Compressed Air & Gas Program

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1. PURPOSE

To establish and maintain rules and practices to ensure that the hazards associated with compressed air and compressed gasses are recognized and the necessary safeguards, education and protective equipment are provided.

2. SCOPE

This program applies to all employees and contractors of Mosaic Fertilizer LLC Phosphates Business Unit facilities. The program is limited to unfired pressure vessels and containers, and excludes systems utilizing bulk ammonia, hydrogen and oxygen.

3. DEFINITIONS

3.1 Compressed Gas - A material or mixture in a container with a pressure of 40 psig at 70 degrees Fahrenheit.

3.2 Pressure Vessel - A device capable of operating at 15 psig or more and that is larger than five (5) cubic feet in volume.

3.3 psig - Pounds per square inch measured with a gauge.

3.4 Air Receiver - Container or vessel used as an air storage tank. Contains pressure gauge and drain valve to monitor the gas pressure and remove any buildup of residual water in the receiver, respectively, and a safety relief valve.

3.5 Risks: Compressed gas cylinders can be extremely hazardous when misused or abused. Compressed gas cylinders can present a variety of hazards due to their pressure and/or content. Depending on the particular gas, there is a potential for simultaneous exposure to both mechanical and chemical hazards. Without proper use and care compressed gas cylinders can explode injuring workers and destroying equipment. Cylinders can also become flying projectiles when cylinder valves are damaged or broken off. Regulators can become bullets that

tear through workers if safety precautions are not taken. Careful procedures are necessary for handling the various compressed gases, cylinders, regulators or valves used to control gas flow, and the piping used to confine gases during flow and the piping used to confine gases during flow.

4. REQUIREMENTS

4.1 General

4.1.1 Compressed Gas use and storage areas should be kept free of debris, combustible materials and excessive vegetation.

4.1.2 Tanks and cylinders should be stored in a dedicated area appropriately secured by a fence, mechanical barrier, or other means of protection from physical damage.

4.1.3 Systems utilizing ammonia, hydrogen and bulk oxygen should be designed, constructed and operated by the specific rules of OSHA, ANSI and the Compressed Gas Association.

4.1.4 “No Smoking” signs should be posted in storage areas. Smoking should be prohibited while handling flammable gases and in and around storage areas.

4.1.5 Cylinders and tanks should be clearly labeled with their contents and hazard characteristics.

4.1.6 Access to bulk storage areas should be limited to authorized personnel.

4.1.7 Dispensing valves on bulk storage tanks should be locked closed when not in use.

4.1.8 Bulk storage tanks for flammable gases should be grounded.

4.1.9 No compressed gas cylinder should be accepted for use that does not legibly identify its contents by name. If the labeling on a cylinder becomes unclear the cylinder should be marked “contents unknown” and returned to the supplier.

4.1.10 Do not rely on the color of the cylinder for identification. Color-coding is not reliable because cylinder colors may vary with supplier. Also, never rely on labels on caps because they are interchangeable.

4.2 Cylinder Safe Handling

4.2.1 Cylinders should not be dropped, struck, or permitted to strike each other violently.

4.2.2 Cylinders should not be used as rollers, anvils, supports, or for any purpose except as a gas cylinder.

4.2.3 All cylinders should be secured to prevent tipping and protected from physical damage. All pressurized gas cylinders should be stored according to manufacturer’s specifications and securely supported to prevent falling.All cylinders must be secured with a chain or strap wether in use or in storage to keep then from falling. Ropes or wires are not allowed for that.

4.2.4 Acetylene cylinder outlets should point away from the oxygen cylinder on oxy-acetylene outfits. Incompatible gases (e.g. flammables and oxidizers) should be physically separated from each other. Incompatible gases can be stored next to each other but need to be separated by a fire wall. If not fire wall is presented, then the 25 feet rule must apply. The proper storage for oxygen cylinders requires that a minimum of 25 feet is maintained between flammable gas cylinders and oxygen cylinders or the storage area be separated, at a minimum, by a firewall five (5) feet high with a fire rating of 30 minutes.

4.2.5 Cylinders with leaks that cannot be stopped by minor adjustments should be taken to an open area and should have the pressure relieved and be tagged out.

4.2.6 Oxygen should not be used as a substitute for compressed air or as a source of pressure for cleaning.

4.2.7 Oil or grease shoud not be used on or near oxygen cylinder valves, regulators, or hose connections.

4.2.8 Cylinder valves should be closed and hose pressures bled down when cylinders are not in use.

4.2.9 Cylinders should not be located beneath welding or burning operations.

4.2.10 Acetylene should not be used in excess of 15 psig.

4.2.11 Employee should not stand in front of the cylinder gauges while opening the valves. All valve covers or valve protectors must be attached when the cylinders are not in use. A permanent valve protector must protect the valve while in use or not in use.

