,6,10

Figure 1. Recommended Eye and Face Protectors



Source: 29 CFR 1926.102 (a)(5) Table E-1.
**These are also available without side shields for limited use requiring only frontal protection.*
*** See Table 2, Filter Lenses for Protection Against Radiant Energy.*

Table -2

Welding operations	Opacity
Alloy welding	2
Yellow copper welding	3 or 4
Light welding (till 1/8 inch)	4 or 5
Medium welding (1/8 – 1/2 inch)	5 or 6
Heavy welding (over 1/2 inch)	6 or 8
Light cutting (till 1 inch)	3 or 4
Medium cutting (1 – 6 inch)	4 or 5
Heavy cutting (over 6 inch)	5 or 6

Hearing Protection

Hearing protectors shall be made available and shall be worn by all employees exposed to an 8-hour TWA of 85 dB or greater.

Hearing protection equipment:

Its purpose to reduce the noise level to be lower the noise limits allowed in work place.

Hearing protectors will always have an assigned **Noise Reduction Rating (NRR), which** should be printed on the packaging of each hearing protector.

NRR is the amount of decibels by which a given device will reduce noise exposure, by subtracting the NRR value from the noise exposure levels.

OSHA requires subtracting 7 from the NRR as a safety factor.

1. EarMuffs

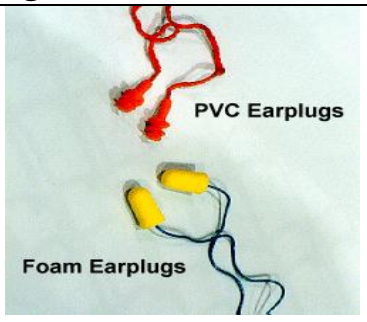
   It is covering the external ear, making a sound barrier and protect ear from high levels of noise where it can reduce it by 15 – 35 dB.

   It is used when noise in work place is 90 – 120 dB.

2. EarPlugs

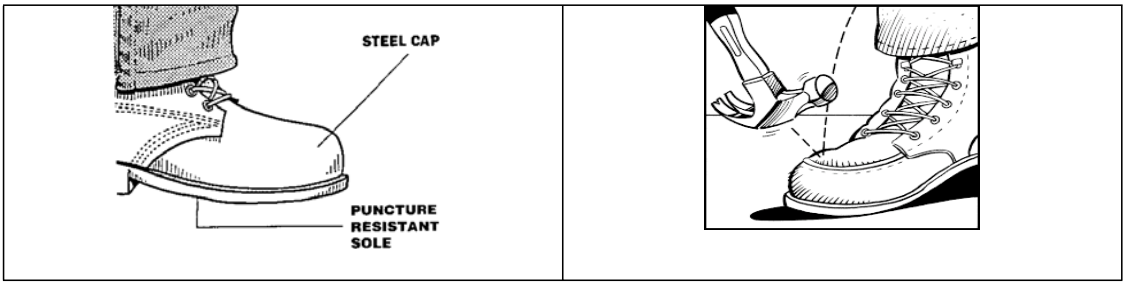
   Placed at ear canals and manufactured from plastic or rubber and can reduce the noise by 20-30 dB and used for places which have noise of 85 – 115 dB.

   In some places, which have a high level of noise, ex. 130 dB ear muffs can be used with ear plugs to reduce noise about 50 dB.



C: Foot Protection

Statistics showed that most of the workers in selected occupations who suffered foot injuries were not wearing protective foot-ware.



For protection of feet and legs from falling or rolling objects, sharp objects, molten metal, hot surfaces, and wet slippery surfaces, workers should use appropriate foot guards, safety shoes, or boots.

Safety shoes should be sturdy and have an anti-resistant toe. In some shoes, metal insoles protect against puncture wounds.

D-Respiratory Protection

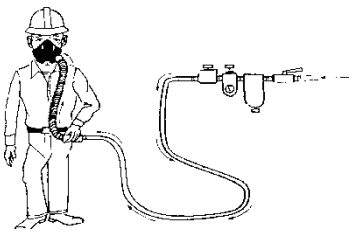
Respiratory protective devices fall into two classes:

1. Air Purifying Devices
2. Air SupplyingDevices

Air-supplying Devices

Air-supplying devices are the class of respirators that provide a respirable atmosphere to the wearer, independent of the ambient air ex. Self-contained breathing apparatus (SCBA)

Which provide complete respiratory protection against toxic gases and an oxygen deficiency. The wearer is independent of the surrounding atmosphere because he or she is breathing with a system that is portable and admits no outsideair.



Air Purifying Devices

The various types of air-purifying devices include:

- Mechanical-filtercartridge
- Chemical-cartridge
- Combination mechanical-filter/chemical-cartridge
- Gas Masks
- Powered Air-Purifying Respirators (PAPR)

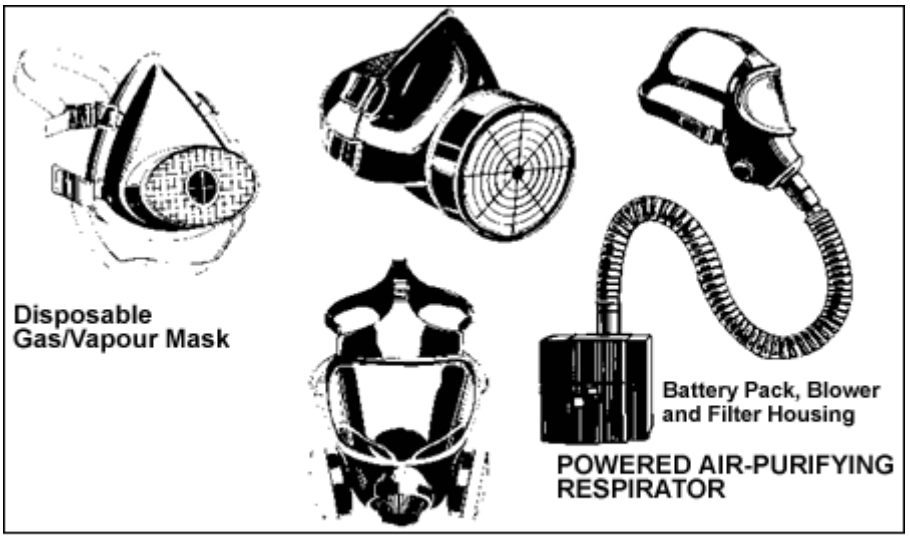


FIGURE 31
Air-Purifying Respirators

The air-purifying devices cleans the contaminated atmosphere. Chemicals can be used to remove specific gases and vapors and mechanical filters can remove particulate matters. This type of respirator is limited in its use to those environments where the air contaminant level is within the specified concentration limitation of the device. These devices do not protect against oxygen deficiency (percentage of oxygen by volume is less than 19.5 percent oxygen).

Proper Selection:

Respirators shall be selected based on hazards to which the worker is exposed. In selecting the correct respirator for a given circumstance, many factors must be taken into consideration:

- The nature of the hazard
- Location of the hazardous area
- Employee'shealth
- Work activity
- Respirator characteristics, capabilities, and limitations.

In order to make subsequent decisions, the nature of the hazard must be identified to ensure that an overexposure does not occur.

One very important factor to consider is oxygen deficiency. Air-purifying respirators can be used only at atmospheres containing greater than 19.5 percent oxygen.

Training and Fitting:

The user must be instructed and trained in the selection, use and maintenance of respirators. Every respirator user shall receive fitting instructions including demonstrations and practice in how the respirator should be worn, how to adjust it, and how to determine if it fits properly.

Fit Testing:

Fit testing is done to find both a style and a size of respirator that fits the individual best and is most comfortable. There are two types of fit testing: Quantitative fit testing and qualitative fittesting.

Field Testing:

Once the fit test has been performed and a respirator selected, the user should perform "field tests" on his respirator each time before entering the toxic atmosphere. These consist of both a negative-pressure test and a positive-pressure test.

These tests apply to respirators with either a cartridge, canister, or filter.

Negative-Pressure Test:

In this test, the user closes off the inlet of the canister, cartridge(s), or filter(s) by covering with palm(s) or squeezing the breathing tube; inhales gently so that the face-piece collapses slightly; and holds the breath for about 10 seconds. If the face-piece remains slightly collapsed and no inward leakage is detected, the respirator is probably tight enough.

Positive-Pressure Test

The positive-pressure test is conducted by closing off the exhalation valve and exhaling gently into the face-piece. The fit is considered satisfactory if slight positive pressure can be built up inside the face-piece without any evidence of outward leakage.

Medical considerations

The workers who must use respirators according to job nature must make a medical examination to eliminate individuals who are suffering from (chronic respiratory system diseases – cardiac diseases – difficult breathing diseases – hearingweakness).

Doctor specify the individuals who can use respirators and others who cannot according to the medical examination.

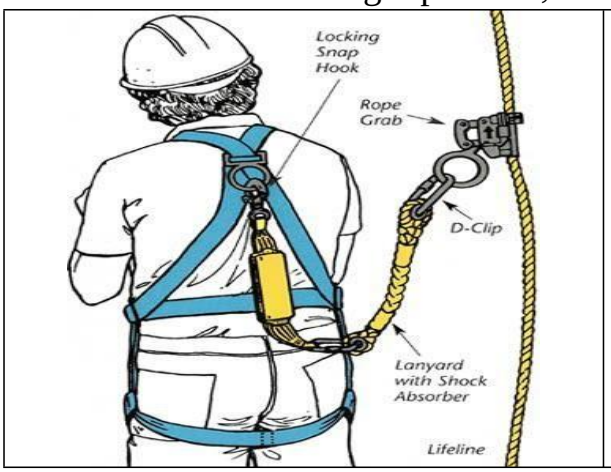
Cleaning and storage of respirators

- Disassembly the respirator parts and wash it with detergents, hot water and brush then wash the parts with cold water, after that leave the parts to be dried in a clean and dryplace.
- Do not use organic solvents in washing because it can damage the plastic parts.
- Be sure it is washed well with water and no traces of soap exists because it may make irritation to theuser.
- Storageofrespiratorsisdoneinacleanplaceforsavingfromdirtanddusts.
- After washing respirators, keep them in sealable plasticbags.

E-Safety belts and lifeline

They are used while working at heights for workers safety, also now using the parachute belts instead of regular belts.

In case of confined spaces working, use a safety harness and lifeline for getting the worker outside in a straight position, which eliminate injuries in emergencies.



F-Hand Protection:

Employees are required to use appropriate hand protection when their hands are exposed to hazards such as:

- Absorption of harmfulsubstances.
- Severe cuts orlacerations.
- Severeabrasions.
- Punctures.
- Chemicalburns.
- Thermalburns.
- Harmful temperature extremes(cold/heat).

Kinds of Protective Gloves:

Gloves made from a wide variety of materials are designed for virtually every workplace hazard. They may be divided into groups as the following:

1- Metal Mesh, Leather, or Canvas Gloves:

Sturdy gloves made from metal mesh, leather, or canvas provide protection against cuts, burns, and sustained heat.

2-Chemical-and Liquid-ResistanceGloves

Gloves made of rubber (latex, nitrile, or butyl), plastic, or synthetic rubber-like material such as neoprene protect workers from burns, irritation, and dermatitis caused by contact with oils, greases, solvents, and other chemicals. The use of rubber gloves also reduces the risk of exposure to blood and other potentially infectious substances. Some common gloves used for chemical protection are described below. (In addition, table 4 rates various gloves as protectors against specific chemicals.)

3-Heat resistanceGloves

These gloves provide protection against heat like steam pipes and hot glassware in laboratories or welding operations.

G- Body Protection

Overalls and aprons are used at working near machines or in workshops.

Plastic safety suits and coats are used for body protection against chemicals like acids and bases.

Painting Works(Paints–Solvents–Removals)

- Store in a separate place away from any chemical or oxidized substances.
- The store should be dry & well ventilated & the thinner should be keep away from any thermal source or the direct sunlight.
- Material should be treated as any flammable material in away that smoking or presence of any flame source isforbidden.
- In case of using electrical equipment in storage or transportation, they should be fulfilling the technical specifications in dealing with flammable materials.
- Materials should be kept in packages originally, of the same material you are going to keep.
- Do not use any unsafe method to get the chemical out of the package.
- Do not eat or drink in place of chemical handling.
- Keep away from any source of heat, spark or open flame during working with chemical.
  - **In case of Injury Due to Dealing withChemicals**
    - Respiratory system cases
      - Patient should be taken to a well-ventilatedplace.
      - Incase, respiratory system stops start making artificial respiration.
      - In case of unconsciousness, contact the doctor for consultancy.
    - Skin injury cases
      - Take off clothes contaminated withchemicals.
      - Wash the skin with soap &water.
      - Contact doctor in case of injurycontinuity.
    - Eye injury cases
      - Take off medical contact lenses iffound.
      - Wash the eyes with clean water for tenminutes.
      - Contact doctor in case ofnon-improvement.
- Use PPE (Respiratory mask–protective glasses) especially if the painting splash is heavy.
- In case of presence of opened flame, painting isforbidden.
- Do not store painting boxes or packages in place of work, but bring the needed only from thestores.
- Do not eat in place of work & painting workers have to wash their hands with soap properly before eating.
- Do not paint vehicles inside thegarage.

Purging

The inert gas used in purging media must have the following characteristics:

a) Inflammable.

b) Not supportcombustion

c) Contain less than 2%oxygen.

Inert gases most commonly used for purging are Carbon Dioxide, nitrogen, or mixtures of the two.

Notes must be considered in Purging Operation:

- Using blank behind valve to isolate the part of the pipeline, which will be purged from the part that will be inservice.
- The inert gas must be adequate andefficient.
- Devoid of purge, gas from moisture or other constituents, which might contaminate the material, protected?
- The vapors from enclosures being shall be vented to a safe point outside of enclosures and away from ignitionsources.
- After the completion of purging operation and the procedure of work which had been prepared and reaching to the end point, a test must be done to the air around the place of purging to ensure that there is no gases or condensate or leakage or any circumstances can lead to any chemical reaction can form combustible substances orself-ignition.

Vent Pipes

These pipes used to vent the gases present in the equipment to a point at which a dilution for these gases without any harm for the labors.

Therefore, it is advised that the lowest height for this joining is 3 m from the surface of the earth or from the nearest platform. also, the size of the vents is an important factor in identifying the speed of gas vented, and for safety the speed of the gas out from these vents at least (3- 4m/s) and to consider that the total of area of the vent points is less than the points entering purgingmedia.

Ignition Sources

Ignition sources must be removed from the area near the purging operations and it may control the ignition sources that are open flame, electric spark and hot surfaces and welding operations...etc. but the static electricity is an ignition sources that cannot be controlled. So, the pipeline should be earthed.

Sand Blasting

- Cleaning & rearranging site before and duringworking.
- Be sure that the sand blasting equipment is in good conditions and safe for working in hazardoussites.
- Be sure that the hoses, connections, pressure gauges, filters, vent valves and safety valves are safe & in goodcondition.
- The worker on the sand blasting must wear the protective mask and be sure that the air hose is working efficiently along workingperiod.
- Workers must wear appropriate PPE (dust respirator – gloves – safety goggles – safety shoes – overall)
- Making safety meeting before startingwork.
- If the job will done in the confined spaces a work permit must be done including all actions required for thejob.

Storing

- Industrial safety person should ensure the presence & condition of adequate number of fire extinguishingequipment.
- Smoking is completely forbidden in thestores.
- Storing places should be always clean & tidy & free from any litters,papers.
- Do not use benzene in cleaning or in removing grease but use nonvolatile cleaning liquids.
- Flammable materials should be storedseparately.
- Periodically check barrels & packets against any leakage orholes.
- Correct methods of handling, loading & putting materials should be followed & checked bysupervisors.
- On lifting loads manually, take the correct position of legs, chest & back & to bend the knees with the chest upright as much as possible & making the load as close as possible to the body to transfer the load to the muscles of the legs & theknees.
- Be sure the load to be lifted is within the limit that can be lifted or ask for others help or use any mechanical liftingmethod.
- Long loads or pipes should be lifted by two persons on the same shoulder of each person & to be in one direction & with homogeneousfootsteps.
- Use theP.P.E.
- Materials, equipment & spare parts should be stored in an organized & safe way & avoid putting them in high rows or columns to prevent falling down or collapsing.
- Heavy materials & equipment should be stored properly & near to the ground.
- Avoid materials being extended out more than the depth of the storing shelves.
- Use proper ladders to go up to put, load or unload high materials & do not go up over materialrows.
- It is forbidden to pass or stay under the crane or the lifted loads during loading & unloading especially of heavy materials orequipment.
- Switch off electricity after work isfinished.
- Any unsafe work conditions or cases should be declared & told to the responsible authorities &persons.

Storing & Handling of Air & Compressed Gases Cylinders

- Check the cylinders before storage that they are safe & valve & regulator covers are in place & reject any cylinder without any cover. Do a periodic check for the cylinders in thestore.
- Be careful during handling or transporting compressed gas cylinders to prevent them from falling down or from collision with each other or from any mechanicalimpacts.
- Avoid exposing the cylinders to heat or to direct sunlight.
- Compressed gas cylinders should be stored vertically (valves upwards) & to be tied properly in order not tofall.
- Store gas cylinders separately according to type of gas & specially butane, hydrogen &acetylene.
- Do not ever store oxygen cylinders with butane cylinders or any other flammablematerial.
- Empty cylinders should be separated from full ones with a label showing that it is empty but to be treated as the fullones.
- Do not oil or grease valves of compressed oxygen, acetylene or hydrogen cylinders as well as not to touch it with contaminated oily or greasy hands or gloves.
- Always put a label on each cylinder indicating type of gas inside & whether it is inert orflammable.
- Do not use wires or ropes to lift cylinders by cranes but use the suitable & correct lifting method.

Storing Tires& Rubber Materials

- Storage should take place in a closed area for protection against:
    A. Temperature &humidity.
    B. Direct & indirectsunlight.
    C. Ultra violet rays in intensive artificiallight.
    D. Light of mercurylamps.
- Storing place should be well ventilated & avoid high humidity which decreases the condition of the tyre & its efficiency during service.
- Store temperature is preferably to be between 10ºC &20ºC.
- Store should be clean & free from petroleum solvents, grease, oils that decrease the tirecondition.
- Issued tires should be the earliest storedtires.
- Tires to be stored in a way that enables issuing the older stocks before the newerones.
- Storage is preferably to be vertical in woodenballets.
- Avoid horizontal storage; & if happened due to limited space to be with a maximum of 6 tires over each other & to be completely rotated every two months to change its order inStorage.
- In case the cycle of storing & issuing is fast (less than 1 year), no need to take strict or expensive precautions, in many cases it is just the temporary maintenance by spreading talc powder over the tires & the rubbermaterials.

