9000.03	Oxygen (Use, Care of) Standard Operating Procedure	

This procedure is for internal use only and does not enlarge an employee's civil liability in any way. The procedure should not be construed as creating a higher duty of care, in an evidentiary sense, with respect to third party civil claims against employees. A violation of this procedure, if proven, can only form the basis of a complaint by this department for non-judicial administrative action in accordance with the laws governing employee discipline.

Related Policies:
Applicable HI Statutes:

I. PURPOSE

This Standard Operating Procedure establishes operational procedures for the care and use of oxygen related equipment and media. This SOP identifies;

- procedures with use of oxygen tank, cylinders, regulators and hoses
- hazards of use of oxygen
- steps to mitigate oxygen use hazards

II. REFERENCES

- Pollak, Andrew N. (2021). Emergency Care and Transportation of the Sick and Injured (12th ed.). American Academy of Orthopedic Surgeons.
- FDA publicresources.org (2000, October). Hidden Danger: Oxygen Regulator Fires. https://youtu.be/u6tGX5nqKGo
- Miller, T. H. (n.d.). (rep.). *Special Report: Fires Involving Medical Oxygen Equipment* (TR, Vol. USFA, Ser. 107).
- NIOSH. Oxygen Regulator Flash Severely Burns One Fire Fighter-Florida, https://www.cdc.gov/niosh/fire/reports/face9823.html. Feb 5, 1999.
- Airgas Cylinder Identification General Information
- Compressed Gas Association Regulations (GCA P-1-1965)

III. APPLICABILITY

These procedures shall apply to all uniformed personnel within the Hawai'i Fire Department.

IV. POLICY

- Hawai'i Fire Department (HFD) personnel shall follow procedures established in this policy
- HFD personnel will take immediate action to correct any identified compressed gas hazards in a timely and safe manner
- HFD personnel shall inspect, handle, store and use compressed gas tanks or cylinders following procedures established in this policy (Hereafter the use of "tank(s)" shall refer to a compressed tank or cylinder regardless of size)

V. PROCEDURES

A. Changing of D-type oxygen cylinders
   1. Wash your hands and make sure that it is free from dirt, oils, and debris.

a) Minor contaminants such as skin and hair oils, hand lotions, hair care products, many lubricants, and some soap residues will burn readily in 100 percent oxygen.
b) Every effort should be made to keep the oxygen equipment clean when handling the oxygen cylinders, pressure and flow regulators, and filling connectors.

2. Inspect the cylinder, color, and markings
   a) Make sure it is oxygen and is labeled accordingly.
   b) No rust or corrosion is visible on tank or tank neck.
   c) Ensure hydrostatic testing is valid every 5 years.
3. Remove the plastic seal around the stem.
4. Hold the tank at arm's length, with one hand on the neck of the tank, and thumb on the plastic cover on the valve stem port opening. Use the other hand to pull the tab to take off the plastic port cover.
   a) The red plastic port cover is there to keep the port opening clean and usually comes with an extra O-ring in case the yoke washer is damaged or dirty.
   b) Inspect the opening to make sure it is free of dirt and debris.
   NOTE: If white plastic seal is missing around the tank stem, the tank is still usable if the port cover was in place and intact.
5. The valve stem shall not be covered or sealed with adhesive tape or petroleum-based products.
   a) These contaminants can cause combustion when mixed with pressurized oxygen.
6. The tank valve should be slightly opened and closed **SLOWLY** to clear any particles of dust, dirt, debris, or contaminants away from the valve opening.
   a) Be sure that the valve opening is facing away from you when opening the valve.
   b) Opening the valve slowly will reduce the chance of heat from compression, which is caused by the rapid rise of pressure if tank valve is opened quickly.
7. Do a visual check of the regulator.
   a) Make sure the pins are straight and free of dirt and debris. Make sure the yoke washer on the regulator is intact. If it is missing, distorted, compressed, out of shape, or dirty use the O-ring that came with the protective cap.
8. Attach the oxygen regulator to the valve stem.
   a) One side of the valve stem will have 3 holes.
   b) The large opening is where oxygen comes out.
   c) The smaller 2 holes provide stability to the regulator. Following the pin index safety system (PISS), the regulator pins will only fit into slots 2 and 5 for an oxygen tank.
9. Never use both the brass yoke washer and an O-ring together. (Notify HFD EMS Branch if you need a new yoke washer.)
10. Hand-tighten the screw bolt/wingnut so that it is aligned with the PISS slots on the valve stem.
    a) Make sure regulator is not wobbly or loose.

b) Make sure the flow dial is at zero.

