

**MEDICAL AIR
MAINTENANCE**

Effective date: 02/80
Revision date : 08/12

Policy:

Ensure the facility has an adequate supply of contaminant free medical air and that it is maintained, operated, and inspected according to prevailing standards. Responsible to train personnel to efficiently respond to medical air emergencies.

Prevailing Codes and Standards:

TJC EC 02.05.01 (9) and 02.05.09, NFPA 99

PM Cross Reference:

Task 3, Craft 20, Equip # MED AIR.. motor lub
Task 7, Craft 20, Equip # MED AIR.. air compressor
Task 3, Craft 4, Equip # MED AIR... motor starter

Location:

Hospital Pent House (12th floor), Hospital K-Wing (11th floor, Medical School (10th floor), WCC/ACC (east end of plant store), FWCC (room C107) and Allied Health (room G1-50)

Procedure:

I. MEDICAL AIR SUPPLY

- A. Two separate Atlas Copco screw air compressors supply medical air to hospital and K-Wing; one located on 12H and one on 11K. Systems operate independently and are cross connected from 12H to 11K.
- B. One separate duplex air compressor on 12H supplies emergency back-up medical air to the hospital and K Wing. The duplex system operates independently, and is supported by a cross connection from 11K.
- C. The Medical School medical air system is provided by one Atlas Copco Screw Air Compressor with duplex compressor as emergency backup.
- D. Women's and Children's Clinic/Ambulatory Care have stand-alone duplex medical air compressors.
- E. Allied Health building has duplex medical air manifold located in room G-150.
- F. Modifications to the medical air lines must be performed by a licensed plumber certified in medical gases.
- G. The system must be checked for cross contamination prior to releasing the system for patient use.

- H. Maintenance personnel will be trained by the supervisor to perform the following:
 - 1. How and where to monitor the medical air systems.
 - 2. Correct response for medical air emergencies.
 - 3. Who to notify during emergencies.
- I. Maintenance will follow departmental policy on infection control to prevent contamination during repairs.
- J. Medical air systems are designed to support large system demands with the reserve system starting automatically as demands exceed single compressor capacity.
- K. Maintenance will be scheduled on a priority basis.

II. **EMERGENCY BACKUP SYSTEMS**

- A. The medical air emergency backup system is provided through three separate manifolds which supply bottled medical air on demand. Each manifold operates independently.
- B. Location of the emergency backup manifolds:
 - 1. K10-52 supplies medical air to all K-Wing floors.
 - 2. K5-39 emergency backup for K5-20 and K5-43 only.
 - 3. HG-9 supplies wings A through J and outpatient clinic.
- C. Medical air back-up systems checks.
 - 1. Check manifold valve settings.
 - 2. Ensure cylinders are connected and cylinder valves open.
 - 3. Record pressure readings.
 - 4. Ensure main valve 1 and 2 are in the **ON** position and Bank A is **ON**.
 - 5. Regulator delivery pressure is set at 44 psi.

III. **INSPECTIONS**

- A. Daily Inspections
 - 1. Inspect medical air compressors at the beginning of each shift.
 - 2. Inspect medical air emergency backup systems at the beginning of each shift.
 - 3. Record the inspection in maintenance log.
- B. Preventive Maintenance Inspections
 - 1. Preventive maintenance will be scheduled.
 - 2. Maintenance Foreman will ensure preventive maintenance is performed.
 - 3. Inspection records to show current equipment status.
- C. Safety Inspections
 - 1. Medical air compressors to be inspected annually

according to High Risk Equipment Policy.

2. Documentation:
 - a. Records must reflect current equipment status.
 - b. Discrepancies found during inspections to be reported and recorded in equipment records.
 - c. Records to be kept in maintenance shop.