Storing & Handling of Acids

- Acids should be stored in a sealed or shielded store & away from sun heat & from any other flammablematerials.
- Acid name should be written clearly onbarrels.
- Use theP.P.E.

Storing Acid Glass Bottles:

- Always leave an empty space for safety inside every glass bottle (½Gallon)
- Stoppers of the glass bottles should be fitted in a way to allow reliefing the acids' vapors.
- Glass bottles should be stored in a cool & well-ventilatedplace.
- Do not store full glass bottles beside or near any flammablematerials.
- Glass bottles' Stoppers should be made of anti-corrosion & anti flammable material.
- At loading glass, bottles in a hot weather wash them with water & ventilate the stoppers.
- Do not store more than ten glass bottles in one place & to be stored in the form of one or two rows maximum & avoid storing in square shape & leave a passage between rows that allow movingsafely.
- Try to store glass bottles on shelves with openings under which there is a path to discharge any acid leakage from the glassbottles.

Storing Flammable Liquids

Lighting

It is preferable not to use electric connections or preparations inside the stores & to depend for lighting on natural daylight or on electric lamps directed on the stores from outside so that its lights could penetrate through fireproof glass openings, and if necessary, any electric preparations should be of flameproof type.

Ventilation

Preferable to be natural by making suitable openings in the stores covered with metallic wires of narrow lattice.

Flame Causes Prevention

- Do not allow smoking or using uncovered flame or any other thermal sources inside the stores or outside the stores by a minimum distance of 6 meters all around.
- Be careful in moving or handling any metallic items inside the stores & for protection against static charges, packets & tubes should be tied with electric conductors or to beearthed.

Liquid Packets

- Should be protected from any mechanical impacts & to be kept upright in its properposition.
- Do not leave any packets opened & always keep them properly closed.
- Try not to exceed two rows in storing thepackets.

Escaping in Case of Fire

- There should be enough isles between the stored packets & to be always clear, clean & free from any obstacles as well as the emergencyexits.
- Stores should be kept opened as long as there are is personinside.

Recommendations

- Donotallowunspecializedpersonstoenterthestores.
- Marks should be written & put clearly declaring (Danger – Flammable liquids – Forbidden to get close – Nosmoking).

Storing & Handling of Pipes

- Storethepipesproperly&safely&putsuitablebarrierstopreventsliding.
- Keep the correct pyramid shape by keeping the correct number of pipes in eachraw.
- Always inspect the correctness of pipe storage position & rearrange its position ifnecessary.
- Make the manual loading always by two persons on the same shoulder of the two persons and in onedirection.
- Polyethylene pipes should be covered with a non-flammablecover.
- Leave adequate spaces between bundles for the maneuvering of cranes & trailers.

Storing & Handling of Barrels

- Put the barrels properly in a horizontal manner as much aspossible.
- Separate barrels according to its type & put suitable barriers to prevent sliding.
- Check the cleanliness of containers used in discharging oils &grease.
- Do not throw barrels from heights & be careful when sliding a barrel in order not to change itsdirection.
- At lifting barrels, make the knees bended & the back to beupright.
- Be careful that fingers do not get trapped betweenbarrels.
- Use wooden sheets for sliding the barrels from heights & be sure that sheets are in a good condition, properly fixed & its lengthis suitable.
- It is forbidden for persons to get down using thesesheets.

Stop Work Authority

Stop work authority program needs to be developed and conducted by all LDC's to all contractors and subcontractors.

Stop Work Authority (SWA) is a program designed to provide employees and contract workers with the responsibility and obligation to stop work when a perceived unsafe condition or behavior may result in an unwanted event. A key element of a Stop Work Authority Program is a detailed set of written procedures. They will help ensure that every SWA event works consistently and as intended.

A Stop Work Authoring program must clearly define the roles and responsibilities.

The program needs to include the intervention protocol, protocol instructions, reporting methods and follow up.

Stop Work Authority Program

- All employees and its contractor have the authority and obligation to stop any task or operation where concerns or questions regarding the control of HSE risk exist
- No work will resume until all stop work issues and concerns have been adequately addressed
- Any form of retribution or intimidation directed at any individual or company for exercising their authority as outlined in this program will not be tolerated.
- The SWA process involves a stop, notify, correct and resume approach for

the resolution of perceived unsafe work actions or conditions.

- **All employee doesn't have to be experts on the job on hand but if you identify at risk task or behavior you have Obligation to stop work!**
- **Company employees and contractors** are responsible to initiate a "stop work" intervention when warranted, support the intervention of others and properly report all "stop work" actions.
- **Supervisors** are responsible to create a culture where SWA is exercised freely, honor request for 'stop work', work to resolve issues before operations resume, recognized proactive participation and ensure that all "stop work" actions are properly reported with required follow-up completed.
- **Management** must establish the clear expectation to exercise SWA, create a culture where SWA is exercised freely, resolve SWA conflicts when they arise and hold those accountable that chose not to comply with established SWA policies.
- **HSE** in support of operations is responsible for monitoring compliance with the requirements of this program, maintenance of associated documents, processes and training materials, identification of trends, and sharing of lessons-learned.

Stop Work Authority Program – Step 1 to 5

- Framework for all Stop Work Interventions

Step	Protocol Instruction
1	When a person identifies a perceived unsafe condition, act, error, omission, or lack of understanding that could result in an undesirable event, a "stop work intervention shall be immediately initiated with the person(s) potentially at risk.
2	If the supervisor is readily available and the affected person(s) are not in immediate risk, the "stop work action" should be coordinated through the supervisor. If the supervisor is not readily available or the affected person(s) are in immediate risk, the "stop work" intervention should be initiated directly with those at risk.
3	"Stop work" interventions should be initiated in a positive manner by briefly introducing yourself and starting a conversation with the phrase "I am using my stop work authority because…." Using this phrase will clarify the intent and set expectations as detailed in this procedure.
4	Notify all affected personnel and supervision of the stop work issue. If necessary, stop associated work activities, remove person(s) from the area, stabilize the situation and make the area as safe as possible.
5	All parties shall discuss and gain agreement on the stop work issue.

6	If determined and agreed that the task or operation is OK to proceed as is (i.e., the stop work initiator was unaware of certain facts or procedures) the affected persons should thank the initiator for their concern and proceed with the work.
7	If determined and agreed that the stop work issue is valid, then every attempt should be made to resolve the issue to all affected person's satisfaction prior to the commencement of work.
8	If the stop work issue cannot be resolved immediately, work shall be suspended until proper resolution is achieved. When opinions differ regarding the validity of the stop work issue or adequacy of the resolution actions, the location's "person in charge" shall make the final determination. Details regarding differences of opinion and resolution actions should be included in the documented report.
9	Positive feedback should be given to all affected employees regarding resolution of the stop work issue. Under no circumstances should retribution be directed at any person(s) who exercise in good faith their stop work authority as detailed in this program.
10	All stop work interventions and associated detail shall be documented and reported as detailed in this program.

Using of Hand Tools

- Inspect all the tools periodically & keep them always clean & in good condition.
- Unsafe tools should beexcluded.
- Handy tools should not be thrown from one person to theother.
- Handy tools should be kept away from oils & grease to avoid slipping in workers'hands.
- After cleaning the tools by the cleaning liquid, the worker has to wash his hands with water &soap.
- Do not carry tools or put in clothes' pockets during moving upwards or downwards on aladder.
- Avoid working (except if must) in areas in which handy tools are used in higher planes over the workers' heads (use safetyhelmet).
- Tools with wooden hands should be rounded & free from breaks & scratches to be holed safely.
- Workers should use theP.P.E.

Using of Ladders

- Check the rubber fixtures and payattention.
- Ladder stairs should be free from grease oroil.
- Continuous inspection of the ladders to ensure absence of anydefects.
- Inspecting the ladder in case of falling down to be sure there are no defects in the standingbars.
- Ladders on vehicles should be fixed in a way to minimize impacts & friction duringtransportation.
- Ladders should be stored in a well-ventilated place &away from any radioactive source or any high temperature source like ovens or steam pipes or boilers.
- In case of horizontal storage of ladders put suitable supports to prevent collapsing orfalling.
- Well fixation of the ladder to prevent anyslipping.
- Avoid leaving ladders in front of doors orwindows.
- Use suitable barriers around ladder in case of using it in isles or vehicles ways.
- Do not put ladders over any unstable bases to obtain extra height.
- Do not ever assemble short ladders to obtain a longone.
- Carefully move ladders in places with electriccircuits.
- Always look in front of you during moving up or down on ladders (face faces theladder).
- Hands should be free during moving up or down on ladders and in case of using any tools or equipment use ropes to get it up ordown.
- Shoes should be free from any grease or oil or any slipping substances during usingladders.
- Avoid using the upper stairs of the ladder as an ordinarystair.
- Carefully adjust & lock the extended ladders before usage and do not try to adjust it during work and try to make the distance between the ladder &its mounting wall ¼ the required height from theladder.
- Use the ladder stairs for its purposes & not assupports.
- In case of using the long ladder, somebody should be standing at the bottom of the ladder while the technician is working at thetop.

Using Gamma(γ)Ray in Welding Inspection

- Be sure of the insulation of theγ Ray device & that it Is completely safe.
- Be sure entering the radioactive source inside the insulated device (at the beginning of the cable) after finishing shooting.
- Be sure of applying the human safety circle around the shootingplace.
- Specialists with good experience & official certificates are the only persons to do thisjob.

Working on Scaffolds

- **Design of theScaffold**
    - Scaffold installations should be according to manufacture requirements and OSHA CFR 29 Part 1926-Subpart L-scaffolds.
    - Platform to be fully blanked metal sheets.
    - Platform surrounded by middle and top and top guardrails.
- EGAS hold a work-shop with all LDCs on deliver scaffolds safety specifications
- Assign supervisor for each WHA activity that is competent to monitor the activity, and with the minimum qualification mentioned in section 1 (Contractor management competencies, roles and responsibilities)
- Well supervision should be done on the scaffold &report any defect immediately.
- Daily supervision in case of working on the scaffold for more than one day.
- Site inspection checklist to be completed by competent supervisor with the minimum qualification mentioned in section 1. (Contractor management competencies, roles and responsibilities)
- Use safety belt during working onscaffolds.
- Do not put any equipment, instruments or anything not in need on scaffold.
- Use scaffold stairs to move up & down and not thecrossbars.
- Do not look down during going up ordown.
- Use correct, suitable tools and to be in goodcondition.
- Do not make extensions to increase Stillsonlengths.
- Check for safe electrical connections for the used tools anddevices.
- Do not remove chip during working with screwingmachines.
- Remove chip using suitable brushes &not byhands.
- Always keep working place neat & tidy afterwork.
- Work should be immediately stopped in case of heavy wind or rain or any emergency case at the worksite.
- Wear appropriate P.P.E to protect you from injury (helmet – gloves – safety shoes – safetybelt).
- Check the suitability of the ground in the place for the scaffolds to be installed.

- Install scaffolds 30 cm away from the pipelocation.
- Check all parts of the scaffold &remove any defectedparts.
- Be sure of installing all cross bars, standing bars and that all the safety locking benz are in good condition.
- Make the scaffold away fromelectric cables & ducts by an adequate distance.
- Combine the scaffolds with the building every 3 floors byusing clamps.
- Be sure of fitting the stairs & standing bars with a minimum of 2 on each floor.
- Put one safety floor on the last workingfloor.
- Do not ever throw any of the scaffolds components during installing or reinstalling.
- Work should be immediately stopped in case of heavy wind or rain or any emergency case at the worksite.
- Do not move scaffold from any place to another except after reinstalling& installing at the newplace.
- All components of the scaffold should be well-locked & secured during transportation on vehicles & without any exceeding edges on the vehicle.
- Workshouldbedoneunderthesupervisionofthequalifiedsupervisoror anyone qualified replacinghim.
- All workers should use P.P.E (helmet–safety belt–safety shoes–gloves–overall suit).
- Safety obligatory signs to wear safety harness should be posted clearly at site where scaffolds are being used.

Bracket Installations

- Check the suitability of the ground inside the customer'sapartment.
- Check all parts of the bracket & remove any defectedparts.
- Check installing 2 clamps and 2 standingbars.

Working on Roads / Open Areas

- Put warning signs and signals along sides of the excavation for protection of workers, people, and vehicles.
- Put all traffic signs required for thejob.
- In case of night working, you must put all warning flashers & phosphorescence signs.
- You must put all required bridges for vehicles in case of excavation is crossed with the road.
- Put the needed human brides specially beside schools andhospitals
- Put all the required barriers and signs around the excavation if it is in open area.

All warning signs and signals must put in places that are clear for the public and traffic.

Welding

- Avoid welding or flame cutting in any area, rooms or stores containing any flammablematerials.
- Distance between cylinders of gases used for welding or flame-cutting places should be 5 meters ormore.
- Chains or belts to prevent falling down should fix verticalcylinders.
- The specialized persons of the company should do repairing of regulators defects & cylinder valvesonly.
- Used hoses should be at least 5 meters long & should be installed by clipses so that it would be fixed properly.
- Hoses should be stored properly to avoid knotting or ignition from near heat sources.
- Proper ones should change defected hosesimmediately.
- Check the correct working pressure of the flamehose.
- Welder should not lift hoses on his shoulder during welding so that his clothes do not absorb oxygen or any gases from leakage locations & catch fire.
- Welder should not keep matches in hispockets.
- Leave adequate distance (not less than 15 meters) around welding location free from any papers, clothes, litters or any empty or full gas cylinders.
- Welder should use welding mask with special glasses to protect his eyes from ultra violetrays.
- It is forbidden for any vehicles or cranes or any heavy equipment to pass over gas hoses or electriccables.
- Avoid welding or cutting in barrels, tanks or gas cylinders with unknown contents.
- On welding or cutting pipes or tanks containing any flammable contents, it should be emptied from these contents & consulting the concerned persons before starting welding orcutting.
- On welding or cutting in boiler areas, gas shut down should be done &check absence of leakage before startingwork.

On working in closed workshops on a table or a vice, do not flame hose beside the work piece to avoid catchingfire.

- Welder clothes & gloves should be completely free from any grease, oils, benzene or kerosene or any flammable materials orfluids.
- Inform the safety persons & check work place if it is outside the workshop, in this case a work permit could be donealso.

Electric Arc Welding

- Perform steps 1, 12, 13, 14 &19
- Check the electric cable from any cuts or uninsulated parts, also check the plug.
- Welding hose should be insulated properly, and during stop or rest periods it should be left on an insulated holder so that it will not touch the work piece.
- Stop welding during raining.
- If working at high places & at stop or rest periods, welding hose should not be thrown down except after switching offelectricity.

Periodically, pass by welding or cutting location after workfinishes.

Work Permit

What is work permits?

- Work permit is not just a permit to do dangerous works; its essential part of the system, which identify how can the job, is done safely.
- Work permit is a document, which gives the right for worker to do his job, taking into account all risks, precautions, equipment that are exist, and how to do his job safely.
- The getting of work permit does not also mean the process is safe, it must mention that well trained personnel are controlling all hazards by means of control measures andprecautions.
- The work permit is based on written procedure used to control special types of works that have potential hazards and it is a communication method between sites, workers, supervisors, and management.

Instructions for the permit issuance:

General:

a- Specify the responsibilities of supervision personnel for every process and precautions to take intoaccount.

b- There must be a clear instructions and training for using and issuance of workpermits.

c- The system of work permit must be followedup.

* The following points have to be clear stated inpermits:

1- Specify the department or sector responsible for the job, type of job, and location of thejob.

2- Specify type and nature of job to all related personnel with clarification of all relatedhazards.

3- Illustration of all control measures required to protect from possible hazards andrisks.

4- Be sure that worker is qualified for the job also be sure that a continuous supervision is applied and qualified person reviews allprecautions.

5- Illustration of various work procedures on site and temporary work stopping procedures.

6- Illustration of the followed procedures for elongation of working period's more than one shift also be sure that all procedures that guarantee that the job is safe are fullyillustrated.

Permit preparation

1- it's very important that all activities related to the job to be taken into account to avoid any risks obtained from the job , that is done by one who is responsible for the job (site manager) who monitor the issuance of permits till job is finished.

In addition, it is important in some cases to participate more than one in the responsibility, each in his field and site manager has the all authority for supervision for all responsible personnel.

2- The permit requires a good planning from all related personnel, where they must be informed about the work places that may be affected by the work and taking all precautions to avoid any effect could be happened to any of work activities. Also giving the time required to identify all risks, control measures, and preparation of site for work, the supposed technical method to achieve that is the procedure of: "Job Hazard Analysis".

3- The most important stage of permit issuance is the risk assessment which done by permit maker with work supervisor also may be other specialists participate in the risk assessment , the following have to be done at the assessment:

a- Get the detailed information about the process to be done from supervisor with taking into account all alternatives that can achieve the work safely, like timing, method of work…Etc.

b- Taking into account all risks that may arise from handling materials and working byequipment.

c- Evaluation of difficulties and expected effects on working environment also expected hazards that affect thework.

* Types ofWorks

Types of works include works such as maintenance, repairing, inspection, testing, construction, re-construction, machines disassembly, modification and cleaning.

* ActivitiesInterference

The main aim is to verify that no hazardous interference between activities that may contain risks for people or equipment.

* PermitValidity

It is important to specify the validity of work permit to the work permit system under control also it's favorable to eliminate permit at the end of the working shift and issue a new one if the job is continued for more than one shift .

* Isolation

It is an essential part of safely working system; also, each company makes its own isolationprocedures based on working activities and associated risks.

* Precautions

You must know the nature, type of job for defining the required precautions that will be wrote and reviewed in its form, and each supervisor must be sure that all precautions are implemented.

* GasTest

A test for gas leakage must be done on sites, which contain flammable or toxic gases or expected decreasing / increasing of oxygen.
The results of the test must be recorded in the permit.

* Safety obligatory signs

Safety obligatory signs to be added to the PTW.

* Approval(signature)

The number of work permit approval personnel are specified according to nature and type of work and permit, as a minimum requirement the permit issuance person and the work supervisor must sign on the permit and any other person who participated in the permit issuance and if the responsibility is changed to other personnel, he must sign on thepermit.

* **Process**

- permit sing

The permit must be communicated to all related parties or personnel and copies of permit must sent to these related parties.

- Permit validity

The permit issue personnel must re-evaluate the conditions of work that he issued for the permit at the first time and be sure that conditions are not changed – (it is common that this evaluation is done at the end of each work shift).

