
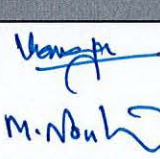
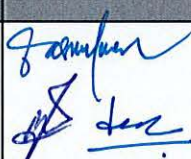
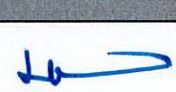
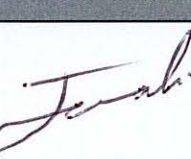
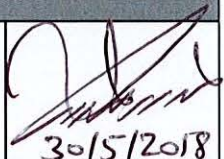





HSE INSTRUCTION FOR CONFINED SPACE ENTRY WORK

INSTRUCTION No: - IN-250-HSE-09

Approved by	Name	Jonathan Cook	
	Position	Chief HSSE Officer	
	Date	5/6/18	

Rev#	Date	Prepared by	Reviewed By			
1	24/05/2018	 M. Nouh	 Jonathan Cook	 MGM (Vinyl)	 TGM	 30/5/2018
		Sr. HSE/ Safety Officer	HSSE Support / Safety Manager	MGM (Vinyl)	TGM	MGM (SC/PE)

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Revision / Modification History

Rev#	Date	Section	Reason of Revision / Modification
0	20-Nov- 2016	All	<ul style="list-style-type: none"> Converted as Instruction and modified as per New Organization structure Change from procedure to instruction as per BT requirements Confined space permit is renamed as Confined Space Entry Certificate Template of Form "C" altered as per business requirements. Add term and definition as per new template Add section -5 Responsibilities are defined Update procedure reference documents Add sequences of signatures & break down of Form C. Add contractor safety officer responsibilities Change form Execution to Lead Executor Change Operation to Permit issuer Rename Isolation & preparation as General safety Requirements and add IN-251-SF-43 " Use of Electrical equipment inside confined space" Add Filed Operator signature in section 6 Remove Operation specialist signature, add execution supervisor signature section 5 of form C.
01	24-05- 2018	All	<ul style="list-style-type: none"> Instruction revised to integrate QAPCO PTW system with QVC PTW after merging Rename as "HSE Instruction for confine space entry work" Updated the reference list as relevant Updated the definitions as relevant Changed "Standby Person" by "Confined Space Entry Watch" Removed Safety Agent authorization from signature list for Confined Space Entry Certificate Add the requirement that all boxes in the certificate must be ticked (✓) for YES and (X) for NO Changed the distribution of the certificate copies. Updated the certificate form as required Revised safety requirements Add rescue plan requirements Update confined space entry form (F-250-HSSE-04) Add Job readiness audit Add training requirements

Distribution

Through intranet (QAPCO Staff)

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1. Purpose

These instructions lay down the requirements for authorization work inside the confined spaces to prevent danger to life OR health caused by exposure to dangerous atmosphere, and outlines safe system of work to be administrated and maintained to control all work in confined space.

The objective of this instruction is provide guidance to be exercised to identify, eliminate & minimize the hazards of confined space activities. This document is setting individual roles and responsibilities.

2. Scope

These instructions sets out the particular requirements and guidelines for asset owner, entrant, person in-charge and worker to ensure the health and safety of persons required to enter or work in a confined space.


The confined space entry certificate is applicable in all areas within the QAPCO complex for all works that need to be carried out by entering a confined space.

Confined space entry certificate is applicable to any space that meets following criteria:

- a) A place which is large enough for a person to bodily enter to perform certain jobs
- b) A place which is not designed for continuous occupancy
- c) A place which has limited or restricted means for entry or exit
- d) A place which has a potential for a hazardous or toxic atmosphere

Confined space includes, but are not limited to, tanks, vessels, silos, storage bins, hoppers, vaults, pits, manholes, tunnels, equipment housings, ductwork, pipelines and any excavation or underground pits more than 1.2 meters in depth.


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3. Definitions & Abbreviations


#	Abbreviation / Key word	Definition summary
1	Confined space	Space consider as confined space if following criteria meets: <ul style="list-style-type: none"> a A place which is large enough for a person to bodily enter to perform certain jobs. b A place which is not designed for continuous occupancy OR A place which has limited or restricted means for entry or exit. c A place which has a potential for a hazardous or toxic atmosphere. d An Excavation or underground pits more than 1.2 meters in depth.
2	Entry	Entry is defined to have occurred when any part of the entrants body breaks the plane of an opening into the confined space
3	Gas Testing	The testing of the atmosphere of the confined space using a calibrated portable direct reading instrument by QAPCO authorized person to detect the concentration of oxygen, flammable or toxic gases.
4	Authorized Gas Tester	QAPCO employee who has completed Gas Detection and Monitoring Training certified by QAPCO
5	Execution Supervisor	QAPCO Employee direct supervise Lead Executor or responsible to plan & execute the task and extensively knowledgeable about the task. He can be from QAPCO maintenance/ ESD/ Technical development / Project representative.
6	Lead Executor	Is a person who is trained and qualified for QAPCO work permit system and responsible to ensure that all conditions of the permit, agreed to with the Permit Issuer, are being fulfilled at all times throughout the job. He can be a QAPCO staff or a contractor employee.
7	Requestor	The person who requests the issuance of Work Permit for specific task at specific time at specific location.
8	Hazardous atmosphere/ Toxic Atmosphere/ Flammable Atmosphere	An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness from one or more of the following causes: <ul style="list-style-type: none"> (1) Flammable gas above 0% LEL (2) Atmospheric oxygen concentration below 19.5% or above 23.5%; (3) Airborne combustible dust at a concentration that meets or exceeds its LFL; (4) Toxic gases are present above their threshold limit value (TLV); (5) Any other atmospheric condition that is immediately dangerous to life or health.
9	Oxygen Deficient Atmosphere	An atmosphere containing less than 19.5% oxygen on a volume basis
10	Oxygen enriched atmosphere	An atmosphere containing more than 23.5% oxygen by volume.