IV. **EMERGENCY PROCEDURES**

- A. Inform shift supervisor on all equipment emergencies.
If unavailable, go to next higher level supervisor.
- B. **HOSPITAL** - Low/loss of medical air pressure
 1. Verify emergency backup system (HG-9), K10-52, K5-39 in operation.
 2. Go to 12H.
 - a. Verify Atlas Copco running/not running. Copco system should come on line at line pressure drop to 80 psi restoring medical air to hospital and K Wing. If not running press reset switch on equipment panel.
 - b. When compressor starts, monitor operation for 30 minutes to ensure system is working properly.
 - c. Monitor compressor operation hourly
 - d. Document action in maintenance log.
 - e. Go to (3) if compressor fails to start after pressing the reset switch.
 3. Duplex Compressors Fail To Operate In Automatic
 - a. Place equipment operate switch to hand/manual mode position.
 - b. If pump fails to start, press the reset switch on equipment panel.
 - c. When pump starts, restore to automatic position and monitor operation for 30 minutes to ensure system is working properly.
 - d. Monitor compressor operation hourly.
 - e. Contact shift supervisor as needed.
 - f. Document action in maintenance log.
 - g. Go to (4) if compressor fails to start after pressing reset switch.
 4. Compressor Fails To Operate In Hand/Manual
 - a. Check Motor Control Center and perform the following:
Locate switches for medical air compressors.
 - (1) Ensure switches are "ON".
 - (2) Turn switches to "ON" if not tagged with a warning sign, perform COMPRESSORS FAIL TO OPERATE IN AUTOMATIC steps again.
 - b. If unsuccessful, contact supervisor immediately.

- c. Monitor emergency backup system HG-9, (K10-52 & K5-39) hourly and replace bottles as needed.
 - d. Document action taken in maintenance log.
- C. **K-WING** - Low/loss of medical air pressure
1. Verify emergency backup systems K10-52, HG-9 and K5-39 are in operation.
 2. Inform NICU that medical air is on emergency backup and close medical air valve X.
 3. Go to K-Wing mechanical equipment room, 11th floor
 - a. Verify Atlas Copco running/not running. If not running, go to 12H mechanical room & check backup Atlas Copco. If not running, press reset on equipment panel. Duplex system should come on line at line pressure drop to 60 psi, restoring medical air to hospital & K Wing.
 - b. When compressor starts, monitor operation for 30 minutes to ensure the system is working properly.
 - c. Monitor system pressure for 30 minutes to ensure the system is fully operational.
 - d. When the central medical air system is restored to normal, open valve X, inform NICU staff and confirm medical air pressure.
 - e. Monitor compressor operation hourly.
 - f. Document action in the maintenance log.
 - g. Go to (4) if compressor fails to start after pressing the reset switch.
 4. Duplex Pump Fails To Start In Automatic
 - a. Place the equipment operate switch to the hand/manual mode position.
 - b. If compressor fails to start, press the reset switch on the panel.
 - c. When compressor starts, this will supply medical air to K Wing and hospital from 12H cross connection. Restore to automatic position and monitor operation for 30 minutes.
 - d. Inform NICU that normal medical air is available. Don't transfer (K5-39) until requested by NICU.
 - e. Monitor K5-39 bottled gas pressure hourly until back on normal pressure.
 - f. Monitor operation hourly, and document action in the maintenance log.
 - g. If compressor fails to start in hand/manual after pressing the reset switch, go to #5.
 5. Pump Fails To Start In Hand/Manual
 - a. Check Motor Control Center and perform the following:

- i. Locate the switches for the medical air compressors
 - ii. Ensure switches are in the "ON" position.
 - iii. Turn switches to "ON" if not tagged with a warning sign, and perform COMPRESSORS FAIL TO OPERATE IN AUTOMATIC steps again.
 - b. If this operation is not successful, contact the supervisor immediately for assistance.
 - c. Monitor emergency backup system K10-52, K5-39, (HG-9) hourly, verify number of cylinders on site and initiate transport of cylinders, and replace bottles as needed.
 - d. Document action taken in maintenance log.
- D. **EMERGENCY BOTTLE BANKS** - If the emergency back up systems fail in the Hospital:
 - 1. Contact Supervisor for assistance.
 - 2. Notify Respiratory Therapy in order that they can supply regulators.
 - 3. Maintenance Personnel will deliver bottled medical air to locations in the following priority sequence as designated by Hospital Administration:
 - a. Operating Room and Recovery Room 2K and 3K
 - b. Intensive Care Units:
 - NICU (5th floor)
 - SICU (3rd floor)
 - SICU Overflow (2K Recovery)
 - BURN (1st floor)
 - MICU (7-J)
 - PICU (3-D)
 - c. Emergency Room
 - d. Pediatrics 5G and J
 - e. Patient Floors:

7K E and W	9K E and W
8K E and W	3G (Monday - Friday only)
10K E and W	6K E and W
8G	6G and J
 - f. Labor Unit
- E. **MEDICAL SCHOOL** - Low/loss of medical air pressure
 - 1. Go to Medical School 10th floor equipment room
 - a. Verify Atlas Copco Running/Not Running. If not running, check duplex system. Should come on line at pressure drop to 60 psi restoring medical air to school. If not running, check that equipment operate switches in automatic mode position.
 - b. If compressors are not running, press the reset switch on the panel.