- Changing Shifts

The points of changing shifts are considered very critical for work permit and any fault of information transfer is a reason for many accidents. In addition, information transfer methods are:

a- Work permit logbook.
b- Files of permits.
c- Signs and information boards.
d- Computer screen.

- EmergencyProcedures

The permit must contain the followed procedures in case of emergencies like limitations of some activities …etc. and re-evaluate the job, whichthe permit isissued for, to ensure that conditions are not changed by existing emergency.

- Permit Monitoring

The monitoring must not be stopped to ensure not all the conditions are changed along with the process progress.

- Finishing job inpermit

When the job is finished, the permit copies are collected and sent back to the issuance parties, which will sign on the permit with the supervisor stating that the job is finished; also other related parties are informed.

- Site Inspection

Site inspection checklist to be completed prior to start the job by competent supervisor with the minimum qualification mentioned in section 1. (Contractor management competencies, roles and responsibilities)

The permit party's representative must make a site inspection after the job to ensure that it is leaved in good conditions.

- Coming back to operationmode

There must be some procedures for equipment to come back to operating mode like:

a- The work on machines isfinished.
b- Thefacilitiesandequipmentareleavedinsafeandgoodconditions. c- All isolation and outreaches procedures are terminated.
d- The responsible personnel must accept officially the existing conditions of the facility and equipment.

- Records

The permits must recorded in a specified logbook.

Working in Confined Spaces

Description of confined spaces, which need to work permit

1-Manholes 2- Petroleumtanks

3-Tunnels 4- Ground tanks

5-Pipelines 6- Digging for depth more than 2m…..etc.

Confined space entry

Entry into any confined space cannot proceed unless:

- All other options have been ruledout.
- A responsible person issues permit withauthorization.
- Permit is communicated to all affected personnel and posted asrequired.
- All persons involved are competent to do the work.
- All sources of energy affecting the space have beenisolated.
- Testing of atmosphere is conducted, verified and repeated as often as defined by the riskassessment.
- Stand-by person isstationed.
- Unauthorized entry isprevented.

Safe system of work (SSOW) requirements to be listed and confirmed with contractors/subcontractor's workers.

Job hazard analysis (JHA)

What is a job hazard analysis?

A job hazard analysis is a technique that focuses on job tasks as a way to identify hazards before they occur. It focuses on the relationship between the worker, the task, the tools, and the work environment. Ideally, after identifying uncontrolled hazards, steps will take to eliminate or reduce them to an acceptable risk level.

Why is job hazard analysis important?

Many workers are injured and killed at the workplace every day. Safety and health can add value to our business, job, and your life.

We can help prevent workplace injuries and illnesses by looking at workplace operations, establishing proper job procedures, and ensuring that all employees are trained properly.

One of the best ways to determine and establish proper work procedures is to

conduct a job hazard analysis. A job hazard analysis is one component of the larger commitment of a safety and health management system.

What is the value of a job hazard analysis?

Supervisors can use the findings of a job hazard analysis to eliminate and prevent hazards in their workplaces.

This is likely to result in fewer worker injuries and illnesses; safer, more effective work methods; reduced workers' compensation costs; and increased worker productivity.

The analysis also can be a valuable tool for training new employees in the steps required to perform their jobs safely.

For a job hazard analysis to be effective, management must demonstrate its commitment to safety and health and follow through to correct any uncontrolled hazards identified. Otherwise, management will lose credibility and employees may hesitate to go to management when dangerous conditions threaten them.

What jobs are appropriate for a job hazard analysis?

Priority should go to the following types of jobs:

• Jobs with the highest injury or illness rates;

• Jobs with the potential to cause severe or disabling injuries or illness, even if there is no history of previous accidents;

• Jobs in which one simple human error could lead to a severe accident or injury;

• Jobs that are new to your operation or have undergone changes in processes and procedures; and

• Jobs complex enough to require written instructions.

Steps of Job Hazard Analysis:

Site Supervisors with coordination with HSE department needs to:

- Break the job task into steps.
- Identify the hazards of each step
- During T.B.T, Review the list of hazards with employees who do the job. Discuss what could eliminate or reduce them.
- Identify ways to eliminate or reduce the hazards.

Job hazard analysis (JHA) should be attached/ referenced to the permit to work

Tool Box Talk:

On job training to be conducted by the contractor onsite include the details discussed in the JHA and to be signed by all attendees who participate in the job and his role (Trained workers ONLY should be involved).

JHA outcomes are used in the TBT (who to do what, when and how to do it). Linked to the PTW with the JHA as the main function of the Tool Box Talk is to discuss the outcomes of the JHA with the workers prior to start the job onsite.

Work shops

- Smoking is completelyforbidden.
- Isles should be clean & free from any obstacles & oils should be removed daily.
- Litters should be put in special baskets or containers & to get rid of it continuously & as quick aspossible.
- It is forbidden for anyone to work on machines except the specifiedworkers.
- Do not clean or wash equipment or machines with benzene or any other quick flammable material, but if necessary use kerosene or solar and avoid clothes being wet by benzene orsolar.
- It is forbidden to store quick flammable materials in opened containers or in any other places not specified for thispurpose.
- Switch off electricity after work finishes & check the safety of wires & connections.
- Use the suitable PPE for every job to protect theworker.
- Check the safety & condition of the handy tools & equipment used inrepairs.
- Avoid oil spilling on the ground during changing oils for vehicles &machines.
- Expired oils should be collected inbarrels.
- Expired filters should be collected in barrels with specialcolor.
- Switch off electricity & do the daily cleaning after worktime.

Washing by Solvents

- The workers handling diesel or hydrocarbon solvents must read the using instructions on cans beforeuse.
- Washing by diesel must be done in its specified place and the washing residuals are collected into separated barrels.
- Do not spill diesel or hydrocarbon solvents intosewages.
- Use the proper PPE (rubber gloves – safety goggles – safety shoes…etc).
- Do not use diesel in compressed form for spraying to avoid fire and inhalation risks.
- Wash by diesel in a well-ventilatedarea.
- Smoking or other hot works are forbidden in washing by dieselarea.
- The residual barrels are moved to collecting place for disposal and be sure the barrels are closedtightly.
- Labels must be put on the solvents residualbarrels.
- Keep the washing area and collecting barrels area clean to avoid slipping and environmental contamination.

Waste Management

1-Purpose

Making a system to collect, classify and dispose of wastes.

2-Range

All wastes that produced by working in all activities of the company.

3-Responsibility

Responsibility of every working site manager.

4-Forms

Security person at the exit area and storing places of the company records waste trucks.

5-Definitions

5.1- Dangerous wastes

It is all types of wastes that effect on working site and Surrounding environment safety (used oils – residual paints – residual thinner – odorant drums – residual kerosene – batteries – printing inks empty cans ,…etc.)

5.2- Liquid wastes

It is including the cooling liquids of screwing & lathing Machines

5.3- Solid wastes

It is including (scrap – wood – paper – residual steel residual pipes – used tires – residual digging & civil works – organic substances ,…….etc)

6- Steps

a- Dangerous wastes

It has collected in convenient containers & prepared by convenient method.

The responsible person collects the dangerous waste containers to a specified place until its disposal.

Dangerous wastes are disposed according to thefollowing:

- Used oils are sent to company storing place and disposed by selling.
- Batteriesaresenttocompanystoringplaceanddisposedbyselling.
- A waste contractor disposes empty cans of (paints–thinner–kerosene.
- Residual kerosene is reused in pipes washingworks.
- Cans of printing inks are disposed by sending it back to the supplier.

b- Liquid wastes

- Collected in convenient containers and marked then sent to company storing place prepared to be disposed by selling.

c- Solidwastes

- The wastes of (residual pipes – scrap – wood – tires – empty drums – residual steel) are sent to company storing place and disposed by selling.
- The wastes of human activities, administrative buildings and activities are collected by a contractor and disposed bygovernment.

Gas odorant empty drums are chemically treated and collected in company storing place, prepared to disposeit.

Manual update

This manual will be updated on annual basis and/or in case of major accident and/or when necessary.

Attachment -1: LDC Risk Assessment

تحليل مخاطر العمل

Risk Assessment

تاريخ الإصدار	مسئول السلامة بالموقع	مدير المنطقة	مدير السلامة والصحة المهنية والبيئة
٢٠١٨/١/١			
٢٠١٩/١/١			
٢٠٢٠/١/١			
٢٠٢١/١/١			

طريقة تقييم المخاطر :

يتم استنتاج درجة الخطورة بناءا على مقاييس كل من احتمالية وقوع الخطر و شدة تأثيره ، ومن ثم ينتج لنا درجة الخطورة التي تعبر عن أهمية هذا الخطر وتأثيره بدون وجود وسائل تحكم .

لذلك يتم تقييم المخاطر لنشاطات الشركة طبقا للآتي :

الدرجة الكلية = أ × ب حيث أن : أ : درجة احتمال حدوث الخطرب : درجة شدة التأثير

الأولوية P1= اهمية عاليه P2= اهمية متوسطة P3= اهمية ضعيفة

و يمكن تلخيص ما سبق طبقا للجدول الآتي :

خطوات / عمليات المشروع:

Result		Severity الشدة			Likelihood الاحتمالية
Evaluation	Range	3	2	1	
لا يلزم أخذ احتياطات اضافية	2-1	3	2	1	1
مطلوباتخاذ اجراءات لتقليل مستوى الخطر (برنامج عمل)	4-3	6	4	2	2
ايقاف العمل حتى أخذ الإحتياطات لتفليل مستوى الخطر	9-6	9	6	3	3

Likelihood الاحتمالية		Value
احتمال ضعيف (نادر)	1	1
أحتمال متوسط	2	2
احتمال عالى (أكيد)	3	3

Severity الشدة		Value
ضرر طفيف	1	1
ضرر متوسط غير مميت	2	2
ضرر شديد (مميت)	3	3

أعمال الرفع المساحي و حصر بيانات العملاء و الاجهزة—(رسم ومساحة)

أعمال استلام الاعمال بالموقع —(الجودة)

اعمال التشوين و التخزين و التداول المواد —(المخازن)

اعمال شبكات – اعمال تركيبات — (المشروعات)

الأعمال الإدارية (المباني الادارية) — عام

العملية : نقل عدوى (كورونا)

تحليل مدخلات ومخرجات العمليات

Input / Output Data Screening Sheet

الموقع : مشروع (رسم ومساحة)

العملية : أعمال الرفع المساحي و حصر بيانات العملاء و الاجهزة

المدخلات Inputs (Manpower, Material &Equipment)	المخرجات Outputs
أجهزة المساحية	نقاط مرجعية محددة ومميزة
مهندس مساحة + عمال	تقرير مكتوب
سيارة	رسومات هندسية وبيانات
سبراي + أدوات يدوية بسيطة (شاكوش – مسمار – خيط)	
رسومات هندسية	

جدول تسجيل وتقييم مخاطر السلامة والصحة المهنية

م No	النشاط Activity	الخطر Hazard	الاثار المترتبة Consequences	تحليل الخطر Risk Analysis			اجراءات التحكم المطلوب تنفيذها Required Control Measures	Risk Analysis (Existing Ctrl) تحليل الخطر بعد التحكم			اجراءات التحكم اضافية Aditional Control Measures	الأولوية Priority
				S الشد	P الاحتمال	R الخطر		S الشد	P الاحتمال	R الخطر		
١	**الحركة والانتقال بالسيارات**	**النقل**	أصابة**العاملين** بسبب حوادث الطرق	3	2	6	- يتم استخدام سائقين مؤهلين -إتباع تعليمات القيادة الآمنة - متابعة السيارات عن طريق ال GPS	2	1	2	- تدريب السائقين على القيادة الدفاعية - الكشف الدورى على السائقين و تحليل مفاجىء للمواد المخدرة لهم	P2
٢	**العمل بالعراء (موقع شبكات)**	**سقوط**	سقوط**العاملين** و **الماره** باحد مواقع الحفر او الاصطدام باحدى السيارات بالطريق مسببا اصابات للعاملين	3	2	6	-تحديد مواقع العمل بحواجز - توفير لافتات ارشادية و شريط تحذير - وضع مشايات على الحفر لمساعدة المارة فى التنقل - ارتداء مهمات الوقاية اللازمه لهذا العمل - توفير شنطة اسعافات اولية بالموقع	3	1	3	- اصدار تعليمات العمل في الطرق أو العراء (SG_F- (11)) - ارتداء العاملين لسترات بها عواكس ضوئية	P1
٣		**اجهاد حراري**	تعرض**العاملين** لحالات الاغماء نتيجة ضربات الشمس و ارتفاع درجه الحرارة	2	2	4	- تقليل عدد ساعات العمل فى وقت الظهيرة - توفير زجاجات مياه للعمال - ارتداء مهمات الوقاية المناسبه - توفير شنطة اسعافات اولية بالموقع - قياس الوطأة الحرارية	2	1	2	- اصدار تعليمات العمل في الطرق أو العراء (SG_F- (11))	P3

٤	**استخدام الاسبراى**	**مادة خطر**	اصابه **العاملين** بتهيج العين او الجلد عن اللمس و الاختناق عند التعرض للرائحه لفترة طويلة و التسمم عن طريق البلع	3	2	6	- تقليل فترة التعرض - تعريف العاملين ال MSDS - عدم التعرض بطريقة مباشرة لهذه الماده - ارتداء مهمات الوقاية اللازمة - توفير شنطة اسعافات اولية بالموقع	3	1	3	- اصدار تعليماتالتعامل مع المواد الكيميائية (SG_F- (29))	P3
٥		**حريق**	عند وجود اي مصدر للهب او شرز بالقرب من الاسبراي قد يؤدي الي التسبب بحريق **بالمعدات** و **الخامات**	3	2	6	- منع التدخين او اي مصدر اشتعال - توفير ال MSDS علي المواد الكميائية - توفير استعدادات الحريق من طفايات و بطاطين للحريق	3	1	3	- اصدار تعليمات العمل في الطرق أو العراء (SG_F- (11))	P1
٦	**استخدام العدد اليدوية**	**بيئة العمل**	تناثر العدد و الخامات علي ارضية منطقة العمل مما قد يسبب السقوط **العاملين** و اصابة **العاملين** بسبب عدم صلاحية المعدات المستخدمة	2	2	4	- الفحص الدائم للعدد المستخدمه - استبعاد كل العدد الغير صالحه للاستخدام - الإهتمام بالترتيب والنظافة - التدريب علي استخدام العدد اليدوية	2	1	2	- اصدار تعليمات النظافة والترتيب (SG_F- (42)) - اصدار تعليمات استخدام العدد اليدوية (SG_F- (2))	P3
٧	**خدمة العملاء**	**التعامل مع الجمهور**	نقل عدوى او امراض معدية من قبل العملاء **للعاملين** و تعرض **العاملين** للتعنيف من قبل العميل للعامل	2	2	4	- تدريب العاملين على كيفيه التعامل مع العملاء - عدم التعامل على مسافه قريبه من العميل - الاهتمام بالاجراءات الاحترازيه للحماية من الامراض	2	1	2	- التدريب علي مهارات و سلوكيات التعامل مع الجمهور	P3
٨	**استخدام اجهزة المسح**	**تلف**	الاستخدام الخاطئ يعرض **الأجهزة** المستخدمة للتلف	2	2	4	- الصيانة الدورية للاجهزة و معايرتها - استخدام حقائب خاصة للأجهزة للحفاظ علي الأجهزة من التلف	2	1	2	- اصدار تعليمات العمل في الطرق أو العراء (SG_F- (11))	P3

تحليل مدخلات ومخرجات العمليات

Input / Output Data Screening Sheet

الموقع : مشروع (الجودة)

العملية : اعمال استلام الاعمال بالموقع

المدخلات Inputs (Manpower, Material &Equipment)	المخرجات Outputs
مهندس جودة + عمال + مشرفين	تقرير مكتوب
سيارة	
أدوات يدوية بسيطة	
رسومات هندسية	

جدول تسجيل وتقييم مخاطر السلامة والصحة المهنية

م No	النشاط Activity	الخطر Hazard	الاثار المترتبة Consequences	تحليل الخطر Risk Analysis			اجراءات التحكم المطلوب تنفيذها Required Control Measures	Risk Analysis (Existing Ctrl) تحليل الخطر بعد التحكم			اجراءات التحكم اضافية Aditional Control Measures	الأولوية priority
				S الشد	P الاحتمال	R الخطر		S الشد	P الاحتمال	R الخطر		
١	**الحركة والانتقال بالسيارات**	**النقل**	أصابة**العاملين** بسبب حوادث الطرق	3	2	6	- يتم استخدام سائقين مؤهلين -إتباع تعليمات القيادة الآمنة - متابعة السيارات عن طريق ال GPS	2	1	2	- تدريب السائقين على القيادة الدفاعية - الكشف الدورى على السائقين و تحليل مفاجىء للمواد المخدرة لهم	P2
٢	**العمل بالعراء (موقع شبكات)**	**سقوط**	سقوط**العاملين** و **الماره** باحد مواقع الحفر او الاصطدام باحدى السيارات بالطريق مسببا اصابات للعاملين	3	2	6	-تحديد مواقع العمل بحواجز - توفير لافتات ارشادية و شريط تحذير - وضع مشايات على الحفر لمساعدة المارة فى التنقل - ارتداء مهمات الوقاية اللازمه لهذا العمل - توفير شنطة اسعافات اولية بالموقع	3	1	3	- اصدار تعليمات العمل في الطرق أو العراء (SG_F- (11)) - ارتداء العاملين لسترات بها عواكس ضوئية	P1
٣		**اجهاد حراري**	تعرض **العاملين** لحالات الاغماء نتيجة ضربات الشمس و ارتفاع درجه الحرارة	2	2	4	- تقليل عدد ساعات العمل فى وقت الظهيرة - توفير زجاجات مياه للعمال - ارتداء مهمات الوقاية المناسبه - توفير شنطة اسعافات اولية بالموقع - قياس الوطأة الحرارية	2	1	2	- اصدار تعليمات العمل في الطرق أو العراء (SG_F- (11))	P3

