

BP OIL -- TOLEDO REFINERY

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TOLEDO REFINERY

RESPIRATORY PROTECTION PROGRAM (RRP)

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POLICY

All BP-Husky, Toledo Refinery employees, whose job duties may require the use of respirators, must comply with the site Respiratory Protection Program (RPP). See **Appendix B** for a list of Toledo Refinery Job Titles that are enrolled in this program. Contractors shall comply with the OSHA Respiratory Protection Standard, as well as any additional requirements contained in this program.

- 1) Engineering and administrative controls will be used first. If these methods cannot minimize worker exposure to below hazardous levels of airborne contaminants, respiratory protection will be used.
- 2) Employees with Job Titles not appearing on the **Appendix B** list are exempt from this program.
- 3) Employees who cannot wear respirators, due to medical reasons, will not perform job tasks requiring respiratory protection.

A good respirator-to-face seal must occur to effectively wear a respirator. For this reason, all employees who may be required to wear respiratory protection shall be clean-shaven. See **Appendix C** for a description of the Toledo Refinery facial hair requirements.

PURPOSE

The purpose of the Respiratory Protection Program is to protect employees from harmful exposures to airborne contaminants encountered during normal and emergency work activities, where engineering controls or administrative controls have not reduced potential exposures to acceptable levels.

RESPONSIBILITIES

A. Program Administrator

The Industrial Hygienist is responsible for the administrative control of the Respiratory Protection Program at the Toledo Refinery. These duties include:

1. Ensure that the Respiratory Protection policy is followed.
2. Approve new respirators in the refinery.
3. Periodically review and audit the Respirator Protection Program
4. Review special circumstances or situations that require variances within the Respirator Protection Program.
5. Assist with atmospheric monitoring and assessment.

B. Supervisor

1. Identify job tasks that may require respiratory protection.
2. Inform employees when respiratory protection is needed.
3. Ensure that respiratory protection equipment is available and in good working order.
4. Ensure employees receive required training and fit testing.

5. Ensure employees properly wear and use correct respirators by performing periodic random checks.
6. Insure that servicing of permanent installations is performed.
7. Determine proper respirator protection based on guidance from a hazard assessment and guidance using the "Little Chemical Book", other work procedures, or the HSSE Department.
8. Ensure that monthly respiratory protection equipment inspections are completed and recorded.
9. Ensure employees meet the facial hair requirements of the refinery.
10. Satisfy all the requirements of the respiratory program.

C. Respirator Users

1. Identify potential situations that may require respiratory protection and report them to management.
2. Use respiratory protection equipment in accordance with this program, other work procedures, and training.
3. Report any malfunction of a respirator to their immediate supervisor or the Safety Department.
4. Properly inspect, clean, and store respirators.
5. Dispose of any damaged air purifying respirator and obtain a new one.
6. Use only refinery-approved respirators and wear the correct size assigned from personal respirator fit test results.
7. Satisfy facial hair requirements of the refinery.
8. Comply with annual fit test and medical requirements.

D. Health and Safety Department Members

1. Assist Operations and Maintenance with respiratory protection selection.
2. Insure that ERT respiratory protection equipment is in good working condition.
3. Co-ordinate and manage the fire equipment/SCBA technicians with filling bottles for BP employees and cleaning of SCBA's for BP maintenance personnel.
4. Co-ordinate repair work with a certified Survivair distributor.
5. Co-ordinate IDLH standby personnel and boundaries.

DEFINITION OF TERMS

1. **Aerosol** - Particles, solid or liquid, suspended in air.
2. **Air-Line Respirator** - An atmosphere supplying respirator where the breathing air is not designed to be carried by the wearer.
3. **Air-Purifying Respirator (APR)** - A respirator that allows ambient air to be passed through an air-purifying device that will remove the contaminant(s). Air is passed through the device by the action of breathing.
4. **Assigned Protection Factor (APF)** - the level of respiratory protection provided by a properly functioning and fitted respirator. It is derived from the ratio of ambient airborne contaminant concentration to the concentration inside the face-piece.
5. **Cartridge** - A container with a filter, sorbent, or catalyst, or a combination of these, that removes specific contaminant(s) from the air passed through the container.

6. **Confined Space** - Any space large enough and so configured that an employee can enter and perform work, has limited or restricted entry or exit, and is not designed for continuous human occupancy.
7. **Contaminant** - A harmful, irritating, or nuisance airborne material.
8. **Dust** - An aerosol consisting of solid particles, Dust particle size is generally larger than fumes.
9. **Escape Respirator** - A respirator intended only for use during emergency egress from a hazardous atmosphere.
10. **Exposure Limit** - The maximum allowable concentration of a contaminant in the air to which a person may be exposed. These could be time-weighted averages, short-term limits, or ceiling limits.
11. **Filter** - A material used within respirator cartridges to remove solid or liquid aerosols from the ambient breathing air.
12. **Fit-Check** - A test performed by the respirator wearer to determine if the respirator is properly sealed on the wearer's face.
13. **Fit-Factor** - A quantitative measure of the fit of a particular respirator on a specific individual.
14. **Fume** - Solid particle aerosols formed by condensation of a gas or vapor. Fumes generally have a smaller particle size when compared to dusts.
15. **Gas** - A state of matter that can expand and contract in responses to changes in temperature and pressure, can easily disperse into other gases, and can uniformly distribute itself throughout any container.
16. **H₂S Stream** - Any vapor stream with a concentration of H₂S greater than 1000 ppm by volume, or any liquid stream with a concentration of H₂S above 1000 ppm by mass.
17. **Hazardous Atmosphere** – An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from the area or confined space), injury, or acute illness.
18. **High-Efficiency Particulate Air Filter (HEPA)** - A filter that removes 99.97% or more of aerosols having a diameter of 0.3 microns from the air.
19. **Immediately Dangerous to Life or Health (IDLH)** - An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere
20. **Inert Atmosphere** - An atmosphere that has been intentionally altered by purging with nitrogen gas in order to decrease the oxygen content.
21. **Mist** - An aerosol composed of liquid particles.
22. **Negative Pressure Respirator** - A respirator that relies on inhalation through air-purifying devices to provide breathable air to the user. From inhalation, air is evacuated from the face-piece, creating a negative pressure with respect to the atmosphere outside the face-piece.
23. **Oxygen-Deficient Atmosphere** - An atmosphere with less than 19.5% oxygen in air. Oxygen-deficient atmospheres are considered IDLH by OSHA.
24. **Oxygen-Enriched Atmosphere** – An atmosphere with greater than 23.5% oxygen in air.