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12	IDLH (Immediate Danger for Life and Health)	An atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere.
13	STEL (Short Term Exposure Limit)	Maximum concentration to which worker can be exposed for a period of 15 minutes without any adverse effect to health.
14	Energy Isolation	The process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; Lockout or Tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.
15	Purging/Inerting	Displacement of the atmosphere in a confined space by a non-reactive gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.
16	Engulfment	Surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance. It can be aspirated to cause death by filling or plugging the respiratory system, or that can exert enough force on the body to cause death by choking, constriction, or crushing.
17	Forced Ventilation (or mechanical ventilation)	It is intentionally induction of outside air in confined space to eliminate any hazardous atmosphere (e.g. toxic) found within the space.
18	Pinch points	Pinch points are points in and around machinery where there is a chance of a body part getting caught between a stationary and a moving part of a machine. A pinch point could include getting caught between two moving parts of a machinery or between some material and a moving part of a machinery.
19	Prohibited condition entry	Any condition in a permitted space that is not allowed by the entry certificate during the period when entry is authorized.
21	Retrieval system	The equipment (including full-body harness and rescue line)
22	Entrapment	Any space that "has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section
23	SCBA	Self-Contained Breathing Apparatus (individual Safety Equipment which can be used in dangerous atmosphere for escape or rescue purpose)
24	Initial Gas Testing	1st Gas testing performed by trained and approved authorized gas tester (AGT). This gas testing done before approval of certificate.
25	Airline (Supplied)	Air supplied by compressed air cylinders for the purpose of multiple entries into confined space.
26	Rescue Plan	A plan prepared by fire and emergency response team to create a safe system of rescue.
24	MSDS/SDS	It is a document that contains information on the potential health effects of exposure to chemicals, or other potentially dangerous

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		substances, and on safe working procedures when handling chemical products.
25	IMS	Integrated Management System
26	CHSSEO	Chief HSSE Officer
29	MGM	Manufacturing Group Manager
	TGM	Technical Group Manager
30	HOD	Head of Section
31	Job readiness audit	An audit to verify the implementation of control measures & ensuring the procedure are properly followed, is a typically conducted before final signature of permit.

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4. References documents

S. No	Document ID	Document Title
1	M-250-QSS- 01	IMS (integrated Management System) manual (<i>Previously known as SMS</i>)
2	IN-250-HSE-07	HSE Instructions for Cold work Permit Instructions
3	PR-QSS-114	Permit to work Procedure
4	PR-QSS-110	Incident Reporting and investigation Procedure
5	IN-250-HSE-03	QAPCO 12 Golden Rules at work
6	PR-QSS-127	Job safety Analysis
7	IN-250-HSE-08	HSE Instructions for Hot work Permit
8	F-250-HSSE-04	Confined Space Entry certificate

5. Responsibilities

Line Manger: The onus lies on all the line managers to ensure that this instruction is complied with and followed

Requestor: Will complete the section of 1 of confined space certificate with purpose of entry, work location, asset tag number, plant, Unit.

Based on entry propose and equipment details, area owner will identify the pre-entry hazards, State of equipment & control measures. He shall refer to Method of statement (MOS) & JSA to identify the hazards & control measures.

If any of the above conditions not met, he should consult with his superior.

Head of Section: The area owner section head will ensure that there is no conflicting activities in the area that may introduce the additional hazards and he should ensure that hazards are identified for conflicting and non- routine activities and control measures are in place and approve confined space certificate.


Senior Safety Officer will participate in JSA preparation as required and in the planning phase he will check the confined space entry requirements, validate the safe entry and authorize to perform the job.

Permit Issuer OR Asset Owner will prepare the equipment for safe entry and identify the conflict. (Detail section -2, 3 , 4 &5 of this instruction).

Its assets owner responsibility to nominate a CSE watch. CSE watch will be selected from list of trained and certified CSE watch and will be reported to area/equipment owner.

Executor with Permit Issuer will identify the CSE watch. For every confined space entry a CSE Watch shall be assigned who will be present at the entry point for all the duration.

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If **Lead Executor** using electrical equipment inside confined space, is responsible to make sure that the equipment is in healthy condition by visuals inspection. They report any faulty or damaged equipment (insulation, cable, missing plug or ELCB etc.) & replace this with the healthy equipment.

Confined Space Entry (CSE) Watch shall be trained for confined space entry and approved by QAPCO HSE, he shall be present at outside of confined space entry point and will work directly under Permit Issuer/Asset Owner supervision for the entire duration of confined space work that may include multiple activities performed by various work crew, the following points shall be covered by him at site;


- He shall ensure that all the prescribed conditions on the confined space entry certificate are fulfilled. Besides, he should know the emergency contacts and be aware of the rescue plan.
- Fully understand the hazards that may be encountered in the confined space and also the symptoms and consequences from these hazards.
- Ensure he has an effective system to maintain the-communication with the entrants.
- Maintain an accurate headcount of the personnel inside the confined space and also fill the confined space entry log sheet (Appendix-10.5).
- He will not allow any unauthorized person from entering the confined space, every entrant should handover his ID to CSE watch and receive it back once out.
- When all the entrants come out of confined space and he remains in position as CSE watch he shall place a "NO ENTRY SIGN on manhole, however If he intends to leave position as CSE watch then he must ensure the manhole is secured mechanically.
- CSE watch shall ensure that satisfactory re-gas testing performed before allowing re-entry.
- In case of any emergency within the confined space the **CSE Watch** will communicate the emergency to QAPCO Emergency team and call for help. He will not enter the confined space to rescue until help arrives on the scene.
- He will inform to emergency team, the number of people inside the confined space and possible hazardous conditions.
- He has to inform & evacuate the all entrants from the confined space in the event of an emergency general alarm.

Field Operator/Contractor safety officer (AGT) will physically check the confined space and ensure all the precautions taken are adequate, he will test the atmosphere and sign the confined space entry certificate only if the following conditions exist inside the confined space.

- Oxygen content between 19.5% to 23.5% by volume.
- Flammable gases concentration is 0% of LEL
- Carbon Monoxide (CO) < 20 ppm.
- Other toxic gases concentration is 0 ppm.

Note: Contractor safety officer is allowed to perform the gas testing outside of plant area or non-plant areas. (Incase contractor is not AGT certified QAPCO safety agent will perform the gas testing).