٤	**استخدام العدد اليدوية**	**بيئة العمل**	تناثر العدد و الخامات علي ارضية منطقة العمل مما قد يسبب السقوط **العاملين** و اصابة **العاملين** بسبب عدم صالحية المعدات المستخدمة	2	2	4	- الفحص الدائم للعدد المستخدمه - ابعاد كل العدد الغير صالحه للاستخدام - الإهتمام بالترتيب والنظافة - استخدام مهمات الوقاية المناسبة للنشاط - التدريب علي استخدام العدد اليدوية	2	1	2	- اصدار تعليمات النظافة والترتيب (SG_F- (42)) - اصدار تعليمات استخدام العدد اليدوية (SG_F- (2))	P3
٥		**مادة خطرة**	اصابة **الفنيين** بالتسمم عند كسر البارومتر الزئبقى	2	2	4	- عدم التعامل المباشر لمادة الزئبق عند كسر البارومتر الزئبقى - تدريب العاملين علي التعامل مع مادة الزئبق - استخدام مهمات الوقاية المناسبة للنشاط - توفير شنطة اسعافات اولية بالموقع	2	1	2	- اصدار تعليماتالتعامل مع المواد الكيميائية (SG_F- (29))	P3
٦	**خدمة العملاء**	**التعامل مع الجمهور**	نقل عدوى او امراض معدية من قبل العملاء **للعاملين** و تعرض **العاملين** للتعنيف من قبل العميل للعامل	2	2	4	- تدريب العاملين على كيفيه التعامل مع العملاء - عدم التعامل على مسافه قريبه من العميل - الاهتمام بالاجراءات الاحترازيه للحماية من الامراض .	2	1	2	- التدريب علي مهارات و سلوكيات التعامل مع الجمهور	P3
٧	**العمل علي ارتفاع**	**سقوط**	استخدام ادوات الحادة من علي ارتفاع (سقالة) مما ينتج إصابة وجروح**للعاملين**	3	2	6	- حمل العدة بحقائب مناسبة و منع التشوين علي السقالة - عمل حواجز بشرائط حول السقالات - فحص السقالة عن طريق نموذج الفحص الخاص بها - تصريح السقالة موجود و مكتمل	2	1	2	- ترك مسافة وقائية بين السقالة و خطوط نقل الكهرباء	P1

					البيانات - يتم استخدام مهمات الوقاية الشخصية للعاملين من الخوذ والأحذية و احزمة الأمان							
٨		**سقوط**	سقوط **العمال** من ارتفاع (سقالة) مما ينتج إصابة العمال او الوفاه	3	2	6	- يتم استخدام احزمة امان و فحصها - الكشف الطبي على العاملين علي السقالات للتاكد من اللياقة الطبية - يتم استخدام مهمات الوقاية الشخصية للعاملين من الخوذ والأحذية و احزمة الأمان	2	1	2	- ترك مسافة وقائية بين السقالة و خطوط نقل الكهرباء	P1
٩		**سقوط**	انهيار **السقالة**مما ينتج إصابة **العمال** او الوفاه	3	2	6	- تركيب السقالة عن طريق مختص - الربط الايجابي ٥٠% فاكثر - عمل حواجز بشرائط حول السقالات - فحص السقالة عن طريق نموذج الفحص الخاص بها - تصريح السقالة موجود و مكتمل البيانات - يتم استخدام مهمات الوقاية الشخصية للعاملين من الخوذ والأحذية و احزمة الأمان	2	1	2	- ترك مسافة وقائية بين السقالة و خطوط نقل الكهرباء	P1

تحليل مدخلات ومخرجات العمليات

Input / Output Data Screening Sheet

الموقع : مشروع (المخازن)

العملية : اعمال التشوين و التخزين و التداول المواد

المدخلات Inputs (Manpower, Material &Equipment)	المخرجات Outputs
مشرف + سائق ونش + سائق سيارة شحن + عمال	تخزين ومناولة المواد
ونش + سيارة / تريلات شحن + سيارات للتنقل	نقل المواسير إلى موقع الحفر
مواسير + أدوات واحبال الرفع والمناولة	غازات عوادم المعدات
	ضوضاء

جدول تسجيل وتقييم مخاطر السلامة والصحة المهنية

م No	النشاط Activity	الخطر Hazard	الاثار المترتبة Consequences	تحليل الخطر Risk Analysis			اجراءات التحكم المطلوب تنفيذها Required Control Measures	Risk Analysis (Existing Ctrl) تحليل الخطر بعد التحكم			اجراءات التحكم اضافية Aditional Control Measures	الأولوية priority
				S الشد	P الاحتمال	R الخطر		S الشد	P الاحتمال	R الخطر		
١	اعمال تشوين وتخزين المواد	**المناولة اليدوية**	نقل المواسير و الخامات الثقيلة بطريقة خاطئة قد تؤدي لاصابات خطيرة **للعاملين** ناتجة عن الاطراف الحادة او السقوط	2	3	6	- عمل خطة رفع جماعي - استخدام مهمات الوقاية المناسبة للنشاط - مراجعة شهادات الرفع للاوناش - تدريب العاملين علي المناولة اليدوية للخامات	2	1	2	- اصدار تعليمات أعمال الرفع والتحميل (SG_F- (39)) - اصدار تعليماتالتخـزين (SG_F- (33)) - اصدار إجراءات السلامة بالمخازن	P2
٢		**حريق**	حرائق**الخامات** بسبب التخزين غير الجيدلمنتجات قابلة للاشتعال او مساعدة علي الاشتعال مع وجود اي مصدر للهب او شرز بالقرب منها قد يؤدي الي التسبب بحريق	3	2	6	- توفير طفايات مناسبة - الإهتمام بالترتيب والنظافة والتثبيت الجيد للمواد المخزنة و فصلها - منع استخدام اجهزة الاتصال او اي مصدر اشتعال - توفير استعدادات الحريق من طفايات و بطاطين للحريق - الفصل بين الخامات القابلة للاشتعال - توفير صندوق اسعافات اولية - استخدام مهمات الوقاية المناسبة للنشاط	3	1	3	- اصدار إجراءات السلامة بالمخازن - إدراج الحريق في خطة الطوارئ - توفير انظمة اطفاء و انذار	P1

٣	**عمليات المناولة والشحن من المستودع والتنزيل بالموقع**	**رفع و تحميل باستخدام معدات ميكانيكية**	تحميل وتنزيل الخامات يسبب إصابة **العاملين** و تلف **الخامات** نتيجة عمليات التحميل	2	3	6	- عمل خطة رفع عند استخدام معدات ميكانيكية - توفير اغطية طرفية للمواسير - فحص المعدات المؤجرة (معدات المقاول) عن طريق قائمة الفحص - مراجعة شهادات الرفع للاوناش - عمل حواجز بشرائط حول منطقة العمل - وضع لوحات ارشادية - توفير صندوق اسعافات اولية - التاكد من الاحكام الجيد للطرود و الخامات - استخدام مهمات الوقاية المناسبة للنشاط	2	1	2	- اصدار تعليمات أعمال الرفع والتحميل -SG_F ((39)) - اصدار تعليمات أستخدام وتداول مواسير البولي إيثيلين والخامات الخاصة بها (SG_F- (12-13))	P2
٤		**اجهاد حراري**	تعرض **العاملين** لحالات الاغماء نتيجة ضربات الشمس و ارتفاع درجه الحرارة	2	2	4	- تقليل عدد ساعات العمل فى وقت الظهيرة - توفير زجاجات مياه للعمال - ارتداء مهمات الوقاية المناسبه - قياس الوطأة الحرارية	2	1	2	- اصدار تعليمات العمل في الطرق أو العراء (SG_F- (11)	P3
٥	**الحركة والانتقال بالسيارات**	**النقل**	أصابة**العاملين** بسبب حوادث الطرق	3	2	6	- يتم استخدام سائقين مؤهلين -إتباع تعليمات القيادة الآمنة - متابعة السيارات عن طريق ال GPS	2	1	2	- تدريب السائقين على القيادة الدفاعية - الكشف الدورى على السائقين و تحليل مفاجىء للمواد المخدرة لهم	P2

تحليل مدخلات ومخرجات العمليات

Input / Output Data Screening Sheet

الموقع : مشروع (المشروعات)

العملية : اعمال شبكات

العملية : اعمال تركيبات

المدخلات Inputs (Manpower, Material &Equipment)	المخرجات Outputs
مهندسين + فنيين + إداريين +عمال	شبكة متكاملة
عدد وأدوات	رسومات هندسية وبيانات
مواسير	غازات عوادم المعدات
معدات حفر ميكانيكي – يدوي	غبار
معدات ضغط هواء	ضوضاء
معدات لحام	نواتج الحفر
رسومات هندسية	ردم الحفرية ودك التربة
سيارات للنقل والتنقلات	نظافة الموقع
مجرفة (بوب كات) + رولر كومباكتر + قلابات	إعادة طبقات الاسفلت
مواد الأسفلت	

جدول تسجيل وتقييم مخاطر السلامة والصحة المهنية

م No	النشاط Activity	الخطر Hazard	الاثار المترتبة Consequences	تحليل الخطر Risk Analysis			اجراءات التحكم المطلوب تنفيذها Required Control Measures	Risk Analysis (Existing Ctrl) تحليل الخطر بعد التحكم			اجراءات التحكم اضافية Aditional Control Measures	الأولوية priority
				S الشد	P الاحتمال	R الخطر		S الشد	P الاحتمال	R الخطر		
شبكات												
١	**الحركة والانتقال بالسيارات**	**النقل**	أصابة**العاملين** بسبب حوادث الطرق	3	2	6	- عدم ركوب عدد زائد عن المسموح بهو عدم الركوب بصندوق السيارة - التأكد من تثبيت المواسير على سطح السيارة و ربطها - عدم تخطي البروز المذكورة برخصة السيارة - يتم استخدام سائقين مؤهلين - توجد تعليمات القيادة الآمنة - متابعة السيارات عن طريق ال GPS	2	1	2	- تدريب السائقين على القيادة الدفاعية - الكشف الدورى على السائقين و تحليل المواد المخدرة لهم	P2
٢	**رفع و تنزيل الخامات**	**رفع و تحميل بإستخدام معدات ميكانيكية**	تحميل وتنزيل الخامات يسبب إصابة **العاملين** و تلف **الخامات** نتيجة عمليات التحميل	2	3	6	- عمل خطة رفع عند استخدام معدات ميكانيكية - توفير اغطية طرفية للمواسير - فحص المعدات المؤجرة (معدات المقاول) عن طريق قائمة الفحص - مراجعة شهادات الرفع للاوناش	2	1	2	- اصدار تعليمات أعمال الرفع والتحميل SG_F-((39)) - اصدار تعليمات أستخدام وتداول مواسير البولي إيثيلين والخامات الخاصة بها (SG_F- (12-13))	P2

					- عمل حواجز بشرائط حول منطقة العمل - وضع لوحات ارشادية - توفير صندوق اسعافات اولية - التاكد من الاحكام الجيد للطرود و الخامات - استخدام مهمات الوقاية المناسبة للنشاط						
٣	**معدات مؤجرة**	**ميكانيكية**	اصابة **العاملين** بسبب الاجزاء الدوارة و الحادة	3	2	6	- عزل المكان بحواجز يمنع دخولها غير المخصصين العمل داخلها - فحص المعدات المؤجرة عن طريق قائمة الفحص المخصصة - تنفيذ محاضرات توعية باجراءات السلامه و الصحه المهنيه - ارتداء مهمات الوقاية اللازمة	2	1	2	- اصدار تعليمات الأعمال الخطرة (SG_F- 18))	P2
٤	**اعمال اللحام**	**الحريق**	حريق ببعضالخاماتالمتواجده فى منطقة العمل مما يسبب أتلاف **الخامات** المتواجده او اصابة **القائمين على العمل .**	3	2	6	- منع التدخين او استخدام اي مصدر اشتعال بمنطقة العمل - توفير استعدادات الحريق من طفايات و بطاطين للحريق - موقع العمل مفتوح - ارتداء مهمات الوقاية اللازمة	3	1	3	- تحديد منطقة العمل بشريط فسفوري - تخصيص مكان للتدخين بعيد عن منطقة العمل - إدراج الحريق في خطة الطوارئ - توفير شنطة اسعافات اولية	P1

٥		**الكهرباء**	التعامل مع الكهرباء مما يؤدي لاصابة **العاملين** بالصعق الكهربي	2	2	4	- فحص دوري للوصلات الكهربائية - اتمام العمل عن طريق شخص مختص - توفير العدد المناسبة لاعمال الكهرباء - اغلاق مصادر الطاقة و وضع لافتات عليها	2	1	2	- معايرة ماكينات اللحام و كومبيوتر اللحام - اصدار تعليمات أعمال الكهرباء (SG_F- 23))	P2
٦		**اجهاد حراري**	الاجهاد الحراري **للعامل** الناتج عن المعده المستخدمه للحام	2	2	4	- توفير صندوق اسعافات اولية - قياس الوطأه حراريه - ارتداء مهمات الوقاية اللازمة	2	1	2	- تقليل عدد ساعات التعرض - توفير زجاجات مياه لتقليل الاثر الحراري	P3
٧		**انهيار اللحام**	تسريب الغاز عند التدفيع ناتج عن لحام بشكل خاطئ او انهيار اللحام مما يسبب تلف **الخامات**	2	2	4	- اتمام العمل عن طريق شخص مختص و توفير الشهادات الخاصة باللحامين - توفير شهادات اختبار اللحام للخامات	2	1	2	- الكشف الطبي على العاملين باعمال اللحام	P1
٨	**استخدام العدد اليدوية**	**عدد اليدوية**	استخدام العدد اليدوية بطريقة خاطئة او عدد تالفة قد تؤدي لاصابات خطيرة **للعاملين** بها	2	2	4	- الفحص الدائم للعدد المستخدمه - ابعاد كل العدد الغير صالحه للاستخدام - توفير صندوق اسعافات اولية - الإهتمام بالترتيب والنظافة - استخدام مهمات الوقاية المناسبة للنشاط - التدريب علي استخدام العدد اليدوية	2	1	2	- اصدار تعليمات النظافة والترتيب (SG_F- (42) - اصدار تعليمات استخدام العدد اليدوية (SG_F- (2))	P2

٩		**سقوط**	سقوط**العاملين** و **الماره** باحد مواقع الحفر او الاصطدام باحدى السيارات بالطريق مسببا اصابات للعاملين	3	2	6	-تحديد مواقع العمل بحواجز - توفير لافتات ارشادية و شريط تحذير - وضع مشايات على الحفر لمساعدة المارة فى التنقل - ارتداء مهمات الوقاية اللازمه لهذا العمل - توفير شنطة اسعافات اولية بالموقع	3	1	3	- اصدار تعليمات العمل في الطرق أو العراء (SG_F- (11)) - ارتداء العاملين لسترات بها عواكس ضوئية	P1
١٠		**اجهاد حراري**	تعرض **العاملين** لحالات الاغماء نتيجة ضربات الشمس و ارتفاع درجه الحرارة	2	2	4	- تقليل عدد ساعات العمل فى وقت الظهيرة - توفير زجاجات مياه للعمال - ارتداء مهمات الوقاية المناسبه - توفير شنطة اسعافات اولية بالموقع - قياس الوطأة الحرارية	2	1	2	- اصدار تعليمات العمل في الطرق أو العراء (SG_F- (11))	P3
١١		**نواتج حفر**	عرقله **العاملين** و السقوط بسبب مخلفات الناتجه عن الحفر	2	2	4	- الزام المقاولون بالتعاقد مع شركات لنقل نواتج الحفر و التخلص منها - وضع ناتج الحفر جانب موقع الحفر على بعد لا يعيق عمل بالموقع	2	1	2	- اصدار تعليمات أعمال الحفر للشبكات (SG_F- (10)) - توفير شنطة اسعافات اولية	P2
١٢		**غبار**	الابخرة تسبب مشاكل صحية بالجهاز التنفسي**للعاملين** نتيجة إستنشاق الابخرةالناتجة عن عملية الحفر و الردم	2	3	6	- عزل المكان بحواجز يمنع دخولها غير المخصصين العمل داخلها - العمل بمكان	2	1	2	- الكشف الطبي على العاملين باعمال الحفر	P2

					مفتوحذو تهوية جيدة - تقليل ساعات العمل - توفير كمامات للافراد العاملين - استخدام مهمات الوقاية المناسبة للنشاط						
١٣	**العمل بألات الحفر JACK) (HAMMER**	**الأهتزاز**	التعرض للإهتزاز قد يؤدي الي إصابات **العمود الفقري** اصابة **المرافق العامه**	3	2	6	- يتم تبديل العاملين بإستمرار لتقليل زمن التعرض للإهتزاز - يتم عمل مجسات يدوية على اماكن الكابلات و المرافق - تنسيق مع هيئة المرافق و الحصول على خرائط للمرافق - فحص بصفة دورية للمعدات المستخدمه - استخدام الحفر اليدوى عند ظهور مرافق قريبه من مكان الحفر - ارتداء مهمات الوقاية اللازمة	2	1	2	- اصدار تعليمات أعمال الحفر للشبكات (SG_F- (10))	P2
١٤		**حريق**	حريق**بالكمبروسور**المتواجد لتشغيل ال JACK HAMMER حريق ببعض **الخامات**	3	2	6	- توفير اجهزة اطفاء اللازمه - عدم وضع اى شئ غير خاص بالمعده داخلها - فحص بصفة دورية للمعدات المستخدمه - ارتداء مهمات الوقاية اللازمة	2	1	2	- إدراج الحريق في خطة الطوارئ - توفير شنطة اسعافات اولية	P1
١٥	**تمديد المواسير بالشبكة**	**سقوط**	تلف **المواسير** من عمليات التحميل والتنزيل إصابة **العاملين** نتيجة عمليات التحميل والتنزيل	2	2	4	- عمل خطة رفع جماعي - توفير سائقين مؤهلين لنقل للمعدات - عمل حواجز وشريط	2	1	2	- اصدار تعليمات أعمال الرفع والتحميل (SG_F- (39))	P1

				تحذير وتمييز المكان بلوحات منطقة عمل - توفير صناديق إسعافات أولية بالموقع - ارتداء مهمات الوقاية اللازمة						
تركيبات											
١٦	**العمل علي ارتفاع**	**سقوط**	استخدام ادوات الحادة من علي ارتفاع (سقالة) مما ينتج إصابة وجروح**للعاملين**	3	2	6	- حمل العدة بحقائب مناسبة و منع التشوين علي السقالة - عمل حواجز بشرائط حول السقالات - فحص السقالة عن طريق نموذج الفحص الخاص بها - تصريح السقالة موجود و مكتمل البيانات - يتم استخدام مهمات الوقاية الشخصية للعاملين من الخوذ والأحذية و احزمة الأمان	2	1	2	- ترك مسافة وقائية بين السقالة و خطوط نقل الكهرباء	P1
١٧		**سقوط**	سقوط **العمال** من ارتفاع (سقالة) مما ينتج إصابة العمال او الوفاه	3	2	6	- يتم استخدام احزمة امان و فحصها - الكشف الطبي على العاملين علي السقالات للتاكد من اللياقة الطبية - يتم استخدام مهمات الوقاية الشخصية للعاملين من الخوذ والأحذية و احزمة الأمان	2	1	2	- ترك مسافة وقائية بين السقالة و خطوط نقل الكهرباء	P1
١٨		**سقوط**	انهيار **السقالة**مما ينتج إصابة **العمال** او الوفاه	3	2	6	- تركيب السقالة عن طريق مختص - الربط الايجابي	2	1	2	- ترك مسافة وقائية بين السقالة و خطوط نقل الكهرباء	P1