25. **Poor Warning Properties** - A substance whose odor, taste, or irritation effects are not detectable or not persistent at concentrations at or below the exposure limit.
26. **Positive Pressure Respirator** - A respirator in which the pressure inside the face-piece is positive with respect to the outside atmosphere.
27. **Powered Air-Purifying Respirator (PAPR)** - An air-purifying respirator that uses a blower to force the ambient atmosphere through air-purifying cartridges to the inlet covering.
28. **Pressure Demand Respirator** - An atmosphere-supplying respirator that provides breathable air to the face-piece only when a negative pressure is created inside the face-piece by inhalation.
29. **Quantitative Fit-Test** - A fit-test that uses an instrument to accurately measure the concentration of agent inside and outside the face-piece.
30. **Sanitizer** - A substance that removes contaminants that could cause infection or disease.
31. **Self-Contained Breathing Apparatus (SCBA)** - An atmosphere-supplying respirator where the breathing air source is carried with the wearer, usually as a cylinder of compressed air.
32. **Time-Weighted Average (TWA)** - The average concentration of a contaminant in air during a specific time period.
33. **Vapor** - The gaseous phase of matter that normally exists in a liquid or solid state at room temperature.

RESPIRATOR SELECTION

- A. Only National Institute of Occupational Safety and Health (NIOSH) approved respirators shall be used at the Toledo Refinery.
- B. Respirators shall be chosen on the basis of the potential hazard. The following factors must be considered in making this selection:
 1. The identity of the substance(s) present in the work environment for which protection is needed.
 2. The physical state of the contaminant; i.e., gas, vapor, dust, mist, fume **(Appendix D)**.
 3. The permissible exposure limit (PEL) or toxicity of the substance.
 4. Exposure measurements showing the concentration likely to be encountered.
 5. The protection factor listed for the respirator type **(See Appendix E)**.
 6. The possibility of skin absorption or severe eye irritation.
 7. The possibility of oxygen deficiency.
 8. Any limitations or restrictions applicable to the types of respirators being considered which could make them unsafe in the environment involved.
 9. Odor warning properties must be sufficient to detect cartridge break-through.
 10. An Immediately Dangerous to Life and Health (IDLH) concentration.

- D. No respirator will be used that offers less protection than required for the particular conditions for which it is to be used. If desired, a respirator offering a greater protection factor than needed may be chosen.
- E. Atmospheric monitoring or knowledge of the process conditions will be utilized to determine the contaminant and approximate concentrations. Refer to **Appendix D** for the assigned protection factors (APF) for air-purifying respirators.

Negative Pressure - Air Purifying Respirators (Filter or Chemical Cartridge)

Each time a respirator is donned, the employee shall perform a positive and negative pressure test (fit check or seal test). Cartridges will be discarded after a full shift of use or if warning properties are noted such as chemical odor breakthrough or increased filter resistance while wearing the respirator.

Air purifying respirators approved for use by BP-Husky employees are:

Make	Model	Where to obtain
Survivair (Half Face Piece)	Blue 1	Safety Store
North (Half Face Piece)	RU8500	Safety Store
Survivair (Full Face Piece)	Opti-fit	Safety Store
North (Full Face Piece)	RU 6500	Safety Store
3M (Full Face Piece)	6000	Safety Store
3M (Welding Hood PAPR)	Adflo 9100	Safety Store

Refer to **Appendix D** for a listing of several respiratory hazards and the recommended cartridge. The Safety Store and/or the HSSE department can help with cartridge selection.

Positive Pressure - Air Supplying Respirators

Air-supplying respirators are either self-contained breathing apparatus (SCBA) or airline respirators.

The airline hose from the cylinder air supply shall be protected from damage, including cutting, twisting, crushing, or burning. Hose couplings shall be protected against inadvertent disconnection. Trailing airline hoses will be secured or arranged to minimize tripping hazards and to permit escape. No individual hose line shall exceed 300 feet in length or three (3) couplings.

- The air cylinder regulator shall be set to maintain a normal operating pressure of 125 psi.

- An escape air-bottle must be used when air-line supplied air respiratory protection is used.

Air supplying respirators approved for use by BP employees are:

Make	Model	Where Located
Survivair (Panther SCBA and supplied airline)	Twenty Twenty Plus (5 Straps)	HSSE Department, Mounted Boxes, Operating PODS
Survivair (Panther SCBA and supplied airline)	Twenty Twenty Plus (Head Net)	HSSE Department, Mounted Boxes, Operating PODS

The Crossfire Database program maintains an inventory of all SCBA packs. The ERT Chief maintains this database and provides guidance to HSE technician (C&W Rescue Team) for updating this database.

Annual flow testing of all SCBA's is conducted and records are maintained with the C&W HSE Technician in the Confined Space Rescue Office.