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- If any of the above conditions not met, he shall consult with Permit Issuer.


Any variation from acceptable limits, (19.5% - 23.5% oxygen, 0% of LEL, < 20 ppm of CO & 0 ppm for other toxics) shall be investigated and corrected prior to entering the space

Sr. Safety Agent: will advise operation/ execution and contractor for safety related issues, he should conduct site verifications and monitor HSE procedures compliances.

6. General Safety Requirements:

- 1) A confined space entry certificate is not an authority to enter inside the space, execution supervisor shall obtain work permit from respective area owner to enter inside the space.
- 2) All the process fluids should be either drained, vented and the residual energy level should be decreased to zero.
- 3) Zero energy should be demonstrated by Field operator to permit Lead Executor and Lead Executor should verify the Zero energy of confined space.
- 4) The electrical isolation/cancellation certificate shall be used for isolation of all the electrical energy sources related to the confined space.
- 5) Mechanical isolation is carried out using the piping isolation plan.
- 6) For all confined space entry in QAPCO, blinding & dropping of spool is the prescribed method of isolation.
- 7) The blinds should be inserted at the flange closest to the confined space
- 8) The equipment manhole shall be opened only when all the blinds are in place and the blind location inspected and approved on blind list.
- 9) Immediate after opening man-hole it shall be secured mechanically and No Entry sign to be posted.
- 10) If blinding/ dropping of spool cannot be performed or if there is any variation related to the procedure then the department manager should seek a variance of the procedure supported by appropriate method statement and JSA; to get the approval jointly from the HSE and executor managers.
- 11) In case of drooping of spool an end blind flange on the feed side shall be installed
- 12) Provide at least one person as CSE Watch.
- 13) Confined space entry shall not be permitted if the temperature within the space is greater than 45°C.
- 14) All the entrants should be trained on all the potential atmospheric hazards and their possible symptoms.
- 15) Any entry into a confined space with unknown atmosphere is prohibited entry conditions shall be handled through under the use of supplied air line
- 16) Whenever required, authorized entrants shall use a full body harness, with a retrieval line attached at the center of the entrant's back near shoulder.
- 17) In any case confined space manhole OR exit points shall not be obstructed.

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- 18) If lifelines are used the entrants should move about in a manner that they do not tangle and cause additional risks.
- 19) The entrants should be informed that they have to evacuate the space when instructed by the CSE Watch or in the event the experience any symptoms from the hazards.
- 20) All the personnel inside the confined space should wear required PPE specified in the permit.
- 21) The number of persons entering the confined space should be kept to a minimum.
- 22) The work duration for the personnel shall be determined by the Lead Executor and shall be enforced by the CSE Watch by providing them ample rest periods
- 23) The entry point shall be mechanically secured and "Do Not Enter" sign/tag posted at all entry points when the job is complete or work is stopped for scheduled breaks or suspended.
- 24) For process vessel entry, check that one 30-Minute Breathing Apparatus (SCBA) or Air Supply Cylinders Set has been made available outside of confined space.
- 25) New confined space entry certificates should not be issued outside normal working hours, except for emergency cases, if so it should be approved by respective plant on call duty member & safety on call.
- 26) Job readiness audit is mandatory for all confined entry activities, field operator shall ensure its compliances before issuing the work permit.
- 27) Job readiness audit shall be performed by safety agent after the certificate is approved but just before the final approval of work permits. It is the responsibility of area owner to call for job readiness audit. JRA (Job Readiness Audit) is a temporary check put in place by HSE to ensure smooth and safe transition to the new PTW system.

6.1 Gas testing:


For any required confined space entry, it is important to identify the potential hazardous gases that could be encountered. Before allowing entry in a confined space, the internal atmosphere must be tested, with a calibrated direct-reading instrument, for oxygen content (%), for flammable gases and vapors (%LEL), and for potential toxic air contaminants (ppm), by Authorized Gas Tester.

To confirm that the atmosphere inside the confined space is safe for entry, different types of gas tests required at different stages of a confined space entry task, starting from preparation and during commencing the activity inside the confined space.

A. Evaluation Gas Testing

- a) Gas testing at early stage of confined space entry preparation is required to determine what hazards are present in the space's atmosphere before allowing any entry.
- b) This test shall be done from **outside** the confined space using extendable probe.
- c) If oxygen level is measures less than 19.5 % OR more than 23.5 then no entry will be allowed even with supplied air, more actions required to bring it acceptable level.
- d) If LEL % measured is equal to or more than 0%, **no entry is allowed to the confined space**, even with air supply, operation needs to take further actions (e.g. purging) to reduce the LEL % to an acceptable level (i.e. 0%).

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- e) If Carbon monoxide (CO) is greater than 20 ppm, entry should not be allowed.
- f) Other toxic chemical levels should be 0 ppm at all times.
- g) The confined space atmosphere should be tested in three places: the top, middle and bottom.
- h) If the space of the confined space is small enough so that evaluation gas testing, which done from outside the confined space, can cover the whole atmosphere inside the confined space, then the evaluation gas testing can be considered as initial gas testing and can be recorded in the CSE Certificate.
- i) The confined space atmosphere shall be tested just before permitting first entry or re-entry after 30 where manholes have been mechanically barricaded.


B. Initial Gas Test (Verification Testing)

- a) Initial gas testing is required to give complete picture regarding the atmosphere inside the confined space, considering the configuration and size of the confined space, to be able to identify what steps must be followed and what conditions must be met to ensure that atmospheric conditions are safe for a worker to enter the space.
- b) Prior to the initial gas testing plant operations shall ensure that vessel is adequately ventilated.
- c) All mechanical ventilation and purging shall be stopped at least 15-minutes before conducting the gas test to get a representative sample of the atmosphere.
- d) Initial gas testing shall be done by AGT using calibrated direct-reading multi gas meter.
- e) AGT shall ensure that sampling tools should access all remote points of confined space if not, AGT shall enter to the confined space using air supply and test the atmosphere at all remote locations, BUDDY system to be followed. Before entry make sure rescue plan is available and FF informed.
- f) Initial gas testing results shall be recorded in the Confined Space Entry Certificate.
- g) The acceptable limits for the gases shall be; 19.5- 23.5 oxygen, 0% lower explosive limit (LEL), 00 - 20 ppm of carbon monoxide (CO) and 0 ppm for other toxic gases, any variation from normal should be investigated and corrected prior to entering the space, otherwise a suitable and sufficient control measures shall be implemented (e.g. working with Air Supply).
- h) The first entry to the vessel shall always be done by Supplied air. When the gas meter cannot access all the areas of the confined space, the person who is doing the initial gas test has to use SCBA/ supplied airline to enter the space
- i) The JSA for the confined space entry job could be reviewed based on the initial gas testing result.
- j) Initial Gas Testing is valid for 30 minutes and valid to issue confined space certificate, otherwise initial gas testing need to be repeated before allowing first entry.