11. **SLOWLY** crack the tank, then opening it fully and back half a turn.
    a) Make sure the port opening and gauge is pointing away from you or anyone else when opening the oxygen valve. Do not look at regulator gauge until the tank valve has been fully opened.
    b) Check for air leaks.
    c) Check tank pressure levels (Full tank is 2000 psi. Tanks should be changed at 500 psi.)
12. Open the flow meter and check with your hand to make sure oxygen is flowing through the regulator Christmas tree connector. Once oxygen flow is confirmed, turn off the flow meter.
13. If not to be used immediately for patient care, **SLOWLY** turn off oxygen tank valve.
14. Once the tank valve is off, **SLOWLY** open the flow meter again to purge any remaining oxygen in the regulator until the gauge returns to zero. Once purged, turn flow meter off.
    Prior to the removal of an oxygen regulator, always make sure that the oxygen tank is off and the tank has been purged.

B. Changing of K-type oxygen cylinders
1. Wash your hands and make sure that it is free from dirt, oils, and debris.
    a) Minor contaminants such as skin and hair oils, hand lotions, hair care products, many lubricants, and some soap residues will burn readily in 100 percent oxygen.
    b) Every effort should be made to keep the oxygen equipment clean when handling the oxygen cylinders, pressure and flow regulators, and filling connectors.
2. Inspect the cylinder, color and markings
    a) Make sure it is oxygen and is labeled accordingly.
    b) No rust or corrosion is visible on tank or tank neck.

Remove used K tank from ambulance

1. Make sure tank valve is closed.
2. Once the tank valve is closed, **SLOWLY** open the wall flow meter to purge any remaining oxygen in the system until the gauge returns to zero. Once system purged, turn flow meter off.
3. Using a dedicated oxygen wrench, disengage the regulator connecting hose.
4. Remove or loosen straps that anchor the oxygen tank.
5. Carefully remove the tank from the ambulance, making sure not to hit the main valve knob or valve stem. Place protective metal valve cap on tank prior to movement.
6. Move “used” K tank to compressed gas storage area and secure tank.
7. Move the “new” K tank to the ambulance.

   a) Never lift tanks by the cap.
8. The valve stem shall not be covered or sealed with adhesive tape or petroleum based products.
   a) These contaminants can cause combustion when mixed with pressurized oxygen.
9. Remove the plastic seal around the stem followed by the red plastic port cover.
10. With the assistance of another HFD personnel, carefully lift and place "new" K tank into oxygen compartment and shift into place.
11. Secure the tank with designated ratchet straps.
12. Prior to connecting the regulator connecting hose, the tank valve should be slightly opened and closed **SLOWLY** to clear any particles of dust, dirt, debris or contaminants away from the valve opening.
13. Be sure that the valve opening is facing away from you when opening the valve.
   a) Opening the valve slowly will reduce the chance of heat from compression, which is caused by the rapid rise of pressure if tank valve is opened quickly.
14. Once cleared, attach regulator connecting hose to tank using dedicated oxygen wrench, being careful not to strip threading or kinking the hose line.
15. **SLOWLY** crack the tank, then opening it fully and back half a turn.
   a) Check for air leaks.
   b) Check tank pressure levels (Full tank is 2000 psi. Tanks should be changed at 500 psi.)
16. Open the wall flow meter and check with your hand to make sure oxygen is flowing through the wall Christmas tree. Once oxygen flow is confirmed, turn off the flow meter.
17. If not to be used immediately for patient care, **SLOWLY** turn off oxygen tank valve.
18. Once the tank valve is off, **SLOWLY** open the wall flow meter again to purge any remaining oxygen in the regulator until the gauge returns to zero. Once purged, turn flow meter off.

Prior to the removal of an oxygen regulator, always make sure that the oxygen tank is off and the tank has been purged.