IMMEDIATELY DANGEROUS TO LIFE OR HEALTH (IDLH)

Intentionally inerting a vessel with a gas such as nitrogen will cause an oxygen-deficient atmosphere. **Note**** BP employees are not qualified to enter an inert atmosphere despite the level of respiratory protection. A qualified, trained and equipped contractor experienced in planned inert entry will perform these tasks.

All oxygen-deficient atmospheres are considered IDLH. Engineering controls will be used to bring the oxygen concentration within the range of 19.5% - 23.5% in order to allow confined space entry. Refer to **Appendix A** for IDLH requirements.

EXCLUSIVE EMPLOYEE USE OF AIR-PURIFYING RESPIRATORS

As necessary, individuals required to wear air-purifying respiratory protective equipment shall be provided such equipment for their exclusive use. (An exception to this policy may be permitted for equipment used for emergency or rescue purposes).

TRAINING AND INFORMATION

Each employee whose job may require the use of a respirator will be given detailed training annually on the proper use, care, selection and limitations of respirators. Every respirator wearer will receive instructions including demonstrations and practice on how the respirator will be worn, adjusted, and how to determine if it fits properly. As a minimum, the following items shall be covered in the training session(s):

1. The nature of the respiratory hazard (i.e., what specific chemical substances are present; what operating areas or conditions may involve potentially hazardous exposure; and what effects may result, if the respirators are not used.)
2. An explanation of why the respirator type selected is the proper one, and what factors affect selection.
3. A discussion and demonstration of how to use the respirator, i.e., how to put it on, tighten the straps, test for proper fit, etc. This will include actual donning and wearing of the respirator by each individual.
4. Instruction on the proper techniques and importance of cleaning, disinfecting, inspecting, maintaining, and storing the respirator.
5. A discussion of the capabilities and limitations of the respirator, i.e., in what environments or under what circumstances (such as oxygen deficiency) the respirator does not offer adequate protection.
6. A review of the cartridge change-out requirements.
7. The Work Practice ERT-014, details the procedure of donning an SCBA.
8. The Work Practice ERT-022, details how to replace a used cylinder.

FITTING AND TESTING

- A. Any employee required to wear a respirator shall be assured it fits properly. This shall be achieved with an annual quantitative fit test, and a positive or negative pressure fit check each time the respirator is donned. The quantitative test will be performed in the medical clinic during the employee's annual physical. Specific exercises will be performed during the quantitative fit-test. See **Appendix G** for the words that will be spoken during the test.
- B. The purpose of any respirator is to isolate the wearer from the surrounding contaminated atmosphere, by providing a leak-tight seal between the mask and the face. Respirators shall not be worn when conditions prevent an effective seal, such as from eyeglass temple bars or facial hair.

Any employee whose eyeglass temples interfere with the seal of a full face-piece respirator shall be provided with a second set of corrective lenses fitted inside the face. In accordance with the Toledo Refinery Facial Hair Requirements, facial hair that interferes with the sealing surfaces of respiratory protection equipment is prohibited for all personnel working inside the refinery and at the marine dock.

Failure to make an appropriate and effective remedy will prevent the employee from wearing the respirator.

INSPECTION AND REPAIR

A. Inspection Schedules

1. All respirators shall be inspected routinely, before and after each use, and during cleaning. Refer to ERT 022 for guidance on replacing the cylinder.
2. Equipment designed for an emergency use will be inspected after each use, during cleaning and monthly.

B. Recordkeeping

1. A record shall be kept of inspection dates and findings for all respirators maintained for emergency use. These records are maintained by the HSE Technician of the Confined Space Rescue team.

C. Inspection Considerations

Each respirator user shall be thoroughly trained on the proper inspection procedures to insure that the equipment is in good working order. Inspection shall include the following:

1. Check head straps for breaks, tears, loss of elasticity and missing or malfunctioning buckles.
2. Check face piece for dirt, cracks, tears, holes, distortion and any other signs of deterioration.
3. Check valves for dust, dirt and detergent residue. Check valves and valve seats for cracks, tears or distortion in the valve material. Also, check for missing or defective valve covers.
4. Check filter elements for correct filter(s), missing or worn gaskets, worn threads, cracks or dents in filter housing.
5. Refer to ERT 022 for servicing an SCBA.

D. Repair

All damaged respirators will be taken out of service immediately. Repair shall be done exclusively on supplied air respirators and performed by trained personnel with parts designated for the respirator. If immediate repairs cannot be made and a respirator is needed, a replacement with the same model and size shall be issued. Damaged air-purifying respirators will be discarded and replaced with a new one.

CLEANING AND DISINFECTION

Where respiratory protective equipment is used routinely, respirators shall be cleaned after each use. The cleaning procedure will include the following:

1. Remove cartridges and elastic headband.
2. Wash all respirator parts (except cartridges and elastic headbands) in a cleaner-disinfectant solution at about 120 degrees F, or use with disinfectant kit available from the Warehouse.
3. Rinse thoroughly in clean, warm water to remove all traces of detergent, cleaner, sanitizer, and disinfectant.
4. Air dry in a clean area.
5. Inspect all parts.
6. Place the respirator in a new plastic bag and seal it for storage.

STORAGE

After inspection, cleaning, and necessary repair, respirators shall be stored to protect them against dust, sunlight, heat, extreme cold, excessive moisture, and damaging chemicals. Respirators will be packed or stored with the face piece and exhalation valve resting in a position that does not damage or impair the elastomer face piece. Respirators will **NOT** be stored in places such as lockers or tool boxes unless they are in a sealed carrying case, bag, or carton.

Air supplied respirators placed at stations and work areas for emergency use shall be stored in compartments built for that purpose, be quickly accessible at all times, and clearly marked.