C. Periodic Gas Testing

- a) Periodic gas testing is required to confirm the suitability of the atmosphere to continue work inside the confined space, also to identify any changes in the atmospheric conditions inside the confined space as a result of;
 - o Accumulation of any fumes or vapors generated from the task (e.g. welding fumes)
 - o Any fugitive material introduced to the confined space from outside.
 - o Any change in the oxygen level inside the confined space due to any reason.
 - o Any other reason not specified.
- b) Periodic gas testing frequency shall be determined by the Shift Supervisor or Area/Asset Owner during the approval of the CSE certificate, the frequency shall not exceed two hours period, if the frequency of periodic testing is deemed required to be less than one hour so continuous gas testing shall be applied.

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frequency of periodic testing is deemed required to be less than one hour so continuous gas testing shall be applied.

- c) Results of the periodic gas testing shall be recorded using the Periodic Atmosphere Gas Testing Form (Appendix 11.3)

D. Continuous Gas Testing

- In some cases, periodic gas testing is not the best practical solution to ensure the atmosphere inside the confined space is safe, and there is need for continuous gas testing.
- The confined space atmosphere shall be continuously monitored whenever work required supplied airline. (any variance to be defined in JSA and discussed with all working parties)
- Continuous gas testing will by placing calibrated direct-reading area monitor multi gas meter inside the confined space, this area monitor will continuously measure the internal atmosphere. If there is any abnormal reading it will raise audible and visual alarm to warn people inside the confined space, all entrant shall react to the alarm and evacuate the confined space immediately.
- Results of the continuous gas testing shall be recorded every hour using the Periodic Atmosphere Gas Testing Form (Appendix 11.3)

E. Gas Testing Before Re-entry

- If the work inside the confined space stopped/suspended for a period of 30 minutes and confined space left unattended, then the gas testing need to be repeated before allowing people to re-enter again inside the confined space. For example;
 - Leaving work location for launch break.
 - Stopping the work during night shift.
 - Suspended the job due to some technical issues (e.g. no spare parts)
 - Suspended the job due to another job for higher priority.
 - Any other reason not specified. Re-entry to the confined space is not allowed under any circumstances and for any reason without performing gas testing.


6.2 Personal Monitoring Inside Confined Space

- The first entrant within each working group in a particular area must be carrying a personal gas detector. Thereafter, each group must have at least a personal gas detector at all times.
- The personal multi gas meter shall not considered as a replacement for the periodic or continuous gas testing.

6.3 Electrocuting Hazards

- To minimize the risk of electrocution inside confined spaces below precautions shall be taken:
 - All lighting inside confined spaces shall be **≤24 Volt AC**.
 - Whenever possible use pneumatic equipment e.g. grinders.
 - If use of pneumatic equipment is not suited for the task or equipment not available, the use extra low voltage electrical equipment is preferable.
 - All cords or cables must be free from any defects and insulation must be in good condition.

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- In case of any damage caused during the task, stop the task and replace the damaged equipment or cable immediately.
- All equipment shall be fed through the switch board that is provided with Earth Leakage Circuit Breaker OR Ground fault circuit interrupter (ELCB/ GFCI). It must be tripped at < 30 mA.
- The ELCB/ GFCI must be inspected by QAPCO's electrical section prior to use.
- Transformers shall never be taken inside a confined spaces.
- Electrical sockets shall not be placed inside a confined spaces.
- Each electrical cable that enters a confined space through a man way shall be supported from the top of the man way to prevent damage by people entering or leaving the confined space.

6.4 Welding activities inside confined space:

- a) The use of inert gases in welding processes introduces asphyxiant gases into the confined spaces. To minimize hazards introducing by welding activities, following requirements shall be followed:
 - The confined space atmosphere shall monitored continuously for oxygen content when welding activities are carried out.
 - Consider the geometry of the confined space for specifying precautions, e.g. low points or points where an inert or toxic atmosphere might build up. In such cases require continuous extraction / ventilation to be installed and operated to prevent exposure.
 - Complete extraction of fumes escaping from deposits on confined space due to hot work and those generated from welding / burning itself is specified.
 - No compressed Gas cylinder shall be permitted inside confined space


6.5 Confined space entry in inert atmosphere

- a. Confined space entry work in inert atmosphere shall be avoided.
- b. If inert atmosphere can't be avoided, then a comprehensive Risk Assessment shall be prepared and approved by respective plant Manager.

6.6 Confined space entry Rescue Plan:

- a. A Rescue Plan is required for all CSE works, and will be provided by the Fire & Emergency Department who are the sole executors for Rescue Plans. The rescue plan will be kept at the site of the CSE for the duration of the works.
- b. The Rescue Plan represents a Safe System of work for performing a rescue from the CS and will detail:
 - The location of the CSE and scope of works to be carried out
 - Details of persons responsible for developing the plan
 - Conditions of the CSE
 - Rescue Equipment Requirements either on scene or for rescue

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- Requirements of the Plan Executor
- Roles and Responsibilities of the confined space Watch, Fire & Emergency Coordinator, Safety Agent, CCR, and Emergency Response Team (ERT).
- c. The Rescue Plan will be validated/revalidated by the Fire & Emergency Department and communicated to all workers prior to the commencement of works and at the change of each shift. The validation/revalidation will be recorded on the reverse side of the rescue plan.