					٥٠% فاكثر - عمل حواجز بشرائط حول السقالات - فحص السقالة عن طريق نموذج الفحص الخاص بها - تصريح السقالة موجود و مكتمل البيانات - يتم استخدام مهمات الوقاية الشخصية للعاملين من الخوذ والأحذية و احزمة الأمان						
١٩	**استخدام العدد اليدوية**	**بيئة العمل**	تناثر العدد و الخامات علي ارضية منطقة العمل مما قد يسبب السقوط **العاملين** و اصابة **العاملين** بسبب عدم صالحية المعدات المستخدمة	2	2	4	- الفحص الدائم للعدد المستخدمه - ابعاد كل العدد الغير صالحه للاستخدام - توفير صندوق اسعافات اولية - الإهتمام بالترتيب والنظافة - استخدام مهمات الوقاية المناسبة للنشاط - التدريب علي استخدام العدد اليدوية	2	1	2	- اصدار تعليمات النظافة والترتيب (SG_F- (42)) - اصدار تعليمات استخدام العدد اليدوية (SG_F- (2))	P3
٢٠	**تخزين المهمات للقفاص**	**بيئة العمل**	تناثر العدد و الخامات بالقفص مما قد يسبب اصابة **العاملين**	2	2	4	- الفحص الدائم للعدد المخزنة - ابعاد كل العدد الغير صالحه للاستخدام - الإهتمام بالترتيب والنظافة بالقفص - توفير صندوق اسعافات اولية	2	1	2	- اصدار تعليمات النظافة والترتيب (SG_F- (42)) - اصدار تعليمات استخدام العدد اليدوية (SG_F- (2))	P3

تحليل مدخلات ومخرجات العمليات

Input / Output Data Screening Sheet

الموقع : مشروع (عام)

العملية : الأعمال الإدارية (مباني ادارية)

المدخلات Inputs (Manpower, Material &Equipment)	المخرجات Outputs
مهندسين + موظفين إداريين	أعمال إدارية
أثاث مكتبي + أجهزة حاسوب	بيانات ومعلومات وأوراق
أجهزة وأدوات مكتبية	مياه صرف
بيانات ومعلومات وأوراق	قمامه عامة
مياه	
طاقة كهربية	
إضاءة	

جدول تسجيل وتقييم مخاطر السلامة والصحة المهنية

م No	النشاط Activity	الخطر Hazard	الاثار المترتبة Consequences	تحليل الخطر Risk Analysis			اجراءات التحكم المطلوب تنفيذها Required Control Measures	Risk Analysis (Existing Ctrl) تحليل الخطر بعد التحكم			اجراءات التحكم اضافية Aditional Control Measures	الأولوية priority
				S الشد	P الاحتمال	R الخطر		S الشد	P الاحتمال	R الخطر		
١	أعمال إدارية بالمباني	**بيئة العمل**	اصابة العمود الفقري والمفاصل**للعاملين** نتيجة الاستخدام طويل المدى نتيجة استخدام الحاسب الآلي	2	2	4	- تجهيزات مكتبية كافية وآمنة - اصدار تعليمات بكيفية بالاستخدام السليم للحاسب الآلي و تقليل مدد التعرض	2	1	2	- اصدار تعليمات النظافة والترتيب ((SG_F- (42)) - اصدار تعليمات المكاتب ((SG_F- (43))	P3
٢		**الكهرباء**	التوصيلات الكهربائية غير الجيدة بالمكاتب قد تسبب الصعق الكهربي **للعاملين**	2	2	4	- فحص دوري للوصلات الكهربائية - اتمام العمل عن طريق شخص مختص - توفير العدد المناسبة لاعمال الكهرباء - اغلاق مصادر الطاقة و وضع لافتات عليها	2	1	2	- اصدار تعليمات أعمال الكهرباء (SG_F- 23))	P2
٣		**الحريق**	تلف **الممتلكات** أو إصابة **الأفراد** نتيجة التدخين أو أعمال البوفيه	3	2	6	- توفير انظمة الاطفاء و الانذار المناسبة - توفير استعدادات الحريق من طفايات و بطاطين للحريق - منع التدخين بالاماكن غير المخصصة	2	1	2	- تخصيص اماكن للتدخين - عمل تدريبات للتعامل في حالة حدوث حريق - توثيق خطة الاستعداد والاستجابة لحالات الحريق - اجراء تجارب الطوارئ و الاخلاء	P1
٤		**بيئة العمل**	فقر النظافة العامة والترتيب وتراكم القمامة و المخلفات وانتشار الأمراض وسوء	2	2	4	- تنظيف دورات المياة بصفة دورية - المراجعة الدورية	2	1	2	- اصدار تعليمات النظافة والترتيب ((SG_F- (42))	P3

			المظهر العام مسببا نقل العدوى والأمراض بين **العاملين**				لنظافة دورات المياه - الفحص الدوري للترتيب و النظافة					
٥		**بيئة العمل**	نقل العدوى بين **العاملين**في حالة نقص التهوية	2	2	4	- المراجعة الدورية لانظمة التهوية و التكييف المركزي - الفحص الدوري للترتيب و النظافة - الالتزام الاجراءات الاحترازية بفيروس كورونا المستجد	2	1	2	- اصدار تعليمات النظافة والترتيب (SG_F- (42))	P3
٦		**الاضاءة**	إجهاد **العاملين** وإصابتهم بضعف النظر في حالة ضعف مستوى الإضاءة	2	2	4	- يتم توفير إضاءة جيدة للمكاتب - القياس الدوري لمستويات الاضاءة	2	1	2	- اصدار تعليمات المكاتب (SG_F- (43))	P3
٧		**الضوضاء**	إصابة **العاملين** بتلف سمعي مؤقت	2	2	4	- القياس الدوري لمستويات الصوت - تقليل عدد العاملين بكل غرفة - فحص دوري للاجهزة المسببة للضوضاء	2	1	2	- اصدار تعليمات المكاتب (SG_F- (43))	P3

تحليل مدخلات ومخرجات العمليات

Input / Output Data Screening Sheet

الموقع : مشروع (عام)

العملية : نقل عدوى (كورونا)

المدخلات Inputs (Manpower, Material &Equipment)	المخرجات Outputs
مهندسين + موظفين + إداريين	أعمال إدارية + اعمال تخصصية
مباني ادارية + مناطق عمل	بيانات ومعلومات وأوراق
أثاث مكتبي + أجهزة حاسوب + معدات	مياه صرف
وسائل مواصلات	مخلفات صحية
أجهزة وأدوات مكتبية	
بيانات ومعلومات وأوراق	
مياه + كمامات+ ترمومترات + ادوات التعقيم والتطهير	

جدول تسجيل وتقييم مخاطر السلامة والصحة المهنية

م No	النشاط Activity	الخطر Hazard	الاثار المترتبة Consequences	تحليل الخطر Risk Analysis			اجراءات التحكم المطلوب تنفيذها Required Control Measures	Risk Analysis (Existing Ctrl) تحليل الخطر بعد التحكم			اجراءات التحكم اضافية Aditional Control Measures	الأولوية priority
				S الشد	P الاحتمال	R الخطر		S الشد	P الاحتمال	R الخطر		
١	**الحركة والانتقال بالسيارات**	**النقل**	نقل عدوى ال بين **المسافرين** و **الركاب**	3	2	6	- تأجيل الرحلات وعقد الإجتماعات عبر الفيديو(برنامج zoom) - تجهيز السيارات بمعقمات كحولية كافية - الزام الركاب ارتداء الكمامة الطبية	3	1	4	- اصدار تعليمات النظافة والترتيب (SG_F- (42)) - اقامة دورات ارشادية عن الوقاية من الاصابة بالفيروس و رفع الوعي بين الموظفين	P2
٢	**تسجيل الحضور بنظام البصمة**	**بيئة العمل (كورونا)**	نقل عدوىبين **العاملين**عند الحضور	3	2	6	- توقف العمل بنظامبصمة اليد - تسجيل الحضور بالعمل بنظامبصمة الوجه - القياس والتسجيل اليومي لدرجات الحرارة للعاملين - توفير الكمامة الطبية وتسليمه للموظف - تنفيذ مسافة آمنة على الأقل ١ متر	3	1	3	- اصدار تعليمات النظافة والترتيب (SG_F- (42)) - اقامة دورات ارشادية عن الوقاية من الاصابة بالفيروس و رفع الوعي بين الموظفين	P2
٣	**اعمال البوفيه**	**بيئة العمل (كورونا)**	نقل عدوىبين **العاملين**من عاملي البوفيه	3	2	6	- القياس والتسجيل اليومي لدرجات الحرارة للعاملين - توفير الكمامة الطبية و القفاز الطبي وتسليمه للموظف - منع استخدام الاكواب الزجاجية و تقديم	3	1	3	- اصدار تعليمات النظافة والترتيب (SG_F- (42)) - اقامة دورات ارشادية عن الوقاية من الاصابة بالفيروس و رفع الوعي بين الموظفين	P2

			المشروبات في اكواب ورقية								
٤	**اعمال عامة**	**بيئة العمل (كورونا)**	نقل عدوىبين **العاملين**و **العملاء**	3	2	6	- القياس والتسجيل اليومي لدرجات الحرارة للعاملين و الزوار و العملاء - توفير الكمامة الطبية وتسليمه للزوار و العاملين و ارتدائها بكافة مناطق العمل - التعامل مع العملاء من شباك خدمة العملاء - توفير مكان لانتظار العملاء خارج المقرات الادارية - منع استخدام الاكواب الزجاجية و تقديم المشروبات في اكواب ورقية - منع تناول المشروبات عند العملاء - تنفيذ مسافة آمنة على الأقل ١ متر - تعقيم الاسطح والارضيات بالمقرات الادارية و المحاطات و الاستراحات توفير ادوات التعقيم الكحولية للايدي بكافة مباني الشركة	3	1	3	- اصدار تعليمات النظافة والترتيب ((SG_F- (42) - اقامة دورات ارشادية عن الوقاية من الاصابة بالفيروس و رفع الوعي بين الموظفين - تكثيف اجراءات المرور الدوري علي الحمامات	P2

Attachment -2: LDC HSE Instructions

QHSE manual

Quality, Health, Safety & Environment Manual

Issue #	Date	Amendment Record	Reviewed by Management Rep.	Approved by CEO
1	1/6/2017	1st Issue		
2	1/11/2019	All items to satisfy the new issue of ISO 45001-2018		

1- About this manual

1-1 CONTENTS

1-2 Manual Administration

- The main purpose of this Manual is to document the management system of **Sinai Gas.** to guide its employees regarding the actions that affect quality, environment, and safety.
- This Management System Manual is the intellectual property of **Sinai Gas** and may not be copied in whole or part or transmitted to any third party without the express written permission of the company's Chairman.
- No copies shall be issued externally and the copies available on site are for internal use only.
- Where copies of supporting procedures are issued externally, they are for information purposes only.
- The company's Chairman and the Quality Manager shall review the effectiveness and suitability of the Management System at least once a year. As well as the Management System documentation, the whole scope of this Manual shall also be reviewed.
- Where the system is found to be ineffective as a result of the changing needs of **Sinai Gas**'s, amendments shall be made to this manual.
- Every issue replaces and cancels all previous issues and amendments.
- Each issue is identified with a new issue number.

1-3 Scope and Field of Application

This manual and its contents apply to **Sinai Gas** which undertakes the activities of Design, installation OF DESIGN, EXECUTION, OPERATION &MAINTENANCE OF PRESSURE REDUCTION STATIONS, INSATALLATIONS& DISTRIBUTION OF NATURAL GAS NETWORKS FOR DOMESTIC, and COMMERCIAL & INDUSTRIAL CUSTOMERS

Integrated Management System & this manual **cover** all elements that required in the international standards (*ISO-9001-2015, ISO 14001-2015 & ISO 45001-2018)*

2- About Sinai Gas

2-1 Overview

Sinai Gas is one of Egyptian natural gas holding (**EGAS**) companies of petroleum sectors.
Sinai Gas works in field of DISTRIBUTION OF NATURAL GAS NETWORKS FOR DOMESTIC, and COMMERCIAL & INDUSTRIAL CUSTOMERS, is aligning its business practices and principles by committing to excellence in the health safety and environmental performance of our employee, customers and communities through strict adherence to standards providing a safe workplace for our employees and preserve the environment of the community surrounding our facilities in accordance with these goals the **Sinai Gas** H.S.E.
Sinai Gas was Established in (15/3/2009) in accordance with the investment law number 8 of year 1997

2-2 Contact Guide

Address :6 A st.maadi-sarayat
Fax : (+202)23597067
Telephone : (+202)23597202
Web Site : www.sinaigas.com

2-3 Mission, vision and Commitment

- **Company Mission**

Achieve excellence in providing integrated services and solutions to our customers by adhering to the highest standards and rates of quality, safety, occupational health and environmental protection through the continuous development of operational processes, customer service and the level of performance of the workers.

- **Company Vision**

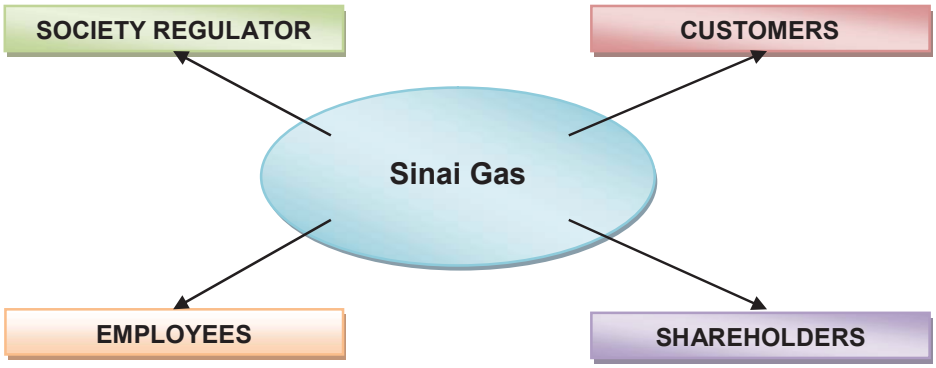
To become a leading company in the field of natural gas delivery by providing services for construction, operation and maintenance of gas networks to implement the policy of the State in order to meet the growing needs of clean energy for all customers.

- **Company Values**

We value our customers, our communities and our company.

- **Commitment to Stakeholders**

We recognize that we can only deliver and sustain our Mission and achieve our Vision if we understand, account for and balance the needs of the four major stakeholders in our business – regulators, customers, employees and the shareholders.



Our guiding principles relating to our stakeholders are:

Society

- To protect the society at large by maintaining a clean environment free of pollution and wastes and to support the national economy as a natonal company specialized in such sector.

Customers

- To provide value-added services that consistently meets agreed requirements and specifications.
- To accept contracts only if we can meet customers' requirements and where those requirements are compatible with our expertise and business activities

Employees

- To ensure that all employees are qualified, trained and motivated.
- To ensure that the working environment and conditions are conductive for effective working and constitute minimum hazards for all employees.

Shareholders

- To deliver services at quality while considering legal , ethical and technical requirements.
- To plan and undertake business opportunities in a professional manner, weighing risk exposure against identified returns.

Our integrated Management System is the vehicle for capturing the requirements of our customers and proactively managing their delivery. It also provides the foundation for continual improvement, to which we are committed in all areas of our operations.

3- About QHSE management system of Sinai Gas

3.1 Overview

Sinai Gas Management System comprises the core business processes and the main supporting processes in additional to QHSE procedures.

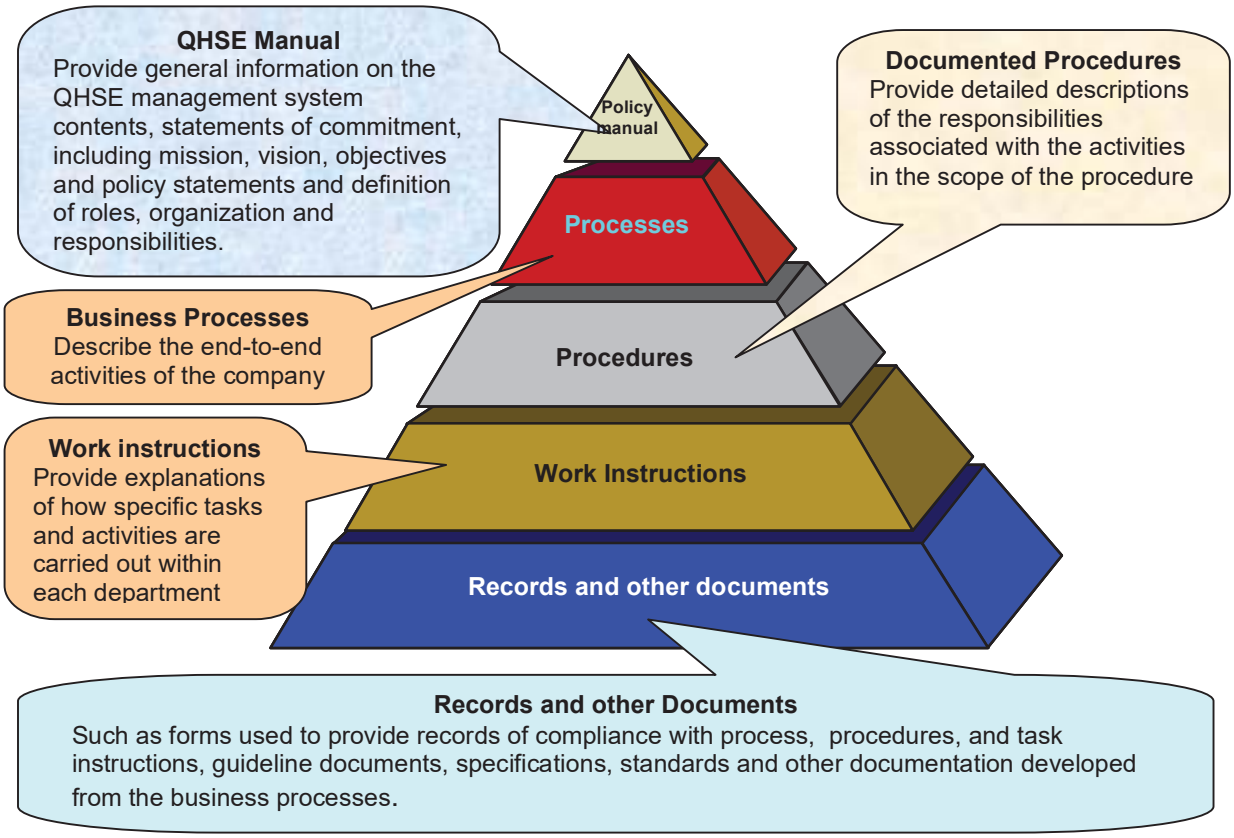
The business process model (included in Section 3.4) represents how we turn business opportunity into profitable outcomes through satisfied customers. Its effectiveness is maintained and enhanced by our supporting procedures.