Each operating unit will provide proper storage facilities for the respiratory equipment normally used on the unit. The respiratory equipment used by the Fire Brigade and stored at the HSE Department will be the responsibility of the Safety Department.

WORK AREA SURVEILLANCE

Periodic air sampling shall be done to determine the continued necessity of respiratory protection and to assure that the proper respirators are being used, when necessary.

MEDICAL QUALIFICATION

No person shall be assigned to tasks requiring the use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. Each employee will complete a medical questionnaire to be evaluated by the refinery physician and/or licensed health-care professional (LHCP). The refinery physician or LHCP shall make the decision as to the fitness of the individual to wear a respirator and if an additional medical examination is necessary. The refinery physician will issue a written recommendation on the employee's ability to wear a respirator. Re-evaluation will be based on the physician's recommendation or if the employee shows signs or symptoms of difficulty in wearing a respirator. The respirator users' medical status will be reviewed annually by the examining physician.

RESPIRATOR PROGRAM EVALUATION

A periodic evaluation to determine the continued effectiveness of this respirator program will be conducted by the Safety Department. Evaluation will include:

- A. Assessment of workplace conditions to ensure that the approved respirators are still adequate for the contaminant and concentrations encountered.
- B. Evaluation of actual respirator usage; including:
 - 1. Visual inspection of employees on the job to see that respirators are worn properly and on the job(s) specified.
 - 2. Examination of respirators in storage to check for proper maintenance.
 - 3. Solicitation of wearer comments.

Any deficiencies will be recorded, assessed, and corrected. Additionally, the Respiratory Protection Policy will be modified if needed.

SUPPLIED-AIR BREATHING SYSTEMS

Toledo Refinery has developed procedures for evaluating the quality of all separate breathing air systems on a semi-annual basis. For the purpose of this section, "separate breathing air systems" include: (1) cylinders filled from a specific compressor, either in-house or by a vendor, and (2) each compressor supplying breathing air to a manifold or respirator air line.

- 1. All compressed gaseous breathing air shall meet at least the requirements of the specifications for Type 1 - Grade D breathing air. (Compressed Gas Association Commodity Specification for Air, G-7.1, 1973).
- 2. Compressed oxygen shall **NOT** be used as a breathing air source.
- 3. Breathing air containers shall be marked in accordance with American National Standard Method of Marking Portable Compressed Gas Containers to Identify the Material Contained, Z48.1-1954; Federal Specifications BB-A-1034a, June 21, 1968, Air Compressed for Breathing Purposes; or Interim Federal Specification GG-B-00675b, April 27, 1965, Breathing Apparatus, Self-Contained.
- 4. Compressors: A breathing-air type compressor capable of supplying air meeting the requirements of Type I - Grade D shall be used. Breathing-air type compressors shall be constructed and situated to avoid intake of contaminated air and shall contain in-line air-purifying sorbent beds and filters to remove potential contaminants such as CO, hydrocarbons, and oil mists. Alarms for compressor failure and overheating shall be included. The Toledo Refinery Air Compressor is located on the first floor of the HSE garage, north side of the building. A contractor employee will be responsible for filling all air bottles from the compressor.

5. The Toledo Refinery Air Compressor is located on the first floor of the HSE building garage, north side of the building. The C&W Confined Space Rescue Team HSE Technician will be responsible for filling all air bottles from this compressor. Bi-annual preventative maintenance and air testing is conducted by a third party.
6. Air-line couplings are incompatible with outlets for other gas systems, including inert gas systems and instrument air systems.
7. Work Practices, ERT 014 details how to don an SCBA.

EMERGENCY EQUIPMENT

1. Possible emergency use of respiratory protective equipment should be anticipated and be planned for.
2. SCBA's are available for operators in their operating PODs. These are for the exclusive use for respiratory protection in the emergency event of operational upset which creates toxic atmospheres due to fire and/or vapor release.
3. Periodic training sessions shall be held for those individuals most likely to use the equipment in an emergency. Training shall include demonstration and practice in putting on the respirator, testing for fit, discussion of the capabilities and imitations of the equipment, etc. The equipment manufacturer's instructions should be closely followed.

If the atmosphere involved is immediately dangerous to life or health (IDLH), standby persons must be present with suitable rescue equipment. The confined space entry permit will specify the type of equipment needed. If using an air line system, an egress bottle must also be used. The C&W Confined Space Rescue team will be informed of all confined space entries to assist in rescue if required.

VOLUNTARY RESPIRATORY PROTECTION

The Toledo Refinery allows for a voluntary Respiratory Protection Program. If an employee desires to wear a respirator when exposures are below the exposure limit in order to provide an additional level of comfort, **Appendix H** must be completed if the individual is not part of the site respiratory protection program.

Revision history

The following information documents at least the last 3 changes to this document, with all the changes listed for the last 6 months.

Date	Revised By	Changes
08/26/13	Chambers	Added 3M Adflo to approved respirator list. Removed tanks 706, 893, 91, 96, 757, 216, 217, and 704 from the Identified IDLH Tasks list. Monitoring was performed during this tasks and it was determine these tanks did not present IDLH environments when gauging. Added clarification that sampling from a non-engineered sample point on a H2S stream that has been evaluated to not be IDLH is exempt from this procedure. Added PAPR Hood/Helmet to assigned protection factor guidelines. Changed Respiratory Protection Selection Chart. Removed Reformer 1 from SCBA Locations. MOC# M2013740-001
5/28/2014	T. Flippin	Updated Appendix F – Moved SCBA's located in the H2 plant from the East to the South because the H2 plant is being transferred from the East Area to the South Area. Administrative Change only – No MOC required.
7/31/2014	T. Flippin	Updated Appendix F – Added SCBA located in the newly built BGOT RGC unit to the list. Administrative Change only – No MOC required.
9/18/2014	M. Grimes	Updated owner to Matthew Grimes. Administrative changes – Updated CoW terminology to eCoW terminology. Covered under eCoW implementation MOC #M2014707-001
03/01/17	M. Grimes	Administrative changes only. Updated Confined Space definition to meet CSE procedure definition. Updated respirator models used at Toledo Refinery. Updated Toledo Refinery Job Titles in the Respiratory Protection Program. Does not require an MOC.