6.7 Nitrogen connection isolation:

- a. All the Nitrogen connection nearest to confined space shall be identified, closed and tagged off as long as the Confined space activity is in progress, regardless of the distance. The usage of the N2 utility station shall only be allowed through a permit and approval will be required by the area head of section.

6.8 Training Requirements:

- a) CSE WATCH:
 - CSE Watch is required to pass written test & interview by HSE department to demonstrate their competency level.
 - In addition CSE Watch has to be certify on Breathing Apparatus by third party
 - An interview with a QAPCO Senior Safety Officer/Safety Department representative after the training is successfully completed. During the interview a CSE watch will be assessed for :Senior Safety Officer assesses the adequacy of:
 - i. English language understanding.
 - ii. Understanding of QAPCO procedures & standards for discharging CSE Watch duties as appropriate.
- b) ENTRANTS:
 - For QAPCO Employees - Entrant must have attended the CSE training.
 - For Contractor– Must have attended the crew worker level 2
- c) AUTHORISED GES TESTER:
 - Must have attended the CSE and authorized gas testing training course
 - Trained and certified AGT

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7. Certificate Process:

Confined space Entry Certificate divided into following sections:

1. Job Scope identification
2. Pre- Entry Hazard Identification
3. State of Equipment and Safety Precautions
4. Initial Gas testing
5. Personal Protective equipment
6. Review and approval
7. Close out

Sequence of certificate issuance signatures is as follows;

1. Requestor
2. Authorized Gas Tester (AGT) Initial Gas Test
3. Field Operator
4. Shift supervisor / area owner
5. Head Of section (Plant Operations)

Close Out:

1. Field Operator
2. Area Owner

7.1 Section-1: Job scope identification

- a Requestor will complete this section with required information such as: Location of work, plant, unit, area, equipment tag number, name and purpose of entry


7.2 Section-2 Pre- Entry Hazard Identification

- a Based on task identified on section -1 of confined space entry certificate, a risk identification part to be checked by area owner / shift supervisor. The job Lead Executor will also assist in defining and implementing of control measures to bring the risk level to low as reasonably practicable.
- b Area owner or his authorized operator to conduct a "job site inspection"
- c For **ALL** confined space entries a JSA should be performed before issuing an entry certificate as per JSA procedure.
- d Any other potential hazard to be identified in this section:

7.3 Section-3 State of Equipment & Precaution:

- a This section is checked by Area owner, they can consult & discuss with safety representative & execution supervisor for hazard identification.
- b Identify and perform the isolation whenever required.
- c After draining and venting of confined space it should be inerted to remove all the flammable and toxic materials from its atmosphere and properly ventilated to restore the oxygen level.

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- d No confined space certificate entry will be signed for issuance by the permit issuer before isolating or bypassing the relevant securities.
- e Blinding should be carried out considering the presence of toxic gases.
- f Appropriate PPE should be used for blinding especially when the pipelines had toxic gases, SCBA or airline supply respirator has to be used. Blind list should be attached with certificate.
- g Atmosphere ventilation
 - Only mechanical ventilation should be used for confined space entry, ventilation of confined spaces can be accomplished by fans, air educators or blowers.
 - The location of the ventilation equipment should be such that the confined space is always getting fresh contaminant free air and short circuiting of air is prevented.
 - The exhaust from the ventilator should be routed such that no personnel are exposed.
 - The ventilation equipment and its accessories should be bonded and grounded to prevent static charge build up.
 - The ventilation equipment, if electrically driven, should be of explosion proof type.
 - No direct hose connection is allowed for vessel ventilation.
- h If job will be performed at height/ scaffolding platform, Lead Executor should ensure that working platform is fit for purpose and certified.


7.4 Section-4 Personnel Protective Equipment:

- a PPE precautions are listed by permit issuer and Execution Supervisor (safety/Lead Executor can be consulted).
- b Permit issuer shall brief to Lead Executor about required PPEs and other precautionary measures for the task.
- c Permit Lead Executor must understand scope of work and arrange special PPEs if identified in permit form.
- d Permit Lead Executor ensure that he & his team must comply with PPEs requirement during execution of task.
- e The Permit Issuer has to check and ensures that all the precautions taken are acceptable.
- f Any other precaution to be taken but not listed shall be added in the space provided.

7.5 Section-5 Review & Approval

- a Field Operator will take all precautions and confirm/ demonstrate the isolation (Zero energy) OR security bypass and inform the CCR.
- b Field operator shall perform gas testing (refer to section 6.1)
- c Shift supervisor after agreeing on work method, identified hazards & required control measures, he shall ensure that isolation plan is applied and blind list is approved.
- d He must ensure that initial gas testing result is satisfactory and all associate documents such as JSA & isolation plan are attached certificate document.
- e Section head or his competent delegate will approve the confined space certificate ensuring that the precautions are acceptable and task does not conflict with other activities and cannot be avoided by other alternate means.

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- f Head of section must ensure that all associate documents (JSA, blind list.....) are approved.

Approval of Confined space Certificate is not authority to start the work, lead executor requires work permit to start the Job.

- g After the approval of certificate, original shall retain with area or equipment owner whereas, hard copy and associate documents should be located near the confined space entry.
- h Once permits are issued against certificate, area owner shall follow up with outdoor field operator.
- i It is the responsibility of the filed operator that approved confined space certificate shall be displayed at outside of manhole during entry.
- j Field operator should enter the issued permits numbers at back of certificate.
- k Field operator shall stop/deny Entry if the conditions are unsafe which may be danger to the life of entrants.

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7.6 -Validation of certificate:

Validity of certificate link with relevant permits. Before extending of work permits, permit issuer shall ensure that all conditions of confined space is same.

- a If work is to be carried over to another shift, the job shall be properly handed over to the shift in charge personnel. The hand over shall ensure that the new crew is aware of the job, the status of the job, and any additional information in regards to the job.