The core processes, supporting processes and procedures cross-organizational boundaries, which enable everyone to have a clear focus on the requirements that have to be satisfied for the business to be successful.

The structure documentation of the QHSE Management System identifies what activities are carried out in the business and provides foundation from which we can identify improvements and implement best practice.

3.2 The QHSE Management System Structure

Sinai Gas Integrated Management System consists of a hierarchy of documents as follows:



3-3 QHSE Policy Statement

Sinai Gas works on the transfer and distribution of gas in the concession area east of the Suez Canal and other areas of excellence in accordance with the highest levels of quality, specifications and international codes, to satisfy customers and their expectations.

The Chairman of the Board of Directors affirms his commitment and responsibility for the implementation of an integrated system of quality management, environment, safety and occupational health of the company, in addition to the members of the senior management of the company consider the implementation of the system and development of the most important functions, and therefore manage and encourage the company employees to implement the system and confirm its effectiveness

The senior management of Sinai Gas Company confirms its position as a leading company in the transportation and distribution of gas through:

1- Research to secure various sources of skilled labor, modern technology and scientific knowledge, taking into consideration the best quality and the lowest prices
2- Continuous improvement in management system and process performance to reduce product costs to increase competitiveness, expand marketing opportunities and satisfy customers, employees and the community
3- Always recognize customers' wishes to ensure that our services are able to meet their needs and expectations.
4- Conformity with the laws, obligations and standards relating to our services and our work activities and the environmental and occupational safety and health damage
5- Reduce pollution from our operations and protect the environment in general
6- Ensure the safety of workers and property during work, prevent accidents and reduce the damage and diseases of the profession.
7- To develop the skills of the employees in the continuous training and raise their performance.
8- Provide the conditions and services suitable for employees to increase their affiliation and cooperation in the application of quality and environmental regulations and occupational safety and health and the realization of the policy and objectives of the company.

Sinai Gas is committed to:-

Communicate this policy to all employees in the company and the customer of the company.
Continually review the policy to ensure the adequacy and the matching with the company strategy and services.
Continually review the policy to ensure its cover the customer requirements and the legal requirements.
This review will be through the planned integrated review and the internal audits

Chairman
Eng. Mahmoud Anwer

3-4 Sinai Gas QHSE Objectives

Quality, environmental, occupational health and safety objectives of **Sinai Gas** are set on annual basis for improving QHSE performance in all departments. Achievement and follow up results of such objectives are reported for management review.

3-5 Sinai Gas Organizational Structure and relationships:

The following figure illustrates the organizational chart of **Sinai Gas**

3-6 Sinai Gas Key Responsibilities and Authorities

The responsibilities and authorities of key personnel are demonstrated clearly keeping in view the main activity of each department.

The Top management are responsible for ensuring the continuous, fully effective implementation and functioning of the individual processes and of the overall Management System through continuing compliance with the established documented practices, methods, techniques and general requirements.

The assigned Process Owners are responsible for ensuring that SG Specialities processes are technically capable of consistently achieving their required objectives.

General responsibilities and authorities are defined in the approved Job Descriptions which are maintained and controlled by the Administration Department of SG Specialities, and within each section for its specified jobs.
Also key responsibilities for personnel involved in any of the Management System processes are addressed within each procedure describing this process.

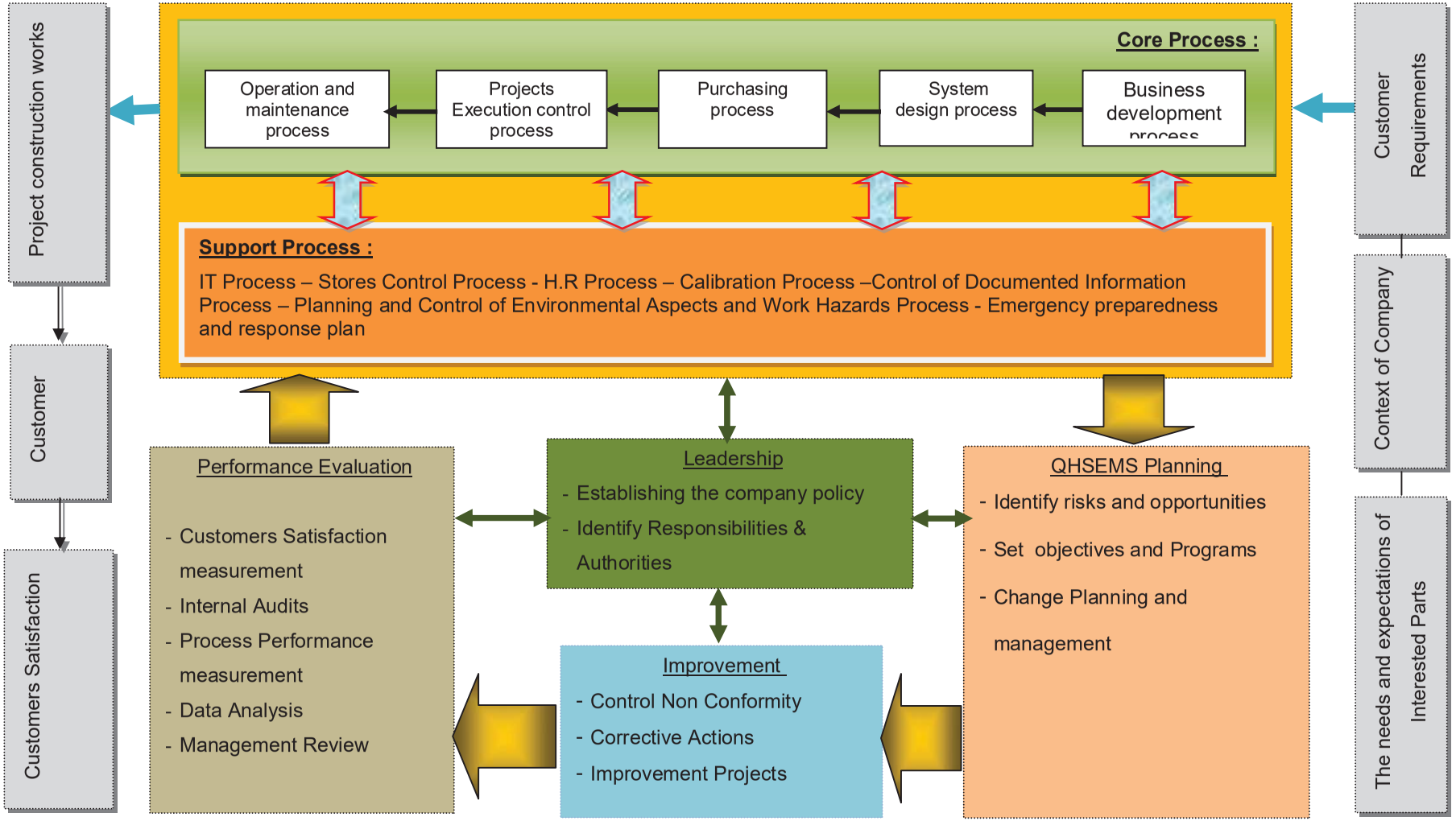
The General Manager is responsible for formulating the company policy. He is also responsible for formulating the company main objectives and targets.

All employees in the company are responsible for meeting the requirements of agreed procedures, plans and controls and for conducting themselves in accordance with approved practices.

In the event of personnel absences, authority reverts to the source of delegation as defined by the organization chart, unless limited authority and responsibility are delegated to other personnel via memoranda.

General responsibilities and authorities are defined in Job Description for all functional heads, supervisory and administrative levels. All non-supervisory staff has authority based on competence to perform various tasks. In addition, responsibilities and authorities are defined in documentation such as processes, procedures and work instructions.

3-7 Sinai Gas Business Processes Model



3-8 list of management system supporting procedures

procedure name	Code number
Technical studies process	SG-P-01
System Design process	SG-P-02
Projects execution & management process	SG-P-03
Procurement process	SG-P-04
Maintenance and Operating process	SG-P-05
Storage Process	SG-P-06
Human Resources process	SG-P-07
Calibration process	SG-P-08
Infra-Structure maintenance	SG-P-09
Control of Documented information Process	SG-P-10
HSE planning and control process	SG-P-11
Emergency preparedness and response procedure	SG-P-12
Performance Evaluation Process	SG-P-13
Improvement Process	SG-P-14
Management system planning process	SG-P-15
Leadership Process	SG-P-16

4. Compliance Matrices

4-1 Compliance with Requirements of ISO 9001:2015

Following table is a compliance matrix that clearly illustrates how the company's quality management system fulfils requirements of the international standard *(*ISO 9001:2015*)*

ISO 9001: 2015 Elements		Policy of application	Supporting Doc. code #	Remarks
4	*Context of the organization*			Title
4.1	Understanding the organization and its context	Generic context of the organization is identified, evaluated and response actions are recommended within each management review.	SG-P-16	
4.2	Understanding the needs and expectations of interested parties	Interested parties are identified. Their expectations are recognized and understood. Respond to interested parties expectations are reviewed and recommended in each management review.	SG-P-16	
4.3	Determining the scope of the quality management system	Scope of **Sinai Gas** is identified as **DESIGN, EXECUTION, OPERATION &MAINTENANCE OF PRESSURE REDUCTION STATIONS, INSATALLATIONS& DISTRIBUTION OF NATURAL GAS NETWORKS FOR DOMESTIC, and COMMERCIAL & INDUSTRIAL CUSTOMERS**	SG-P-16+ page 3 of this manual	
4.4	Quality management system and its processes	QMS is established on the process approach principal within an integrated management system. Each process is identified in separate document that illustrate its inputs, outputs, risks, opportunities and KPIs. The processes interrelations are illustrated in the business process model on page 10 of this manual	SG-P-16	
5	*Leadership*			Title
5.1	Leadership and commitment			Title
5.1.1	General	Management Personnel are keen to provides evidence of commitment to the development and improvement of the management system	QHSEM + SG-P-16	
5.1.2	Customer focus	Management ensures that customer needs and expectations are determined, converted into requirements, and fulfilled with the aim of achieving customer satisfaction.	SG-P-16	
5.2	Policy			Title
5.2.1	Establishing the quality policy	The Chairman of the company has defined and set the Company's Quality, Environmental, and Safety Policy statement after recognizing and understanding the company context.	SG-P-16+ GCQHSEM page (7)	
5.2.2	Communicating the quality policy	Company's policy is displayed at all areas of work for awareness and departmental managers are requested to explain the policy to their assigned personnel.	SG-P-16	
5.3	Organizational roles, responsibilities and authorities	Organizational chart is described on page 8 of this manual. It identifies functions and their interrelations within **Sinai Gas**. Each departmental manager maintains its own department organizational structure. **Sinai Gas** has defined and communicated these responsibilities in the form of job descriptions that are maintained by administration department.	SG-P-16+ GCQHSEM page (8)	

ISO 9001: 2015 Elements		Policy of application	Supporting Doc. code #	Remarks
6	*Planning*			Title
6.1	Actions to address risks and opportunities	Risk and opportunities are identified in each process when the management system documents are established first time. Risk and opportunity evaluation is performed and raised for management review on yearly basis	SG-P-15	
6.2	Quality objectives and planning to achieve them	The Chairman ensures that all department managers within **Sinai Gas** has established their objectives on yearly basis. These objectives should be measurable and consistent with the QHSE policy and include the commitment to continual improvement.	SG-P-15	
6.3	Planning of changes	Corrective action / change form is recorded, discussed, and approved before execution each change in management system or work processes to make sure that changes are performed based on planned actions.	SG-P-15	
7	*Support*			Title
7.1	Resources			Title
7.1.1	General	Personnel who are assigned responsibilities defined in the management system and organizational chart are deemed competent based on applicable education, training, skills, and experience.	SG-P-07	
7.1.2	People	Management reviews adequacy of resources all the time. Resources needs are addressed in management reviews. Personnel affairs department is responsible for people recruitment and appraisal of their performance.	SG-P-07	
7.1.3	Infrastructure	**Sinai Gas** provides and maintains its facilities to achieve the conformity of executed works, including workspace and associated facilities; equipment, hardware and software; and supporting services.	SG-P-07	
7.1.4	Environment for the operation of processes	**Sinai Gas** maintains its facilities based on the identification and management of the human and physical factors of the work environment needed to achieve conformity of works.	SG-P-07	
7.1.5	Monitoring and measuring resources			Title
7.1.5.1	General	Measuring instruments are listed and checked for validity before and after each job use. When calibration is required, a trusted calibration body is used for calibration.	SG-P-08	
7.1.5.2	Measurement traceability	The company implements a strict management system for calibration of its measuring equipment at accredited labs.	SG-P-08	

ISO 9001: 2015 Elements		Policy of application	Supporting Doc. code #	Remarks
7.1.6	Organizational knowledge	The company knowledge are put available via the access to internet and participation in international knowledge sources, Also, consultants are sleeked for consulting in each new technical issues.	SG-P-07	
7.2	Competence	Training need assessment is performed on annual basis. Training records are maintained to demonstrate competence of personnel and evaluation of training.	SG-P-07	
7.3	Awareness	Policy, procedures, and integrated management system components are the main issues of awareness that given to personnel as newly employed. Awareness of personnel is performed via awareness sessions or displayed instructions at work areas.	SG-P-07	
7.4	Communications	**Sinai Gas** has created appropriate processes to ensure communication between its various levels and functions regarding the processes of the management system and their effectiveness	--	
7.5	Documented information			Title
7.5.1	General	The Integrated management system documentation includes the QHSE manual + 16 process procedure documents + detailed work instructions for critical process + a lot of forms that are used for recording documented information. This documentation cover the integrated management system that satisfy the requirements of ISO 9001: 2015, ISO 14001: 2015 and ISO 45001:2018 standards. **Sinai Gas** QHSEMS documentation hierarchy is illustrated in page 6 of this manual.	SG-P-10	
7.5.2	Creating and updating	Each relevant department creates its related documentation. Quality manager reviews all documents before issue to maintain the integrity of the management system. The Chairman approves all new issues of documents as permission for implementation.	SG-P-10	
7.5.3	Control of documented information	Quality Assurance Department controls system documents and each relative technical department controls its own drawings and technical documents. Such controls include methods of issuance, deletions, amendments, and distribution of documents. Records are established and maintained to provide evidence of conformity to requirements.	SG-P-10	

ISO 9001: 2015 Elements		Policy of application	Supporting Doc. code #	Remarks
8	*Operation*			Title
8.1	Operational planning and control	Each technical Department prepares a Quality plan for the project during the tendering phase. Afterwards it plans and follow-up execution of project activities	SG-P-03 + SG-P-05	
8.2	Requirements for products and services			Title
8.2.1	Customer communication	Business development department is the focal pointof communication with customers. Most communications are via tenders invitations for projects. Quality Department is the focal point of handling customer complaints.	SG-P-02	
8.2.2	Determining the requirements for products and services	Customer requirements are adequately identified in tender documents. Project requirements are identified in technical codes and standards. All requirements are put available in tender documents.	SG-P-02	
8.2.3	Review of the requirements for products and services	Technical departments identify and review customer requirements during the tendering phase. The Chairman approves contracts before acceptance.	SG-P-02	
8.2.4	Changes to requirements for products and services	Changes to project requirements are identified , reviewed and approved as a new requirement for project. It should be documented and approved by customer before acceptance.	SG-P-02	
8.3	Design and development of products and services			Title
8.3.1	General	Natural gas networks are designed by qualified team at design department. Department GM reviews design outputs. Verification of design is performed by customer approval of the design outputs. Validation of design is insured by startup measures performed by the operation tem.	SG-P-02	
8.3.2	Design and development planning			
8.3.3	Design and development inputs			
8.3.4	Design and development controls			
8.3.5	Design and development outputs			
8.3.6	Design and development changes			

ISO 9001: 2015 Elements		Policy of application	Supporting Doc. code #	Remarks
8.4	Control of externally provided processes, products and services			Title
8.4.1	General	**SINAI GAS** evaluates and selects its suppliers and subcontractors based on their ability to provide products and services in accordance with requirements.	SG-P-04	
8.4.2	Type and extent of control	Purchasing data are clearly stated on purchase orders and reviewed before submission to supplier and purchased products are inspected upon receiving. Project manager follows performance of subcontractors on daily basis.	SG-P-04	
8.4.3	Information for external providers	Purchasing data are clearly stated on purchase orders and reviewed before submission to supplier. Scope of work is specified in a contract with each subcontractor.	SG-P-04	
8.5	Production and service provision			Title
8.5.1	Control of production and service provision	Projects execution department is responsible for achieving project works physically on site. Operation department is responsible for operation and maintenance of cooling systems after establishment. Company QC personnel inspect achieved works before submission to customer. Daily, weekly, and monthly reports are issued to illustrate progress of project activities. Release of project works is performed via release notes. Operation log is maintained to demonstrate service provision status.	SG-P-03 + SG-P-05	
8.5.2	Identification and traceability	Excluded		NA
8.5.3	Property belonging to customers or external providers	Site premises are received, inspected and approved before starting project activities. In case of nonconformity or deterioration of site conditions, site conditions are claimed and reported to customer.	SG-P-03 + SG-P-05	
8.5.4	Preservation	Company's site is provided with adequate storage area to protect components and materials.	SG-P-06	
8.5.5	Post-delivery activities	The company grantees its achieved project works for a specified period according to contract with customer.	SG-P-03 + SG-P-05	
8.5.6	Control of changes	Change request is recorded and reviewed by top management before execution of changes related to quality management system.	SG-P-011	
8.6	Release of products and services	Executed job works are checked by client upon finished for release. Items are handed over by acceptance of client. Release of project works is performed via release notes record.	SG-P-03 + SG-P-05	
8.7	Control of nonconforming outputs	Nonconforming works that are addressed by customer inspection results are reworked until conforming. All nonconforming works are recorded and analyzed to identify the causes of nonconformity and take necessary corrective actions.	SG-P-03 + SG-P-05	