Appendix A

IMMEDIATELY DANGEROUS TO LIFE OR HEALTH (IDLH)

What defines IDLH concentrations?

- **NOT ALL** work performed under supplied air is considered IDLH.
- All oxygen-deficient atmospheres (<19.5%) are classified as IDLH.
 - For confined spaces, ventilation as an engineering control shall be used to bring the oxygen concentration within 19.5% - 23.5%, unless an intentional inert atmosphere is required for process safety. Only qualified inert-trained workers may enter a confined space with an inert atmosphere.
- Atmospheres greater than 10% of the Lower Explosive Limit (LEL) are IDLH.
- Toxic atmospheres with measured values or the potential to reach its IDLH concentration such as:

Agent	IDLH
Hydrogen Sulfide (H ₂ S)	100 ppm
Sulfur Dioxide (SO ₂)	100 ppm
Benzene (C ₆ H ₆)	500 ppm
Ammonia (NH ₃)	300 ppm
Carbon Monoxide (CO)	1200 ppm
Propane (CH ₃ CH ₂ CH ₃)	2100 ppm
Methylamine (CH ₃ NH ₂)	100 ppm
Carbon Dioxide (CO ₂)	40000 ppm
Nickel Carbonyl (Ni(CO) ₄)	2 ppm
Acetic Acid (CH ₃ COOH)	50 ppm
Naphtha	1000 ppm
Sulfuric Acid (H ₂ SO ₄)	15 mg/m ³
Sodium Hydroxide (NaOH)	10 mg/m ³
Carbon Black(C w/PAH)	1750 mg/m ³
Oxygen (O ₂)	<19.5%

When do I need a rescue team at the job site?

- If the most probable outcome of a work task could expose a person to an IDLH atmosphere, then the controls shall include a minimum of 1 trained rescue personnel. For work in a confined space the Level 2 Task Risk Assessment should be used to identify and discuss these situations. A Safety team member will use the IDLH checklist to insure all provisions are met for this work.
- Other maintenance or operational tasks may need to be done in a potentially IDLH atmosphere outside of a confined space.
 1. Live Flare Work - refer to OPNS 020 for specific work protocols which shall be followed.
 2. Mechanical work, other than live flare work, that is conducted in a known IDLH atmosphere; or tasks such as, but not limited to, blanking or blinding activities that have a probable outcome of creating an IDLH atmosphere when working on equipment considered having an H₂S stream. Refer to the below table for more examples of activities that may produce IDLH atmospheres.

Identified IDLH Tasks
Live flare work (covered by OPNS 020)
Entry into a confined space with an inert atmosphere
Gauging Tanks: 001, 002, 14, 15, 65, 218, 294, 295, 648, 705, 770, 776, 777, and 892.
Breaking containment into systems having an H ₂ S Stream that has not been cleaned (i.e., not steamed or washed with Zyme-Flow type substance)
Sampling material considered an H ₂ S stream from a point other than an engineered sample station that has not been evaluated to determine that the task is below IDLH levels.
Any activities that create a response from gas detection equipment for H ₂ S greater than 100 ppm or greater than 10% LEL

- i) If it is assessed that the atmosphere could be IDLH, then the following protocols shall be used:

(1) HSSE

- (a) A BP Safety Team representative or their designate will be assigned to the task and will be at the job site for the duration of the work.
- (b) The BP Safety Team representative or their designate will establish direct communication with EOC to monitor weather conditions.
- (c) BP Safety Team representative or their designate will determine proper placement of vehicles, and equipment as it pertains to the wind direction.

- (d) BP Safety Team representative or their designate will ensure a formal rescue plan has been submitted, reviewed, and approved.
- (e) BP Safety Team representative or their designate will ensure that an equipped rescue team member is at the point of work for the duration of the task.
- (f) Complete the safety checklist for planned work in IDLH conditions (Attachment 1)

(2) Monitoring/ Detection

- (a) Monitoring equipment will be determined and provided by the BP Safety Team representative or their designate. An appropriate exclusion zone will be demarcated to protect others from possible exposure to hazardous conditions. Perimeter of exclusion zone will be continually monitored for the duration of the job.

(3) Line of Communication

- (a) All involved parties from Asset, HSSE and Maintenance will establish communication on a single radio channel.
- (b) Before work can commence, all required communication and permitting between mechanics and issuing authorities (process operators) must take place.

- 3. Operations' intervention for process emergencies; such as accessing a valve, where material has accumulated in an amount sufficient enough to cause an IDLH atmosphere can occur due to a process upset (leak, etc.).
 - i) Operational emergencies may require employees to enter a potential IDLH atmosphere. The following shall be required as a minimum:
 - (1) The Operation's person shall notify another Operation's person of the need to enter a potentially hazardous atmosphere.
 - (2) The BP Husky Refinery Emergency Response Team (ERT) shall be activated (the Operation's Team may respond to the emergency before the ERT is mobilized).
 - (3) At least one operations person shall remain outside the potentially IDLH area equipped with supplied air. The entrant shall don an SCBA before entering the potential IDLH area.
 - (4) Communication shall be established; i.e., visual, voice or hand signals to monitor the progress and status of the response.