7.7 Section-7 Close out:


- a Once the job is completed and associate permits are closed, field operator shall initiate the certificate close out.
- b The field operator shall inspect the work area and confirmed that area is restored to normal and housekeeping conducted then sign the certificate (only on the hard copy) for closing.
- c Area owner / shift supervisor will be the final authority to close the certificate. Before closing the certificate, area owner/ shift supervisor shall ensure that all associate permits are closed.
- d A separate wok permit will be issued for boxing up activities after closing of CSE certificate.
- e Blind removal will be done only after boxing up all the manholes of the asset, closing of relevant work permits and in accordance with blind list attached with certificate.
- f Cancellation of energy isolations shall be done ONLY after closing confined space certificate.

No equipment to be taken in service for what so ever reason until the certificate has been finally closed by the equipment owner. Closing of the certificate in the field by the executor and field operator in the field (hard copy) does not mean that the certificate is closed and equipment can be taken into service.

8. Suspension and cancellation of Certificate:

- a If confined space entry is stopped due to a hazardous situation developed in the area, certificate approver (equipment owner) shall ensure that all tests and precautions stated on the original confined space certificates shall be repeated and confirm the satisfactory result.
- a If the job is suspended due to other job of a higher priority, confined space shall be mechanically secures and certificate to be handed over to shift supervisor.
- b If the copy of the **Permit or confined space certificate is lost during** the execution of activities, a lead executor shall immediately stop the work and approach the permit issuer to close the work permit/certificate.

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- c In case of any **incident related to activities** performing under specific confined space certificate, lead executor should stop the job immediately, inform to CCR (permit Issuer). All the permits shall be closed.
- d After the satisfactory condition of area, a new certificate will be issued.
- e If plant **Emergency Siren sounds** at any time during the job: Stop all work, entry certificate is cancelled automatically in both affected and non-affected areas. Refer to the Emergency Response Procedure and action plan for more details. Equipment/tools must be turned off and secured as quickly as possible. Job Lead Executor is to notify the permit issuer when they are at the designated assembly point.
- f If **Changes in conditions** (such as Work method, scope of work or tools and equipment during validity of the entry certificate, Permit Issuer and Job Lead Executor must review the changes and work must be stopped, If changes affect the permit/ certificate conditions then new permit/ certificate must be issued.

1. Fire & Safety Representatives must inspect the job site after a work stoppage due to emergency or incident to revalidate jobs in this site.

2. Area Operator shall immediately barricaded the area in case of any incident happen to preserve the scene for investigation purposes.

9. Certificate Distribution

- The original or the first copy will remain in the control room.
- The hard copy will be posted at the work site.
- The hard copy can be requested at any time by any QAPCO responsible person.


10. Follow Up and Records

- After closing of the certificate, the both copies (**with all attachments**) will remain with the area owner in the CCR .
- All Confined space certificates are recorded in CCR for one month

11. Appendix:

- 11.1 Confine Space Entry Certificate
- 11.2 Confined Space Entry Certificate Flow chart
- 11.3 Periodic atmosphere gas testing form.
- 11.4 Table of main chemicals and exposure limits
- 11.5 Confined space Entrant Log sheet
- 11.6 Job readiness audit (Confined Space)

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11.1 Confined Space Certificate Template (F-250-HSSE-04)

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CONFINED SPACE ENTRY CERTIFICATE

NO. **A0000**

1. JOB SCOPE IDENTIFICATION (TO BE COMPLETED BY REQUESTER)

PLANT	UNIT / AREA	ASSET TAG NO/ NAME

PURPOSE OF ENTRY:

☐ MAINTENANCE ACTIVITIES
 ☐ EXCAVATION
 ☐ OTHER (SPECIFY): _____

DETAIL OF CONFINED SPACE : _____

REQUESTER NAME: _____

SIGNATURE: _____ CONTACT NO: _____ DATE: _____ TIME: _____

2. PRE-ENTRY HAZARD IDENTIFICATION (TO BE COMPLETED BY SHIFT SUPERVISOR / ASSET / AREA OWNER)

<input type="checkbox"/> OXYGEN DEFICIENT ATMOSPHERE	<input type="checkbox"/> ENGULFMENT	<input type="checkbox"/> SLIPS / TRIPS
<input type="checkbox"/> OXYGEN ENRICH ATMOSPHERE	<input type="checkbox"/> ENTRAPMENT	<input type="checkbox"/> POOR VISIBILITY
<input type="checkbox"/> TOXIC ATMOSPHERE	<input type="checkbox"/> ENERGIZED ELECTRICAL EQUIPMENT	<input type="checkbox"/> WORK AT HEIGHT / FALLING OBJECTS
<input type="checkbox"/> FLAMMABLE ATMOSPHERE	<input type="checkbox"/> EXPOSE TO HEAT	<input type="checkbox"/> FIRE / EXPLOSION
<input type="checkbox"/> RADIOACTIVE	<input type="checkbox"/> DUST / FUMES GENERATED FROM WORK	<input type="checkbox"/> PINCH POINTS
		<input type="checkbox"/> OTHER (SPECIFY): _____

3A. STATE OF EQUIPMENT

(TO BE COMPLETED BY SHIFT SUPERVISOR / ASSET / AREA OWNER)

☐ CONFINED SPACE MECHANICALLY VENTILATED
☐ MECHANICALLY ISOLATED (BLIND LIST ATTACHED)
☐ ELECTRICAL ISOLATION DONE
☐ RADIOACTIVE SOURCE ISOLATED
☐ PHYSICAL DIS-ENGAGEMENT OF ROTARY EQUIPMENTS

3B. HAZARD CONTROL MEASURES

(TO BE COMPLETED BY SHIFT SUPERVISOR / ASSET / AREA OWNER)