- c. When compressors start, monitor operation for 15 minutes to ensure the system is working properly.
 - d. Monitor compressor operation hourly
 - e. Document action in the maintenance log.
 - f. Go to (7) if compressors fail to start after pressing the reset switch.
- 2. Pumps Fail To Start In Automatic
 - a. Place the operate switch in the hand/manual position.
 - b. If compressors fail to start, press the reset switch on the panel.
 - c. When the compressor starts, restore to automatic position and monitor operation for 15 minutes to ensure it is working properly.
 - d. Monitor compressor operation hourly.
 - e. Document action in the maintenance log.
 - f. Go to (8) if compressors fail to start in hand/manual after pressing the reset switch.
- 3. Pumps Fail To Start In Hand/Manual
 - a. Check Motor Control Center and perform the following:
 - i. Locate the switches for the medical air compressors.
 - ii. Ensure switches are in the "ON" position.
 - iii. Turn switches to "ON" IF NOT TAGGED WITH A WARNING SIGN, and perform COMPRESSORS FAIL TO OPERATE IN AUTOMATIC steps again.
 - b. If this operation is not successful, contact the supervisor for assistance.
 - c. Deliver bottled medical air to medical school locations on request.
 - d. Document action taken in maintenance log.

V. Emergency Backup System for Ambulatory Care/Women's & Children's Clinic

- A. The medical air emergency backup is provided through a separate manifold which supplies bottled medical air on demand.
- B. Location of the backup system is outside the LSUHSC warehouse at the east end by Accounting Services.
- C. Medical air backup system check:
 - 1. Check manifold valve setting.
 - 2. Ensure cylinders are connected and cylinder valves open.
 - 3. Record pressure readings.
 - 4. Regulator delivery pressure is set at 44 psi.

- VI. **Emergency Procedures for Ambulatory Care/Women's & Children's Clinic**
- A. Inform R.N. Director of Outpatient Clinics of emergency. If unavailable, inform Assistant Hospital Administrator for outpatient departments.
 - B. Verify emergency backup system at east end of warehouse is in operation.
 - C. Follow start-up procedures as described in IV.B.2, IV.B.3, and IV.B.4. If unsuccessful, contact supervisor immediately.
 - E. Continue to monitor the backup system at warehouse and replace bottles as necessary.
 - F. Document action taken in maintenance log.
- VII. **Emergency Bottle Bank failure Ambulatory Care/Women's & Children's Clinic**
- A. Contact supervisor.
 - B. Notify RN Director of outpatient Clinics.
 - C. Maintenance personnel will deliver bottled medical air to locations as necessary.
- VIII. **Emergency Backup System for Cancer Center**
- A. The medical air emergency backup system is provided through a separate manifold which supplies bottled medical air on demand.
 - B. Location of the backup system is room C-107.
 - C. Medical air backup system check:
 - 1. Check manifold valve setting.
 - 2. Ensure cylinders are connected and cylinder valves open.
 - 3. Record pressure readings.
 - 4. Regular delivery pressure is set at 52 PSI.
- IX. **Emergency Procedures for Cancer Center**
- A. Inform the Director of Feist-Weiller Cancer Center. If unavailable, inform Director of Oncology Services.
 - B. Verify emergency backup system in room C-107 is in operation.
 - C. Follow start-up procedures as described in IV.B.2, IV.B.3 and IV.B.4. If unsuccessful, contact supervisor immediately.
 - D. Continue to monitor the back up system in room C-107 and replace bottles as necessary.
 - E. Document action taken in maintenance log.

X. Emergency Bottle Bank Failure Cancer Center

- A. Contact supervisor.
- B. Notify Director of Feist-Weiller Cancer Center.
- C. Notify Director of Oncology Services.
- D. Maintenance personnel will deliver bottled medical air to location as necessary.

XI. Emergency Procedures for Allied Health Building and Bottle Bank Failure - Allied Health

- A. Inform Dean of Allied Health Professions
- B. Verify emergency backup system in room G1-50 is in operation
- C. Replace any empty cylinders and verify the auto transfer manifold is functioning properly.
- D. Document action in maintenance log.
- E. Notify Dean that system is operating normally.

MEDICAL AIR MANIFOLD
DAILY INSPECTION

LOCATION: _____

Inspection			Inspector Name	Pressure		Valve Position	
Date mm/dd/yr	Time	Daily or Change D/C		System PSI	Manifold PSI	Manifold ON/OFF	LINE ON/OFF