Attachment 1

IDLH Checklist for Safety Personnel

- Has the approved rescue plan been reviewed with the rescue personnel and the work crew?
- Has the CoW Level 2 Task Risk Assessment controls been discussed with the work crew and rescue personnel?
- Are the Controls in place as outlined in the CoW Level 2 Task Risk Assessment? (i.e respiratory protection)
- Is there a minimum of one trained rescue personnel properly equipped located outside the IDLH atmosphere near the worksite?
- Is the rescue personnel equipped with a pressure demand or other positive pressure SCBA or supplied-air respirator?
- Is the appropriate retrieval equipment in place or has equivalent means for rescue been established?
- Has a line of communication been established between the employee(s) in the IDLH atmosphere and the employee(s) / rescue personnel located outside the IDLH atmosphere?
- Has the wind direction been obtained from the EOC and have the associated boundaries been established?
- Is there a gas detection device at the work site to monitor the established boundaries?

APPENDIX B**Toledo Refinery Job Titles in the Respiratory Protection Program****Asset Operations**

Operations Manager
 Operations Practices Coord.
 Ops Supt - Practices
 Reliability Coordinator
 Ops Coordinator
 Ops Shift Supervisor
 Ops Superintendent
 Compliance Coordinator
 Production Coordinator
 Shift Manager
 EOGO
 Zone E Operator
 Zone E Extraboard
 Zone F Operator
 Zone F Extraboard
 NOGO
 Zone A Operator
 Zone A Extraboard
 OM&S Day Operator
 OM&S Zone 1 Operator
 OM&S Zone 1 Extraboard
 Zone D Operator
 Zone D Extraboard
 Zone C Operator
 Zone C Extraboard
 Zone B Operator
 Zone B Extraboard
 DCC Operator
 DCC Extraboard
 Inside GO

TAR & Projects

Projects Engineer
 Project Superintendent
 Sr Project Engineer
 Sr Project Engineer Electrical
 TAR project Engineer
 TAR Superintendent
 Major Projects Const Manager
 Project Construction Manager
 Maintenance Supv - TAR Log
 HSSE Manager - Major Projects
 Major Projects Director
 Senior Projects Advisor
 Project Manager
 Project Planner
 Project Scheduler
 Project Services Supt
 Operations Comm Super
 Project Constr Supt
 Comm Lead - JA CDHT
 TAR Event Manager

Maintenance

Analyzer Engineer
 Asset Inspector
 Asset/On Stream Prg Inspector
 Asset/QA/QC/Inspector
 Corrosion/Material Inspector
 Associate Engineer Mat & Corr
 Electrical Engineer
 Electrician
 Equip Op Coke Cleaner
 Equipment Operator
 Heavy Craft Mechanic
 Heavy Craft Mechanic Trainee
 Heavy Craft Mechanic Welder
 Inspection Engineer
 Instrument Analyzer Tech
 Instrument Engineer
 Instrument Tech
 Machinist
 Machinist Specialist
 Machinist Specialist - Welder
 Machinist Welder
 Maint & Reliability Manager
 Maintenance Engineer
 Maintenance E&I Planner
 Maintenance Planner - Rotating
 Maint. Plan & Sch. Team Leader
 Maint. Optimization Supt
 Maintenance Planner
 Maintenance Reliability Manager
 Maint. Relib. And TAR Manager
 Lead Area Maint. Supervisor
 Maintenance Supt - Execution
 Maintenance Supt - Inspection
 Maintenance & Reliability Supt
 Maintenance Supt - Rotating
 Maintenance Supv - Facilities
 Maintenance Supv - Heavy Craft
 Maintenance Supv - I&E Shop
 Maintenance Supv - Field
 Fixed Equipment Superintendent
 Maintenance Supv - Rotating
 Maintenance Supv - Transp.
 Pipefitter
 Pipefitter - Welder
 Predictive Technician
 Rotating Equipment Engineer
 Extraboard Yard

HSSE

Contractor MGT Prog & HS Supt
 Emergency Response Specialist
 Environmental Specialist
 Environmental Specialist - Air
 Environmental Specialist - Projects
 Environmental Specialist - Waste
 Env. Specialist - Water/Waste
 Environmental SME
 Environmental Senior Specialist
 Sr. Environmental Specialist
 Environmental Team Leader
 HSSE Manager
 Incident Investigation Specialist
 Industrial Hygienist
 Safety Advisor
 Senior Safety Advisor
 Safety Team Leader
 USW H&S Representative
 Internal Audit EHS Manager
 Security & Crisis Mgmt Supt

PSM

PSM Engineer
 PSM Superintendent

HR

Ops Training Coordinator

Business Support

Business Unit Leader

S&OR

Entity Dir & Eng Authority Toledo

Technical

Analyzer Supervisor
 Instrument Engineer
 Instrument & Controls Supt
 Process Engineering Supt
 Process Engineer
 Project Engineer
 Process Development Engineer
 Downstream Engineer Challenger
 Energy Coordinator
 USUR Toledo FT Engineer
 Engineering Manager
 Process Engineering Manager
 Process Project Engineer
 Senior Eng - Pressure Relief System
 Senior Process Engineer
 Relief System Authority
 Technical Manager
 Principal Engineer Inspection

APPENDIX C

Facial Hair Policy

BP - Toledo Refinery

1.0 Purpose

Toledo Refinery employs engineering controls where possible to prevent the presence of air contaminants; however, there may be situations, emergency or planned, that will require personnel to use respiratory protection. Facial hair can interfere with the sealing surfaces of a respirator or impact the valve function of tight-fitting face piece respirators. This can minimize the protection factor of the equipment and the health and safety of the wearer may be threatened. The respiratory protection standard (OSHA 29 CFR 1910.134) states that “respiratory protection shall not be worn when facial hair comes between the sealing surface of the face-piece and the face or that interferes with the valve function.” This policy has been developed to clearly communicate what defines acceptable facial hair that a respirator, if required, will give the intended protection to the wearer.