<input type="checkbox"/> CONTINUOUS MECHANICAL VENTILATION REQUIRED	<input type="checkbox"/> ENTRANT TRAINED AND CERTIFIED
<input type="checkbox"/> GAS TESTING	<input type="checkbox"/> CSE WATCH QUALIFIED / CERTIFIED
<input type="checkbox"/> FREQUENT GAS TESTING REQUIRED (DURATION MIN)	<input type="checkbox"/> CSE WATCH NAME _____
<input type="checkbox"/> CONTINUOUS GAS TESTING REQUIRED	<input type="checkbox"/> ACCESS & EGRESS ARRANGEMENTS
<input type="checkbox"/> ELECTRICAL ISOLATION REQUIRED	<input type="checkbox"/> HEAT STRESS MITIGATION PLAN
<input type="checkbox"/> ADDITIONAL LIGHTS ARE REQUIRED, IF YES 24V PROVIDED	<input type="checkbox"/> COOLING OF CONFINED SPACE < 45 °C
<input type="checkbox"/> RESCUE PLAN ATTACHED	<input type="checkbox"/> JSA ATTACHED
<input type="checkbox"/> PERSONAL GAS MONITOR FOR AN ENTRANT AVAILABLE	<input type="checkbox"/> COMMUNICATION METHOD _____
<input type="checkbox"/> ZERO ENERGY CONFIRMED	<input type="checkbox"/> OTHERS (SPECIFY) _____

4. INITIAL GAS TEST (VALIDITY: 30 MINUTES): ADDITIONAL GAS TESTING SHALL BE DONE WHILE ISSUING THE PERMIT IF INITIAL GAS TEST TIME EXCEEDS 30 MINUTES

DATE & TIME	OXYGEN (O ₂)	FLAMMABLES (LEL)	HYDROGEN SULPHIDE (H ₂ S)	VCM (PPM)	OTHER TOXICS (PPM)
	%	%	PPM	PPM	PPM
DEVICE NO:	AGT NAME:		SIGN:		

5. PERSONAL PROTECTIVE EQUIPMENT (TO BE COMPLETED BY SHIFT SUPERVISOR / ASSET / AREA OWNER)

<input type="checkbox"/> SAFETY HARNESS	<input type="checkbox"/> SCBA	<input type="checkbox"/> DUST MASK
<input type="checkbox"/> LIFE LINE	<input type="checkbox"/> AIR SUPPLY WITH MASK	<input type="checkbox"/> OTHERS (SPECIFY): _____
<input type="checkbox"/> FACE SHIELD	<input type="checkbox"/> SAFETY GOGGLES	
<input type="checkbox"/> DISPOSABLE COVERALLS	<input type="checkbox"/> DOUBLE HEARING PROTECTION	

OTHER PARTICULAR PRECAUTIONS OR OBSERVATION : _____


6. REVIEW & APPROVAL

FIELD OPERATOR / CONTRACTOR SAFETY OFFICER		SHIFT SUPERVISOR / ASSET / AREA OWNER		HEAD OF SECTION	
NAME:	FILE#	NAME:	FILE#	NAME:	FILE#
SIGN:	DATE:	SIGN:	DATE:	SIGN:	DATE:

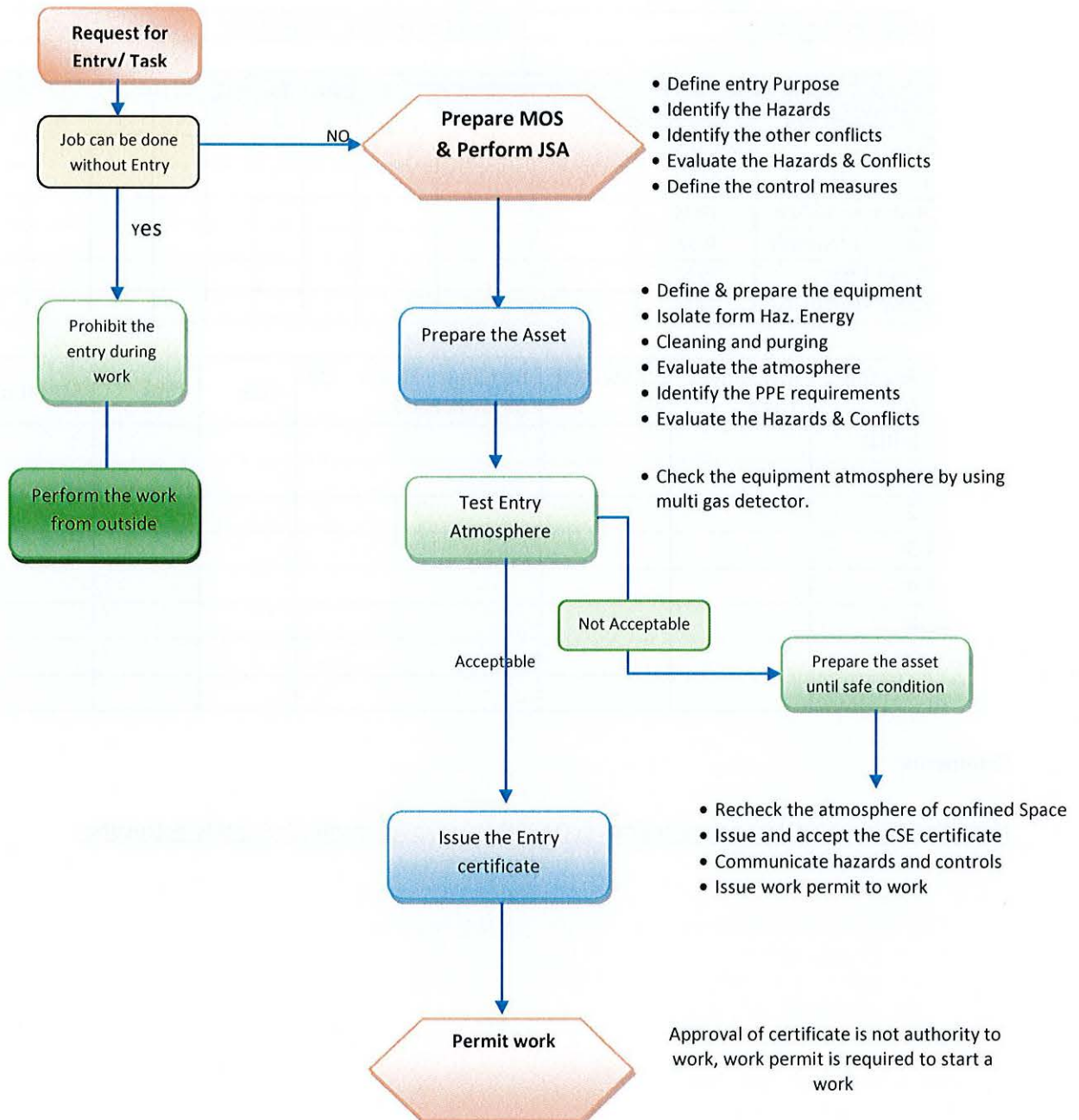
7. CLOSE OUT (ALL ASSOCIATED PERMITS ARE CLOSED BEFORE THE CLOSE OUT OF CERTIFICATE)