ISO 9001: 2015 Elements		Policy of application	Supporting Doc. code #	Remarks
9	*Performance evaluation*			Title
9.1	Monitoring, measurement, analysis and evaluation			Title
9.1.1	General	**SINAI GAS** plans and implements the measurement and monitoring activities needed to assure conformity and achieve improvement, This includes the determination of the need for, and use of, applicable methodologies including statistical techniques.	SG-P-13	
9.1.2	Customer satisfaction	**SINAI GAS** monitors information on customer satisfaction and/or dissatisfaction as one of the measurements of performance of the quality management system.	SG-P-13	
9.1.3	Analysis and evaluation	**SINAI GAS** collects and analyzes appropriate data to determine the suitability and effectiveness of the integrated management system and to identify improvements that can be made. This includes data generated by measuring and monitoring activities and other relevant sources.	SG-P-13	
9.2	Internal audit	**SINAI GAS** conducts internal audits to determine whether the management system conforms to the requirements of the integrated management system and has been effectively implemented and maintained. Qualified independent internal auditors conduct annual audits and results are reported to management.	SG-P-13	
9.3	Management review			Title
9.3.1	General	**SINAI GAS** management team reviews the management system at least twice per year to ensure its continuing suitability, adequacy and effectiveness.	SG-P-13	
9.3.2	Management review inputs	The management review evaluates any need for changes to Management System, including our quality, Safety and environmental policies and objectives.	SG-P-13	
9.3.3	Management review outputs	Management review outputs include recommendations for improvement and provision of needed resources.	SG-P-13	
10	*Improvement*			Title
10.1	General	Corrective action system is established for the purpose of improvement.	SG-P-14	
10.2	Nonconformity and corrective action	Corrective actions are taken to eliminate the cause of nonconformities in order to prevent recurrence. Corrective action is to be appropriate to the impact of the problems encountered.	SG-P-14	
10.3	Continual improvement	**SINAI GAS** plans and manages the processes necessary for the continual improvement of the quality management system	SG-P-14	

4-2 Compliance with Requirements of ISO 14001:2015

Following table is a compliance matrix that clearly illustrates how the company's quality management system fulfils requirements of the international standard *(ISO 14001:2015)*

ISO 14001: 2015 Elements		Policy of application	Supporting Doc. code #	Remarks
4	*Context of the organization*			Title
4.1	Understanding the organization and its context	Generic context of the organization is identified, evaluated and response actions are recommended within each management review.	SG-P-16	
4.2	Understanding the needs and expectations of interested parties	Interested parties are identified. Their expectations are recognized and understood. Respond to interested parties expectations are reviewed and recommended in each management review.	SG-P-16	
4.3	Determining the scope of the environmental management system	Scope of **Sinai Gas** is identified as **DESIGN, EXECUTION, OPERATION &MAINTENANCE OF PRESSURE REDUCTION STATIONS, INSATALLATIONS& DISTRIBUTION OF NATURAL GAS NETWORKS FOR DOMESTIC, and COMMERCIAL & INDUSTRIAL CUSTOMERS**	SG-P-16+ page 3 of this manual	
4.4	Environmental management system	EMS is established on the process approach principal within an integrated management system. Each process is identified in separate document that illustrate its inputs, outputs, risks, opportunities and KPIs. The processes interrelations are illustrated in the business process model on page 10 of this manual	SG-P-16	
5	*Leadership*			Title
5.1	Leadership and commitment	Management Personnel are keen to provides evidence of commitment to the development and improvement of the management system	QHSEM + SG-P-16	
5.2	Environmental policy	The Chairman of the company has defined and set the Company's Quality, Environmental, and Safety Policy statement after recognizing and understanding the company context. Company's policy is displayed at all areas of work for awareness and departmental managers are requested to explain the policy to their assigned personnel.	SG-P-16+ SGQHSEM page (7)	
5.3	Organizational roles, responsibilities and authorities	Organizational chart is described on page 8 of this manual. It identifies functions and their interrelations within **SINAI GAS**. Each departmental manager maintains its own department organizational structure. **SINAI GAS** has defined and communicated these responsibilities in the form of job descriptions that are maintained by administration department.	SG-P-16+ SGQHSEM page (8)	

ISO 14001: 2015 Elements		Policy of application	Supporting Doc. code #	Remarks
6	*Planning*			Title
6.1	Actions to address risks and opportunities			Title
6.1.1	General	Risk and opportunities are identified in each process when the management system documents are established first time. Risk and opportunity evaluation is performed and raised for management review on yearly basis	SG-P-15	
6.1.2	Environmental aspects	**SINAI GAS** identifies the environmental aspects of its activities and services that can control and over which it can be expected to have an influence, in order to determine those, which have or can have significant impacts on the environment.	SG-P-11	
6.1.3	Compliance obligations	The identification and provision of access to legal and other requirements to which the organization subscribes and that are directly applicable to the environmental aspects of its activities, products, or services are identified, listed and updated periodically.	SG-P-11	
6.1.4	Planning action	Environmental aspects are evaluated to recognize those, which have or can have significant impacts to the environment according to defined evaluation criteria. This information of significance is used as an input to the setting of environmental objectives and targets, and therefore is continuously reviewed and updated.	SG-P-11	
6.2	Environmental objectives and planning to achieve them			Title
6.2.1	Environmental objectives	The Chairman ensures that all department managers within **SINAI GAS** have established their objectives on yearly basis. These objectives should be measurable and consistent with the QHSE policy and include the commitment to continual improvement.	SG-P-11 SG-P-15	
6.2.2	Planning actions to achieve environmental objectives	Objectives and associated execution plans are set on accumulated program. The Quality Assurance Department is responsible for ensuring that a program is established and maintained for achieving the Quality, environmental & safety objectives and targets. The quality, environmental and safety management program applies to all relevant levels and functions of **SINAI GAS**. The quality, environmental and safety management program will be amended when necessary to cover projects relating to new developments, and new or modified activities, products and services.	SG-P-11 SG-P-15	

ISO 14001: 2015 Elements		Policy of application	Supporting Doc. code #	Remarks
7	*Support*			Title
7.1	Resources	Personnel who are assigned responsibilities defined in the management system and organizational chart are deemed competent based on applicable education, training, skills and experience. Human resources are evaluated on yearly basis within management review meetings. **SINAI GAS** provides and maintains its facilities to achieve the conformity of executed works, including workspace and associated facilities; equipment, hardware and software; and supporting services.	SG-P-07	
7.2	Competence	Training need assessment is performed on annual basis. Training records are maintained to demonstrate competence of personnel and evaluation of training.	SG-P-07	
7.3	Awareness	Policy, procedures, and integrated management system components are the main issues of awareness that given to personnel as newly employed. Awareness of personnel is performed via awareness sessions or displayed instructions at work areas.	SG-P-07	
7.4	Communication			Title
7.4.1	General	**SINAI GAS** has created appropriate processes to ensure communication between its various levels and functions regarding the processes of the management system and their effectiveness	SG-P-11	
7.4.2	Internal communication	Internal communications are insured via meeting, memos or verbal awareness of personnel	SG-P-11	
7.4.3	External communication	External communications are performed officially and mainly include awareness of policy and environmental requirements to interested parties.	SG-P-11	
7.5	Documented information			Title
7.5.1	General	The Integrated management system documentation includes the QHSE manual + 16 process procedure documents + detailed work instructions for critical process + a lot of forms that are used for recording documented information. This documentation cover the integrated management system that satisfy the requirements of ISO 9001: 2015, ISO 14001: 2015 & ISO 45001:2018. QHSEMS documentation hierarchy is illustrated in page 6 of this manual	SG-P-10	
7.5.2	Creating and updating	Each relevant department creates its related documentation. Quality manager reviews all documents before issue to maintain the integrity of the management system. The Chairman approves all new issues of documents as permission for implementation.	SG-P-10	
7.5.3	Control of documented information	Quality Assurance Department controls system documents and each relative technical department controls its own drawings and technical documents. Such controls include methods of issuance, deletions, amendments, and distribution of documents. Records are established and maintained to provide evidence of conformity to requirements.	SG-P-10	

ISO 14001: 2015 Elements		Policy of application	Supporting Doc. code #	Remarks
8	*Operation*			Title
8.1	Operational planning and control	HSE representative is assigned on site to supervise operational controls. Work instructions are established for each hazardous operation where needed. PPEs are used as applicable.	SG-P-11	
8.2	Emergency preparedness and response	Procedures and practices are established for preventing and responding to accidents and emergencies where they may be a significant impact on the environment or safety of personnel and property.	SG-P-11 SG-P-12	
9	*Performance evaluation*			Title
9.1	Monitoring, measurement, analysis and evaluation			Title
9.1.1	General	**SINAI GAS** defines, plans and implements the measurement and monitoring of its resulting environmental aspects. Based on environmental aspects evaluation, a monitoring plan is set for monitoring significant environmental aspects as needed. Such monitoring and measurement could be by self-efforts or through professional party.	SG-P-11	
9.1.2	Evaluation of compliance	Monitoring and measurements results are reported to management accompanied with notes to demonstrate legal compliance situation.	SG-P-11	N.A.
9.2	Internal audit			Title
9.2.1	General	**SINAI GAS** conducts internal audits to determine whether the management system conforms to the requirements of the integrated management system and has been effectively implemented and maintained.	SG-P-13	
9.2.2	Internal audit programme	Qualified independent internal auditors conduct annual audits and results are reported to management.	SG-P-13	
9.3	Management review	**SINAI GAS** management team reviews the management system at least twice per year to ensure its continuing suitability, adequacy and effectiveness. This review evaluates any need for changes to its integrated Management System, including our quality, Safety and environmental policies and objectives.	SG-P-13	
10	*Improvement*			Title
10.1	General	Corrective action system is established for the purpose of improvement.	SG-P-14	
10.2	Nonconformity and corrective action	**SINAI GAS** takes corrective actions to eliminate the cause of nonconformities in order to prevent recurrence. Corrective / preventive action is to be appropriate to the impact of the problems encountered.	SG-P-14	
10.3	Continual improvement	**SINAI GAS** plans and manages the processes necessary for the continual improvement of the integrated management system	SG-P-14	

4-3 Compliance with Requirements of ISO 45001:2018

Following table is a compliance matrix that clearly illustrates how the company's management system fulfils requirements of the international standard *(ISO 45001:2018)*

ISO 45001: 2018 Elements		Policy of application	Supporting Doc. code #	Remarks
4	*Context of the organization*			Title
4.1	Understanding the organization and its context	Generic context of the organization is identified, evaluated and response actions are recommended within each management review.	SG-P-16	
4.2	Understanding the needs and expectations of interested parties	Interested parties are identified. Their expectations are recognized and understood. Respond to interested parties expectations are reviewed and recommended in each management review.	SG-P-16	
4.3	Determining the scope of the OH&S management system	Scope of **Sinai Gas** is identified as **DESIGN, EXECUTION, OPERATION &MAINTENANCE OF PRESSURE REDUCTION STATIONS, INSATALLATIONS& DISTRIBUTION OF NATURAL GAS NETWORKS FOR DOMESTIC, and COMMERCIAL & INDUSTRIAL CUSTOMERS**	SG-P-16 + page 3 of this manual	
4.4	OH&S management system	Integrated management system is established on the process approach principal. Each process is identified in separate document that illustrate its inputs, outputs, risks, opportunities and KPIs. The processes interrelations are illustrated in the business process model on page 10 of this manual	SG-P-16	
5	*Leadership and workers participation*			Title
5.1	Leadership and commitment	Management Personnel are keep to provides evidence of commitment to the development and improvement of the management system	SG-QHSEM + SG-P-16	
5.2	OH&S policy	General Manager has defined and set the Company's Quality, Environmental and Safety Policy statement after recognizing and understanding the company context. Company policy is displayed at all areas of work for awareness and departmental managers are requested to xplane the policy to their assigned personnel.	SG-QHSEM page (7)	
5.3	Organizational roles, responsibilities and authorities	Organization chart is described on page 8 of this manual. It identifies functions and their interrelations within **SINAI GAS** each departmental manager maintains its own department organizational structure. **SINAI GAS** has defined and communicated these responsibilities in the form of job descriptions that are maintained by administration department.	SG-QHSEM + SG-P-16	
5.4	Participation and consultation	Safety committee is formed as per legal requirements for the purpose of consultation and participation of interested parties in OH&S issues on monthly basis.	SG-P-11	

ISO 45001: 2018 Elements		Policy of application	Supporting Doc. code #	Remarks
6	*Planning*			Title
6.1	Actions to address risks and opportunities			Title
6.1.1	General	Risk and opportunities are identified in each process when the management system documents are established first time. Risk and opportunity evaluation is performed and raised for management review on yearly basis	SG-P-15	
6.1.2	Hazard identification and assessment of OH&S risks			Title
6.1.2.1	Hazard identification	**SINAI GAS** identifies the hazards associated with its activities and services that can control and over which it can be expected to have an influence, in order to determine those, which have or can have high risk on workers.	SG-P-11	
6.1.2.2	Assessment of OH&S risks and other risks to the OH&S management system	Hazards identification and associated Risk Assessment process takes place to recognize general health and safety risks from tasks carried out in the workplace. The management of Risk is an integral part of our operations. Risks involved in all activities must be reduced to as low as reasonably practicable, recognizing that some activities will always carry a residual risk.	SG-P-11	
6.1.2.3	Identification of OH&S opportunities and other opportunities	All identified risks are evaluated and control actions are also identified. Opportunities to control or change operational methods are also thought about and tried.	SG-P-11	
6.1.3	Determination of applicable legal requirements and other requirements	The identification and provision of access to legal and other requirements to which the organization subscribes and that are directly applicable to the hazards of its activities, products, or services are identified, listed and updated periodically.	SG-P-11	
6.1.4	Planning to take action	Work hazards and associated risks are evaluated according to defined evaluation criteria. This information of significance is used as an input to the setting of OH&S objectives and targets, and therefore is continuously reviewed and updated.	SG-P-11	
6.2	OH&S objectives and planning to achieve them			Title
6.2.1	OH&S objectives	The General Manager ensures that all department managers within **SINAI GAS** has established their objectives on yearly basis. These objectives should be measurable and consistent with the QHSE policy and include the commitment to continual improvement.	SG-P-15 SG-P-11	
6.2.2	Planning actions to achieve OH&S objectives	Objectives and associated execution plans are set on accumulated program. The Quality Assurance Department is responsible for ensuring that a program is established and maintained for achieving the Quality, environmental & safety objectives and targets. The objectives and related action plan applies to all relevant levels and functions of **SINAI GAS** . The objectives' program will be amended when necessary to cover projects relating to new developments, and new or modified activities, products and services.	SG-P-15 SG-P-11	

ISO 45001: 2018 Elements		Policy of application	Supporting Doc. code #	Remarks
7	*Support*			Title
7.1	Resources	Personnel who are assigned responsibilities defined in the management system and organizational chart are deemed competent based on applicable education, training, skills and experience. Human resources are evaluated on yearly basis within management review meetings. **SINAI GAS** provides and maintains its facilities to achieve the conformity of executed works, including workspace and associated facilities; equipment, hardware and software; and supporting services.	SG-P-09 + SG-P-07	
7.2	Competence	Training need assessment is performed on annual basis. Training records are maintained to demonstrate competence of personnel and evaluation of training.	SG-P-07	
7.3	Awareness	Policy , procedures and integrated management system components are the main issues of awareness that given to personnel as newly employed. Awareness of personnel is performed via awareness sessions or displayed instructions at work areas.	SG-P-07	
7.4	Information and Communication	**SINAI GAS** has created appropriate processes to ensure communication between its various levels and functions regarding the processes of the management system and their effectiveness Internal communications are insured via meeting, memos or verbal awareness of personnel External communications are performed officially and mainly include awareness of policy and OH&S requirements to interested parties.	SG-P-11	
7.5	Documented information			Title
7.5.1	General	The Integrated management system documentation includes the QHSE manual + 16 process procedure documents + detailed work instructions for critical process + a lot of forms that are used for recording documented information. These documentation cover the integrated management system that satisfy the requirements of ISO 9001: 2015, ISO 14001: 2015, ISO 45001:2018. **SINAI GAS** QHSEMS documentation hierarchy is illustrated in page 6 of this manual	SG-QHSEM	
7.5.2	Creating and updating	Each relevant department create its related documentation. Quality manager reviews all documents before issue to maintain the integrity of the management system. General manager approves all new issues of documents as permission for implementation.	SG-P-10	
7.5.3	Control of documented information	Quality Assurance Department controls system documents and each relative technical department controls its own drawings and technical documents. Such controls include methods of issuance, deletions, amendments and distribution of documents. Records are established and maintained to provide evidence of conformity to requirements.	SG-P-10	

ISO 45001: 2018 Elements		Policy of application	Supporting Doc. code #	Remarks
8	*Operation*			Title
8.1	Operational planning and control			Title
8.1.1	General	OH&S representatives are assigned on site to supervise operational controls. Work instructions are established for each hazardous operation where needed. Normally there are no other organizations personnel work at the company premises.	SG-P-11	
8.1.2	Hierarchy of controls	Should any hazard is recognized and evaluated as high risky, control actions are taken considering the hierarchy of elimination - substitution - use of engineering controls - use of administrative controls - use of PPEs.	SG-P-11	
8.2	Management of changes	Corrective action / change form is recorded , discussed and approved before execution each change in management system or work processes to make sure that changes are performed based on planned actions.	SG-P-15 + SG-P-11	
8.3	Outsourcing	No processes are outsourced in usual. But in case of outsourced processes are performed, the company uses its internal auditors to review and verify the premises at subcontractors for insuring its safe conditions of work.	SG-P-04 + SG-P-11	
8.4	Procurement	In case of provision of hazardous products or materials, the company shall identify the needed control actions within the purchase order before submission to the supplier.	SG-P-04 + SG-P-11	
8.5	Contractors	In case of provision of products or services by a contractor, the company shall identify the needed control actions within the contract performed with the contractor. The contractor shall work under supervision of the OH&S representatives.	SG-P-04 + SG-P-03	
8.6	Emergency preparedness and response	Procedures and practices are established for preventing and responding to accidents and emergencies where they may be a high risk on safety of personnel.	SG-P-11	