2.0 Policy

The approved policy can be found on the HSSE Website.

APPENDIX D

Respirator Hazard Categories

Black Cartridge - Organic Vapors

1. Acetone
2. Alcohol
3. Aniline
4. Ethyl Mercaptan
5. Lacquer
6. Trichloroethylene
7. Hydrocarbons - General
 - a. Benzene
 - b. Toluene
 - c. Xylene
 - d. Gasoline
 - e. Kerosene
 - f. Fuel Oil
 - g. Naphtha

Green Cartridge - Ammonia/Amines

1. Anhydrous Ammonia
2. Amines (MDEA)

Yellow Cartridge - Acid Gases and Organic Vapors








1. Hydrogen Chloride
2. Hydrochloric Acid
3. Sulfur Dioxide
4. Organic Vapors (listed above)

Purple Cartridge - Dusts, Mists, Fumes

1. Asbestos
2. Catalyst
3. Calcium and Magnesium Insulation Dust
4. Silica
5. Welding Fumes
6. Soldering Fumes
7. Oil Mist
8. Acid Mists
9. Caustic Mists
10. Fiberglass Insulation

Respirator Cartridges Selection Chart

This chart is a guide to help with the selection of the correct respirator cartridge for the task or situation.

Color	Type	Description
 Black	Organic Vapors	Gasoline and other Petroleum Hydrocarbons
 Yellow	Organic Vapors/Acid Gases	Gasoline and other Petroleum Hydrocarbons and/or Acid Gases like Chlorine, Hydrogen Chloride, Sulfur Dioxide, Formaldehyde and Hydrogen Sulfide (escape only)
 Green	Ammonia or Methylamine	Amine based compounds – Ammonia and Methylamine
 Purple/Magenta	P100 High Efficiency Particulate Air (HEPA) Filter	99.97% minimum filter efficiency Oil Aerosols (such as oil mist), Asbestos Fibers, Welding Fumes, Silica, Lead Fume or Lead Dust, Bacteria, Radionuclides, Sodium Hydroxide or Caustic Total Dust
 Light Green	Multi-Contaminant	Organic Vapors, Ammonia, Methylamine, Chlorine, Hydrogen Chloride, Sulfur Dioxide, Chlorine Dioxide, Hydrogen Fluoride, Formaldehyde and Hydrogen Sulfide (escape) and Nitrogen Dioxide, and P100 particulates (HEPA)
 Black with Purple	Combination	Organic Vapors Cartridge and P100 Particulate Filter (HEPA)
 Yellow with Purple	Combination	Acid Gas Cartridge with P100 Particulate Filter (HEPA)

APPENDIX E**Assigned Protection Factor Guidelines**

Type of Protection	Assigned Protection Factor (APF)
A. Air Purifying	
1. Half-Face	10 times the PEL
2. Full-Face	50 times the PEL
3. PAPR Half-Face	50 times the PEL
4. PAPR Full-Face	1000 times the PEL
5. PAPR Hood/Helmet	25 times the PEL
B. Pressurized Air Supplying	
1. Airline System	
a. Pressure Demand (Positive Pressure) Full-Face with Escape Bottle	1000 times the PEL
2. Self-Contained Breathing Apparatus (SCBA)	10,000 times the PEL
a. Pressure Demand (Positive Pressure)	

PEL = Permissible Exposure Limit

PAPR = Powered Air-Purifying Respirator

APPENDIX F**Respiratory Protection Equipment Inventory**

The following is a list of the respiratory protection equipment at Toledo Refinery. This list includes:

1. Self-Contained Breathing Apparatus (SCBA)
2. Air-line Supplied Systems
3. Powered Air Purifying Respirators (PAPR)

1. SCBA Location**Manufacturer****NORTH**

FCC 2 #1	Survivair
FCC 2 #2	Survivair
FCC 2 #3	Survivair
FCC 2 #4	Survivair
New North Pod #1 Operator Area	Survivair
New North Pod #2 Operator Area	Survivair
New North Pod #3 Operator Area	Survivair
New North Pod #4 Operator Area	Survivair
New North Pod #5 Operator Area	Survivair
New North Pod #6 Operator Area	Survivair
Old North Pod #1 at East Exit Door	Survivair
Old North Pod #2 at East Exit Door	Survivair
Old North Pod #3 at East Exit Door	Survivair
Old North Pod #4 at East Exit Door	Survivair
Old North Pod #5 at East Exit Door	Survivair
Old North Pod #6 at East Exit Door	Survivair
Nerve 1 Pod #1	Survivair
Nerve 1 Pod #2	Survivair
Nerve 1 Pod #3	Survivair
Nerve 1 Pod #4	Survivair
Poly Plant (Outside at grade under C3 Storage Drum)	Survivair
Poly Plant (Outside at grade South of Coker Absorber)	Survivair
UNSAT GAS Plant (Pod #1)	Survivair
UNSAT GAS Plant (Pod #2)	Survivair
UNSAT GAS Plant (Pod #3)	Survivair
Crude Vac 2 (East of the Switch Rack at grade)	Survivair