FIELD OPERATOR / CONTRACTOR SAFETY OFFICER		SHIFT SUPERVISOR / ASSET / AREA OWNER	
NAME:	FILE NO:	NAME:	FILE NO:
SIGN:	DATE & TIME:	SIGN:	DATE & TIME:
F-250-HSSE-04	REVISION NO: 0	DATE OF ISSUE: JAN 2018	REF # IN-250-HSE-09


ASSOCIATED WORK PERMITS		
TYPE OF PERMIT (HOT / COLD)	PERMIT NUMBER	PERMIT CLOSED (YES/NO)

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11.2 Logic Flow Chart for issuance of Confined Space Entry Certificate:



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11.3 Periodic Atmosphere Gas Testing Form:


CSE Certificate No.			Work Description & Location :							
Components	Unit	Acceptable limit for confined space	Reading Numbers & instruments Reading							
			Initial	1	2	3	4	5	6	7
Oxygen	% Volume	19.5 -23.5								
Flammable Gas	% LEL	0								
Hydrogen Sulfide	PPM	0								
Carbon Monoxide	PPM	20								
Other Toxic	PPM	0								
Other Flammable	PPM	0								

Reading No	Instrument Tag #	Calibrated on	Reading Taken By Name & File #	Date	Time	Signature
Initial						
1						
2						
3						
4						
5						
6						
7						

Comments:

Note: For TLV and PEL for toxic chemicals in QAPCO Refer to Appendix 11.3 of this instruction.

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11.3 Table of main chemical and exposure limits

S	Airborne contaminant	Exposure limits (PPM)			Flamability	Vapor Density
		OSHA* (PEL)	ACGIH** (TLV-TWA)	NIOSH*** (IDLH)	LEL-UEL %	AIR=1
1	Hydrogen Sulphide	10	01	100	4-44	1.2
2	Vinyl Chloride Monomer	1			3.6-33	2.2
3	Ethylene Dichloride	50	10	50	6.2-16	3.4
4	Carbon monoxide	50	25	1200	12.5-74	0.97
5	Benzene	1	0.5	500	1.2-7.8	2.8
6	N-Heptane	500	400	750	1.5-6.7	3.5
7	Chlorine	1	0.5	10	NA	2.4
8	Propylene	ND	500	ND	2-11.1	1.5
9	Ethylene	ND	200	ND	2.75-28.6	0.98
10	Propane	1000	E	2100	2.1-9.5	1.55
11	Acetylene	none	E	ND	2.5-100	0.91
12	Xylene	100	100	900	1.1-7	3.7
13	Isopentane	ND	E	ND	1.3-7.6	2.4
14	Butene-1	ND	ND	ND	1.6-9.3	1.93
15	Ammonia	50	25	300	15-28	0.60

PPM	Parts of vapor or gas per million parts of contaminated air by volume at 25°C and 760 mmHg
OSHA	Occupational Safety And Health Administration
ACGIH	American Conference of Governmental Industrial Hygienists
NIOSH	National Institute Of Occupational Safety And Health
PEL	Permissible exposure limit is the 8 hour time weighted average (TWA) unless otherwise
TLV	Threshold Limit Value (is the 8 hour time weighted average (TWA) unless otherwise noted)
STEL	Short Term Exposure Limit (is the 15 minute time weighted average (TWA) exposure limit).
IDLH	Immediately dangerous to life and health
E	Simple asphyxiants. The limiting factor is the available oxygen which shall be at least 19.5%
ND	Not defined

* NIOSH pocket guide to chemical hazards

** ACGIH 2006


*** NIOSH pocket guide to chemical hazards

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11.5 Job readiness audit (confined space activities)

PTW #						
S.No.	ACTIVITY	Yes	No	NA	*Action Taken (If No)	**status
1.	Job description of task and purpose of entry is clearly identified					
2.	JSA recommendations are implemented and identified in the respective Permits.					
3.	Approved blind list is attached to the certificate					
4.	Zero Energy confirmed (Electrical and Mechanical isolation)					
5.	Gas testing has been Performed by AGT and values accepted. (O ₂ , LEL, H ₂ S, VCM etc.)					
6.	Equipment for continuous/frequent gas testing is available at site. Personal portable meter is available with the entrants					
7.	All electrical equipment are equipped with ELCB/GFCI and all electrical equipment used inside have ≤ 24 Volts AC only					
8.	Internal atmosphere is safe for entry (Dust, lighting, ventilation, temperature $\leq 45^{\circ}\text{C}$)					
9.	Approved rescue plan and equipment is available and understood by all involved					
10.	Confined space is secured with clear access and egress with no obstruction. Chain lock and hard barrication is available to install in case of no entry required.					
11.	Trained and certified CSE Watch is available and aware of his roles and responsibilities					
12.	TBT is conducted and workers aware of task hazards and communication					
13.	PPE's identified in certificate and work permit are available at site					

Action taken to mitigate risk if answer is NO

** Verify the condition of equipment/ requirement after actions taken

- If the answer for any of the above check points is NO, the work shall not commence and concerned superiors shall be notified
- This check list is valid only for one shift, If the work duration exceeds more than a shift, the next incoming Area Operator shall ensure that PTW and relevant certificate requirements are complied
- The check list should be attached to the cardboard(executor) copy of cold/hot work permit and available at site

Check & confirm by:

Checked By	Name	Signature	Date/ Time
Sr. Safety agent			

Prepared by	Sr. HSSE/Safety Officer	Reviewed by	HSSE Support Manger	MGM (Vinyl)	TGM	MGM (SC/PE)	Approved By	CHSSEO
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