ISO 45001: 2018 Elements		Policy of application	Supporting Doc. code #	Remarks
9	*Performance evaluation*			Title
9.1	Monitoring, measurement, analysis and evaluation			Title
9.1.1	General	**SINAI GAS** defines, plans and implements the measurement and monitoring activities needed to assure conformity to OH&S legal and other requirements. Such measurements and monitoring shall be put in a plan that illustrates the measurement or monitoring actions , responsibility, frequency and evaluation methods of these monitoring and measuring results are evaluated periodically.	SG-P-11	
9.1.2	Evaluation of compliance with legal requirements and other requirements	**SINAI GAS** evaluates its compliance with legal and other requirements and report evaluation results periodically for management review. Compliance status shall be maintained as documented information	SG-P-11	
9.2	Internal audit			Title
9.2.1	Internal audit objectives	**SINAI GAS** conducts internal audits to determine whether the management system conforms to the requirements of the integrated management system and has been effectively implemented and maintained.	SG-P-13	
9.2.2	Internal audit process	Qualified independent internal auditors conduct annual audits and results are reported to management.	SG-P-13	
9.3	Management review	**SINAI GAS** management team reviews the management system at least twice per year to ensure its continuing suitability, adequacy and effectiveness.	SG-P-13	
10	*Improvement*			Title
10.1	Incident, nonconformity and corrective action	Procedures and practices are established for responding to accidents and emergencies where they may be a significant impact on the safety of personnel.	SG-P-11	
10.2	Continual improvement			Title
10.2.1	Continual improvement objectives	Corrective action system is established for the purpose of improvement. Corrective actions are taken to eliminate the cause of nonconformities in order to prevent recurrence. Corrective action is to be appropriate to the impact of the problems encountered.	SG-P-14	
10.2.2	Continual improvement process	**SINAI GAS** plans and manages the processes necessary for the continual improvement of the integrated management system	SG-P-14	

SAFETY DATA SHEET

Product: SPOTLEAK 1009

SDS No. : 01931 Version : 8 Date : 2005-09-20
Cancel and replace: 2003-10-06

01 - IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

NAME OF THE PREPARATION :	SPOTLEAK 1009
RECOMMENDED USES :	Strong-smelling additive for natural gas (*)
SDS No :	01931
SUPPLIER :	ARKEMA THIOCHIMIE (*) Cours Michelet - La Défense 10 92091 PARIS LA DEFENSE CEDEX FRANCE Téléphone : 01 49 00 80 80 Télécopie : 01 49 00 83 96
Emergency telephone number :	44 1865 407 333

02 - COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL NATURE OF THE PREPARATION :	TERTIOBUTYLMERCAPTAN : 77-80 % CAS : 75-66-1 EINECS : 200-890-2 F,Xi, R11-R43 ISOPROPYLMERCAPTAN : 16-23 % CAS : 75-33-2 EINECS : 200-861-4 F,Xi,N R11 - R37-50/53 n-PROPYLMERCAPTAN : 0-4 % CAS : 107-03-9 EINECS : 203-455-5 F,Xn,N R11-R22-R36/37/38-R50
EINECS :	Conforms

03 - HAZARDS IDENTIFICATION

MOST IMPORTANT HAZARDS :	-
HEALTH EFFECTS :	May cause sensitization by skin contact Irritating to respiratory system
ENVIRONMENTAL EFFECTS :	Toxic to aquatic organisms May cause long-term adverse effects in the environment
PHYSICAL AND CHEMICAL HAZARDS :	Highly flammable Thermal decomposition giving flammable and toxic products See Section : 10 (*)
SPECIFIC HAZARDS / EC :	HIGHLY FLAMMABLE IRRITANT DANGEROUS FOR THE ENVIRONMENT Highly flammable Irritating to respiratory system May cause sensitization by skin contact Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment

04 - FIRST AID MEASURES

GENERAL ADVICE :	Take off immediately all contaminated clothing
INHALATION :	Move to fresh air Oxygen or artificial respiration if needed In case of persistent problems : Consult a doctor

SKIN CONTACT :	Wash immediately and abundantly with soap and water
EYE CONTACT :	Wash well-open eyes immediately, abundantly and thoroughly with water Consult an ophthalmologist
INGESTION :	In case of problems, consult a doctor
PROTECTION OF FIRST-AIDERS :	Confined space : risk of hypoxia If entering a saturated atmosphere, wear a self contained breathing apparatus

05 - FIRE-FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA :

Foam
Dry powder
Carbon dioxide (CO_2)

EXTINGUISHING MEDIA WHICH ARE NOT SUITABLE :

High volume water jet

SPECIFIC HAZARDS :

Highly flammable
Vapours may form explosive mixture with air
Possible re-ignition of vapours from a distance
Hazards of overpressurization in containers exposed to heat : explosion risk
Thermal decomposition giving flammable and toxic products :
Hydrogen sulphide
Oxides of sulphur
Carbon oxides

SPECIFIC METHODS :

Cool containers / tanks with water spray
Prohibit all sources of sparks and ignition - Do not smoke

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS :

Wear a self-contained breathing apparatus and protective suit
Impermeable clothing

06 - ACCIDENTAL RELEASE MEASURES

PERSONAL PROTECTION :

Evacuate non-essential staff or those not equipped with individual protection apparatus
Prohibit all sources of sparks and ignition - Do not smoke
Prohibit contact with skin and eyes and inhalation of vapours
Wear personal protective equipment
In case of leak, wear a self-contained breathing apparatus

ENVIRONMENTAL PROTECTION :

Do not release into the environment
Do not let the product enter into drains
Dam up with sand or inert earth (do not use combustible materials) (*)

METHODS FOR CLEANING UP :

-

Recovery :

Pump into an inert labelled emergency container
Absorb the remainder with an inert absorbent material

Disposal :

Destroy product by oxidation with dilute solutions of :
Hydrogen peroxide
Sodium hypochlorite
Or
Destroy the product by incineration at an approved waste disposal site

07 - HANDLING AND STORAGE

HANDLING :

Technical measures/Precautions :	Storage and handling precautions applicable to products : LIQUID HIGHLY FLAMMABLE SENSITIZER WITH VAPOURS EXPLOSIVE IN AIR DANGEROUS FOR THE ENVIRONMENT Ensure appropriate exhaust and ventilation at machinery Provide showers, eye-baths Provide water point nearby Provide self-contained breathing apparatus nearby Well ventilate empty vats and tanks before entering
Safe handling advice :	Keep well away from naked flames Avoid accumulation of static charges Prohibit sources of sparks and ignition - Do not smoke Use product only in a closed system Only use safety equipment Do not use air for transfers Open drums carefully as content may be under pressure
STORAGE :	-
Technical measures/Storage conditions :	Keep containers tightly closed in a cool, well-ventilated place Store away from heat and ignition sources Provide a catch-tank in a bunded area Provide impermeable floor Provide electrical earthing of equipment and electrical equipment usable in explosive atmospheres
Incompatible products :	Strong oxidizing agents Acids Bases Reducing agents Alkaline metals
PACKAGING MATERIALS :	-
Recommended :	Carbon steel Steel in absence of moisture Stainless steel Joints : polyethylene, silsan, polytetrafluoroethylene (PTFE)
Prohibited :	Copper Copper alloys

08 - EXPOSURE CONTROLS / PERSONAL PROTECTION

PROTECTIVE PROVISIONS :	Ensure sufficient air exchange and/or exhaust in work areas
CONTROL PARAMETERS :	-
Exposure limits :	TERTIOBUTYLMERCAPTAN : FRANCE 2004 : VME = 0.5 ppm (1.8 mg/m³) (*) USA-ACGIH 2005 : TLV-TWA = 0.5 ppm (1.8 mg/m³) (*) NETHERLAND 2005 : MAC-TGG 8 u= 0.5 ppm (1.5 mg/m3) (*) According to its composition, can be considered as : ETHYLMERCAPTAN : FRANCE 2004 : VME= 0.5 ppm (1.3 mg/m³) (*) USA-ACGIH 2005 : TLV-TWA = 0.5 ppm (1.3 mg/m³) (*) NETHERLAND 2005 : MAC-TGG 8 u= 0.5 ppm (1 mg/m3) (*)
PERSONAL PROTECTION EQUIPMENT :	-
Respiratory protection :	In case of insufficient ventilation, wear suitable respiratory equipment
Hand protection :	PVC gloves

Eye protection :	Safety glasses
Skin and body protection :	Protective clothing
Specific hygiene measures :	Prohibit contact with skin and eyes and inhalation of vapours Take off immediately all contaminated clothing

09 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE (20°C) :	Liquid
COLOUR :	Colourless
ODOUR :	Stinking
BOILING POINT/RANGE :	62 °C
MELTING POINT/RANGE :	< -10 °C
DECOMPOSITION TEMPERATURE :	425 °C < T < 450 °C
FLASH POINT :	Closed cup : -27 °C Standard : ASTM D 3278
AUTOIGNITION TEMPERATURE :	245°C (standard : NF T 60 118)
VAPOUR PRESSURE :	(15 °C) : 169 hPa (mbar) - (calculated) (38 °C) : 462 hPa (mbar)
DENSITY :	(20 °C) : 807 kg/m³ (standard :NF 12 185)
SPECIFIC GRAVITY (water = 1) :	(20°C) : 0.807
SOLUBILITY :	
WATER :	Insoluble (20°C)
Solvents :	Soluble in : alcohols, ethyl ether, hydrocarbons
PARTITION COEFFICIENT (n-octanol/water) :	n-PROPYLMERCAPTAN : log Pow = 1.7 ISOPROPYLMERCAPTAN : log Pow = 1.48
OTHER DATA :	Olfactory threshold : 0.1 ppb (approximately) Relative vapour density/air : 3 Viscosity (20 °C) : 0.570 mPa.s (cP) Cloud point : < - 30°C (Standard : NF T 60 105) Refractive index (20°C) : 1.425 (ISOPROPYLMERCAPTAN, n-PROPYLMERCAPTAN): Henry's constant (atm m3/mole) = 4.61E-3

10 - STABILITY AND REACTIVITY

CONDITIONS TO AVOID :	Keep away from heat and sources of ignition To avoid thermal decomposition, do not overheat
MATERIALS TO AVOID :	Strong oxidizing agents (violent reaction) Release of : sulphur dioxide Strong oxidizing agents (hydrogen peroxide, nitric acid, hypochlorites...) : Acids and bases Reducing agents Alkaline metals

HAZARDOUS DECOMPOSITION PRODUCTS :	Thermal decomposition giving flammable and toxic products : Hydrogen sulphide Temperatures above 425 °C : Oxides of sulphur Carbon oxides
FURTHER INFORMATION :	The product is stable at ambient temperature

11 - TOXICOLOGICAL INFORMATION

ACUTE TOXICITY : -

Inhalation :
In man :
Concentration > 0.1 ppb : headache, nausea
Vapour at high concentrations :
Cardiac rhythm problems
Difficulty in breathing
Cyanosis
Possible loss of consciousness
In animals :
Practically not harmful by inhalation
No mortality in rat at 5.3 mg/l (for 4 h / vapours)

Ingestion :
In animals :
According to its composition, can be considered as :
Slightly harmful by ingestion
TERTIOBUTYLMERCAPTAN : LD 50/ oral route/rat = 4 729 mg/kg.
ISOPROPYLMERCAPTAN : LD 50/ oral route/rat = approximately 3 160 mg/kg.
n-PROPYLMERCAPTAN : LD 50/ oral route/rat = 1 790 mg/kg.

Skin-contact :
In animals :
Practically not harmful in contact with skin
No mortality in rat at 2000 mg/kg

LOCAL EFFECTS : -

Inhalation :
In man :
Vapour at high concentrations :
Irritating to respiratory system
Risk of pulmonary oedema
In animals :
Irritating to ocular and respiratory mucous membranes

Skin-contact :
In man :
Direct contact with liquid :
Or : Exposure to vapours :
Possible irritation of skin

Eye-contact :
In man :
Exposure to vapours :
And/or direct contact with liquid :
Possible irritation of eyes
In animals :
Slightly irritating to eyes
(rabbit)

SENSITIZATION : -

Skin-contact :
TERTIOBUTYLMERCAPTAN :
In animals :
Strong skin sensitizer
(guinea-pig)

CHRONIC TOXICITY :	TERTIOBUTYLMERCAPTAN : Experimental effects on animals : (Inhalation /13 week (s)) (rat) No toxic effect directly extrapolated to humans. 196 ppm
SPECIFIC EFFECTS :	TERTIOBUTYLMERCAPTAN : GENOTOXICITY : In Vitro : Results from tests do not lead to considering the product as genotoxic Foetal development : Experimental effects on animals : (rat, mouse/inhalation) Absence of congenital malformations

12 - ECOLOGICAL INFORMATION

According to its composition :
Toxic to daphnia
Slightly bioaccumulable

- SUBSTANCE CONCERNED :	TERTIOBUTYLMERCAPTAN :
MOBILITY :	In aqueous environment : Evaporation : ½ life = 2,9 h (river) - 3,8 d (pond) (estimated) In soils and sediments : Moderate adsorption : : log Koc = 2,54 (calculated)
BIOACCUMULATION :	Slightly bioaccumulable : log Pow = 2,14 (calculated)
ECOTOXICITY :	-
AQUATIC TOXICITY :	-
Acute toxicity :	Harmful to fish : LC50, 96h (Onchorhynchus mykiss) = 34 mg/l (OECD guideline 203) Toxic to daphnia : EC(I)50, 48h = 6.7 mg/l (OECD guideline 202) Harmful to algae : IC50, 72 h, (Pseudokirchneriella subcapitata) = 13 mg/l (OECD guideline 201)
Long term toxicity :	Algae : no effect concentration, NOEC 72 h, (Pseudokirchneriella subcapitata)=6,41 mg/l
- SUBSTANCE CONCERNED :	ISOPROPYLMERCAPTAN :
MOBILITY :	In aqueous environment : Evaporation : ½ life = 2.7h (river) 32h (pond) (calculated)
PERSISTENCE/DEGRADABILITY :	-
In water :	Not readily biodegradable : 0% after 28 d (OECD guideline 301 D)
In air :	Degradation by radicals OH : ½ life =9h (calculated)
BIOACCUMULATION :	Practically not bioaccumulable : log Pow = 1.48
ECOTOXICITY :	-
AQUATIC TOXICITY :	-
Acute toxicity :	Very toxic to daphnia : EC 50, 48 h < 1 mg/l (OECD guideline 202)

- SUBSTANCE CONCERNED :	n-PROPYLMERCAPTAN :
MOBILITY :	In aqueous environment : Evaporation : ½ life = 2.7h (river) 32h (pond) (calculated) In soils and sediments : Moderate adsorption log Koc = 2,30 (calculated)
PERSISTENCE/DEGRADABILITY :	-
In water :	Readily biodegradable 94.5 % after 14d (OECD guideline 301D : Closed bottle test)
In air :	Degradation by radicals OH : ½ life =8h (calculated)
BIOACCUMULATION :	Practically not bioaccumulable : log Pow = 1.7
ECOTOXICITY :	-
AQUATIC TOXICITY :	-
Acute toxicity :	Daphnia:EC 70,48h = 0.21 mg/l (OECD guideline 202)

13 - DISPOSAL CONSIDERATIONS

DISPOSAL OF PRODUCT :	Destroy the product by oxidation with dilute solutions of : Hydrogen peroxide Sodium hypochlorite Or Destroy the product by incineration at an approved waste disposal site (in accordance with local and national regulations)

14 - TRANSPORT INFORMATION

Technical consignment name :	See Section : 2
ADR/RID :	UN Nr : 3336 Danger No. : 33 Classification code : F1 Class : 3 Packaging group : II Label(s) : 3
ADN/ADNR :	Material identification No. : 3336 Class : 3 Classification code : F1 Label(s) : 3
IMDG :	UN Nr (IMDG) : 3336 Class : 3 Packaging group : II Subsidiary risks: MP Marine Pollutant (MP) : YES Label(s) : 3+MP
IATA :	UN Nr (IATA) or ID Nr : 3336 Class : 3 Packaging group : II Subsidiary risks: - Label(s) : 3 Consult ARKEMA's safety department for any further information

ARKEMA

SAFETY DATA SHEET

15 - REGULATORY INFORMATION

EEC DIRECTIVE : -

SAFETY DATA SHEETS : D. 91/155/EEC amended by D.93/112/EEC and D. 2001/58/CE: Dangerous substances and preparations

EC CLASSIFICATION / LABELLING : -

DANGEROUS PREPARATIONS (*) : D. 1999/45/EC amended by D. 2001/60/CE
F _ HIGHLY FLAMMABLE
Xi _ IRRITANT
N _ DANGEROUS FOR THE ENVIRONMENT
R11 _ Highly flammable
R37 _ Irritating to respiratory system
R43 _ May cause sensitization by skin contact
R51/53 _ Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
S16 _ Keep away from sources of ignition - No smoking
S33 _ Take precautionary measures against static discharges
S36/37 _ Wear suitable protective clothing and gloves
S61 _ Avoid release to the environment. Refer to special instructions/Safety data sheet

HAZARDOUS COMPONENTS : TERTIOBUTYLMERCAPTAN

INVENTORIES : EINECS (EU) : conforms
TSCA (USA) : conforms
DSL (Canada) : conforms
ENCS (Japan) : conforms
AICS (Australia) : conforms
ECL (Korea) : conforms
PICCS (The Philippines) : conforms
IECSC (China) : conforms (*)

16 - OTHER INFORMATION

LIST OF RELEVANT R PHRASES : R11 _ Highly flammable
R22 _ Harmful if swallowed
R36/37/38 _ Irritating to eyes, respiratory system and skin
R37 _ Irritating to respiratory system
R43 _ May cause sensitization by skin contact
R50 _ Very toxic to aquatic organisms
R50/53 _ Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

BIBLIOGRAPHY REFERENCES : Fiche toxicologique INRS : N° 190 (ALCANETHIOLS)

FURTHER INFORMATION : WHEN USED IN FORMULATIONS, CONTACT US FOR LABELLING

This information applies to the PRODUCT AS SUCH and conforming to specifications of ARKEMA
In case of formulations or mixtures, it is necessary to ascertain that a new danger will not appear
The information contained is based on our knowledge of the product, at the date of publishing and it is given quite sincerely. However the revision of some data is in progress
Users are advised of possible additional hazards when the product is used in applications for which it was not intended. This sheet shall only be used and reproduced for prevention and security
purposes
The references to legislative, regulatory and codes of practice documents cannot be considered as exhaustive
It is the responsibility of the person receiving the product to refer to the totality of the official documents concerning the use, the possession and the handling of the product
It is also the responsibility of the handlers of the product to pass on to any subsequent persons who will come into contact with the product (usage, storage, cleaning of containers, other processes)
the totality of the information contained within this safety data sheet and necessary for safety at work, the protection of health and the protection of environment
The (*) indicate the changes made with respect to the previous version

End of document.
Number of page(s): 9