WEST

EPA #1-SAT6	Survivair
EPA #2-SAT6	Survivair

1. SCBA Location

	Manufacturer
EPA #3-SAT6	Survivair
EPA #4-SAT6	Survivair
EPA #5-SAT6	Survivair
EPA #6 West of 294 Tank	Survivair
EPA #7 West of 294 Tank	Survivair
EPA # 8 South of Sulfur Pit # 1	Survivair
EPA # 9 West of Sulfur Pit # 2	Survivair
EPA # 10 – South of Inline Burner	Survivair
EPA #11- South of Benzene Unit	Survivair
EPA #12- South of Benzene Unit	Survivair
EPA # 14 West of Sulfur Pit #3	Survivair
EPA # 15 East of Sulfur Pit #3	Survivair
West Pod at South Exit Door	Survivair
West Pod at South Exit Door	Survivair
West Pod in Technician Office Area	Survivair
West Pod in Technician Office Area	Survivair
West Pod in Technician Office Area	Survivair
West Pod in Technician Office Area	Survivair
West Pod in Technician Office Area	Survivair
West Pod in Technician Office Area	Survivair
Coker Blowdown #1	Survivair
Coker Blowdown #2	Survivair
Line Air #1 (Coker 3 Penthouse)	Survivair
Line Air #2 (Coker 3 Penthouse)	Survivair
Coker #1 South side of SAT 5	Survivair
Coker #2 South side of SAT 5	Survivair
Coker #3 South side of SAT 5	Survivair
Coker #4 South side of SAT 5	Survivair
Coker 2 #1 Under penthouse deck 3	Survivair
Coker 2 # 2 Under penthouse deck 3	Survivair
Coker 3 #1 Deck below penthouse	Survivair
Coker 3 #2 Deck below penthouse	Survivair
Coker 2 Penthouse ½ Deck (#1)	Survivair
Coker 2 Penthouse ½ Deck (#2)	Survivair
Coker 2 Penthouse	Survivair
Coker 3 Penthouse (#1)	Survivair
Coker 3 Penthouse (#2)	Survivair

SOUTH

Sat 1	Survivair
South Pod	Survivair
South Pod	Survivair
South Pod	Survivair
South Pod	Survivair

1. SCBA Location

	Manufacturer
South Pod	Survivair
South Pod	Survivair
South Pod	Survivair
South Pod	Survivair
SAT Gas (Train A - #1 Sat South of DIB2 on 30 th St)	Survivair
SAT Gas (Train A - #2 Sat South of DIB2 on 30 th St)	Survivair
DHT #1 Inside Sat 4	Survivair
DHT #2 Inside Sat 4	Survivair
Train B-SE #1 Close to stop sign on 30 th St	Survivair
Train B-SE #2 Close to stop sign on 30 th St	Survivair
Train B-SW #3 Next to stairs to South POD	Survivair
Train B-SW #4 Next to stairs to South POD	Survivair
Hydrogen Plant (Life Air @ S/End of #3 @H2S Analyzer Shack)	Survivair
BGOT RGC – Top deck of cold/high pressure separator	Survivair
Hydrogen Plant (Life Air @ S/End #4 @ H2S Analyzer Shack)	Survivair
Hydrogen Plant (Life Air @ N/End #2 @ Fd. Gas comp. deck)	Survivair
Hydrogen Plant (Life Air @ N/End #1 @ Fd. Gas comp. deck)	Survivair

EAST

East Pod - #1-Top Inside	Survivair
East Pod - #2-Top Inside	Survivair
East Pod - #3-Top Inside	Survivair
East Pod - #4-Top Inside	Survivair
East Pod - #5-Top Inside	Survivair
East Pod - #6-Top Inside	Survivair
East Pod - #1-Bottom Inside	Survivair
East Pod - #2-Bottom Inside	Survivair
East Pod - #3-Bottom Inside	Survivair
East Pod - #4-Bottom Inside	Survivair
East Pod - #5-Bottom Inside	Survivair
East Pod - #6-Bottom Inside	Survivair
DHT COOL TWR	Survivair
East Pod Escape Pack	Survivair
SAT 7 Escape Pack	Survivair
Alky I (East wall inside Alky I Satellite)	Survivair
Alky II (North West door of Alky 2)	Survivair
Alky II (Inside the pump house on the North West	Survivair

1. SCBA Location**Manufacturer**

wall)

Alky III (Inside Sat 3 North wall)

Survivair

Alky III (North West Water Pump Station)

Survivair

Alky III (South West Water Pump Station)

Survivair

Life Air @ H2 PLT Furnace N/W side

Survivair

Isocracker - #2 Side (Lt. Ends Unit North - #1)

Survivair

Isocracker - #2 Side (Lt. Ends Unit South - #2)

Survivair

OM & S

Blender #1

Survivair

Blender #2

Survivair

Blender #3

Survivair

Blender #4 East Entrance

Survivair

Blender #5 Storage Shed

Survivair

WWTU (Inside sand filter building)

Survivair

WWTU (Inside control house)

Survivair

WWTU (North wall of belt press room)

Survivair

LPG Area

LPG Control House

Survivair

Cavern Area in shed

Survivair

Southwest corner of drum hill

Survivair

Southeast corner of drum hill

Survivair

West Tank Field

Aviation Fuel Rack

Survivair

West Across Tracks from 120

Survivair

Track 10

Rail Car (Inside shack)

Survivair

Rail Car (Outside between 6-7 on east side on rack)

Survivair

APPENDIX G

RAINBOW PASSAGE

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.

APPENDIX H

BP Toledo Refinery
Respiratory Protection Program
Appendix D to 1910.134 (134 (Non-Mandatory))

Information for Employees Using Respirators When Not Required

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. **BP - Toledo Refinery**, provides respirators for your own voluntary use. You need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on the use, maintenance, cleaning and care, and warnings regarding the respirator's limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

I have read and understand the requirements of selecting, using, maintaining, and storing my respirator as part of the Voluntary Respiratory Protection Program.

Name	Date
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