4.2.12 Oxygen valves should be fully opened when in use.

4.2.13 Acetylene, MAPP and Propane cylinder valves should not be opened more than one and one-half (1-1/2) turns.

4.2.14 Material or objects which would interfere with the quick closing of the valve should not be placed on top of the cylinders.

4.2.15 Compressed gas cylinders should be secured in an upright position (45 degrees to 90 degrees) at all times, and secured from falling over.

4.2.16 Cylinder valve caps should be hand tightened only.

4.2.17 Cylinders should not be lifted by the protective cap. Cylinders should be lifted in a rack designed specifically for this purpose. A suitable handling device should be used to move cylinders. Manual handling and rolling should be minimized. Cylinders should be properly secured to the handling device when being moved.

4.2.18 Markings, labels, decals, tags or stencil marks on cylinders should not be removed or defaced.

4.2.19 Valves on empty cylinders should be closed.

4.2.20 Cylinder valves should be closed and regulators removed before moving cylinders.

4.2.21 Illegible, inoperative, or damaged regulators should be removed from service.

4.2.22 Before connecting a regulator to a cylinder valve, the valve should be opened slightly and closed immediately. Employees should stand to one side of the outlet, not in front of it.

4.2.23 Regulators must be in working order at all times.

4.2.24 Transferring contents from one compressed gas cylinder to another is prohibited.

4.2.25 No attempt should be made to force or adapt regulators to a cylinder valve. Only the proper regulators should be selected.

4.2.26 Employees should not open a cylinder valve unless they are familiar with the contents and should never try to identify a gas by odor.

4.2.27 In the event of fire, the cylinder valve must be closed. If burning occurs at the neck threads or safety device, employees should not attempt to extinguish the flame unless it is striking an adjacent cylinder. Keep the cylinder and surrounding area cool and saturated with water spray to prevent the fire from spreading until the gas is exhausted.

4.2.28 When using toxic or irritating gas, the valve should only be opened while the cylinderis in a working fume hood.

4.2.29 Only use wrenches or tools that are provided by the cylinder supplier to open or close a valve. Pliers should never be used to open a cylinder valve. Some regulators require washers; this should be checked before the regulator is fitted.

4.2.30 Refer to SDS for the gas being used for information regarding use and toxicity.

4.2.31 Never leave pressure in a regulator when it is not in use.

4.3 Cylinder Storage

4.3.1 Full and empty cylinders should be stored separately. Storage areas for full and empty cylinders should be clearly labeled as such. Full cylinders should be stored in groups according to the type of gas. Empty cylinders should be stored separately from full cylinders.

4.3.2 Cylinders should be visually inspected upon arrival at the facility. Cylinders should be in good condition.

4.3.3 Cylinders that are stored outdoors should not be stored directly on earthen surfaces to prevent bottom corrosion.

4.3.4 Cylinders should be stored in an upright position unless designed by the manufacturer for horizontal storage.

4.3.5 Cylinders should not be stored in locations where the ambient temperature is above 125 degrees F. Cylinders should be protected from direct sunlight and rainfall.

4.3.6 Empty cylinders should be secured to prevent tipping and protected from physical damage.

4.3.7 The protective caps should be kept on all cylinders in storage.

4.3.8 Cylinder valve caps should be hand tightened only.

4.3.9 Cylinders should not be stored near combustible materials or in unventilated areas.

4.3.10 Oxygen cylinders in storage should be separated from fuel gas cylinders or combustible materials such as oil or grease by a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour. (See engineering drawing no. STDS0013 Firewall Standard for Separation of Oxygen and Acetylene Bottles.)

4.3.11 Cylinders should be visually checked frequently by field users for dents, arc burns, hot spots, cuts, corrosion, pitting, etc. Cylinders that are found to be in poor condition should be taken to an open area, should have the pressure relieved and be tagged out.

4.3.12 Cylinder connections should be checked frequently for leaks with a leak detecting solution or soapy water.

4.3.13 Cylinders should be equipped with pressure-relief devices (e.g. fusible plugs or relief valves) or specifically designed to compensate for elevated pressures.

4.3.14 Storage areas for compressed gas cylinders must be properly labeled with signs.

4.3.15 Cylinders showing excessive signs of unusual physical damage (such as corrosion, rust, or dents) should be removed from service. Cylinders removed from service should be returned to the vendor/supplier.

4.4 Compressed Air, Air Compressors And Air Receivers.

4.4.1 At no time should compressed air be directed towards a person. Compressed air should not be used for cleaning of clothing or the body. Never use compressed gas to dust off clothing, this could cause injury to the eyes or body and create a fire hazard. Clothing can become saturated and burst into flames if touched off by an ignition source such as a spark or cigarette.

4.4.2 Compressed air used for cleaning should be a maximum of 30 psig and used with approved nozzles.

4.4.3 Air receivers and safety relief valves should be constructed, installed, and maintained in accordance with the American Society of Mechanical Engineers' Boiler and Pressure Vessel Code, Section VIII.

4.4.4 Air receivers should be equipped with:

a. A pressure gauge so located as to be readily visible.

b. One or more spring-loaded safety valves.

c. Drain valves installed at the lowest point of vessel to provide for the removal of accumulated oil and water.
d. Nameplate which must be kept clean and legible.

4.4.5 Air receivers should be installed such that all drains, hand holes, and manholes are easily accessible.
4.4.6 Air receivers should not be buried underground or located in an inaccessible place.
4.4.7 If compressed air is used for breathing sir, refer to the Respiratory Protection Procedure.
4.4.8 Inspect piping systems on a regular basis.
4.4.9 Pay attention to fittings as well as possible cracks that may have developed.
4.4.10 Examine hoses regularly for leaks, set up an inspection schedule.
4.4.11 Do not use unnecessarily long hoses.
4.4.12 Keep hoses free from kinks and away from high traffic areas.
4.4.13 Repair leaks promptly and properly.
4.4.14 Store hoses in a cool place, and protect them from hot objects, and sparks.
4.4.15 Do not use a single hose having more than one gas passage.

5. PROGRAM REVIEW / PERIODIC INSPECTIONS

5.1 Air Receivers should be visually inspected quarterly to assure that pressure and their gages are in working order, there is no accumulation of moisture and that the relief valve is operational.
5.2 Compressed Air Receivers and other unfired pressure vessels operated at 15 psig or more and that are larger than five (5) cubic feet in volume should be inspected by an inspector holding a valid National Board Commission at intervals specified by the inspector. Exceptions to this requirement are devices:
5.2.1 Five cubic feet in volume or less and capable of operating at two-hundred-fifty psig or less.
5.2.2 One and one-half cubic feet in volume or less and capable of operating at six-hundred psig or less.
5.2.3 An inside diameter of six inches or less, with no limit on pressure.
5.3 The Compressed Air & Gas Policy will be reviewed once every five years.

6. CONTRACTORS

6.1 All contractors and temporary employees should adhere to all safety and heath policies required for Mosaic employees.

7. APPENDICES

7.1 There are no appendices to this Program.

8. REFERENCES

8.1 OSHA
8.1.1 29 CFR 1910.101, Compressed Gases (general requirements)
8.1.2 29 CFR 1910.102, Acetylene
8.1.3 29 CFR 1910.103, Hydrogen
8.1.4 29 CFR 1910.104, Oxygen
8.1.5 29 CFR 1910.105, Nitrous oxide
8.1.6 29 CFR 1910.110, Storage and Handling of Liquefied Petroleum Gases
8.1.7 29 CFR 1910.111, Storage and Handling of Anhydrous Ammonia
8.1.8 29 CFR 1910.169, Air Receivers

8.1.9 29 CFR 1910.252, Welding, Cutting, and Brazing - General Requirements
8.1.10 29 CFR 1910.253, Oxygen Fuel Gas Welding and Cutting

8.2 MSHA
8.2.1 30 CFR § 56.13001 - .13029
8.2.2 30 CFR § 56.4602 - .4603
8.2.3 30 CFR § 56.16005 - .16006

8.3 ASME
8.3.1 A.S.M.E. Boiler and Pressure Vessel Code, Section VIII Edition 1968

9. REVISION LOG

Revision Log				
Rev. No.	Requested By	Approved By	Revised By	Rev. Date
0	Initial Issue for Mosaic	Safety Dept.	Safety Dept.	5/14/07
	Reformated for ISO		D. Allen	6/9/2011
1	Revisied per Peer & Facility review	Safety Dept.	M. Anan	11/22/2011
2	Review date past due	EHSS PMO	EHSS PMO	09/30/2021

Contact the Subject Matter Expert (Program Owner) for additional information on this program.