Bath Township Fire Department			Standard Operating Guideline	
Section **Equipment**	**Referral No.** **E-18**	**Subject:** **Positive Pressure Fans**	**Date Issued** **4/07**	**Date Revised** **4/08**

Purpose:

- To provide guidelines for use of positive pressure ventilation during fire ground operations.

Scope:

- This Standard Operating Guideline shall apply to all personnel.

Responsibilities:

- Officer
  - All officers will ensure that any personnel operating the positive pressure fans are properly trained and perform operations in a safe manner.
- Personnel
  - All personnel have the responsibility of wearing proper safety equipment and operating the positive pressure fans in a safe manner.
  - All personnel are responsible for maintaining the positive pressure fans in a ready state through daily/weekly checks.
  - All personnel are responsible for cleaning, refueling, and returning positive pressure fans to service after each use.

Benefits:

- Positive pressure ventilation (PPV) has many benefits to fire operations. They include:
  - PPV rapidly removes heat and smoke from the building, thus reducing the fires ability to propagate and advance.
  - PPV causes an improving atmosphere--thus improving patient survivability profiles.
  - Rapid removal of smoke improves fire fighters ability to conduct search and rescue operations as well as effective loss control operations.
  - The improved atmosphere and visibility increases the fire fighters ability to conduct the attack/extinguishment operations.
  - The improved atmosphere reduces fire fighter heat stress.
  - PPV reduces loss caused by smoke and fire damage to the structure.
  - PPV can reduce the need and risk of roof ventilation at many fires.

Application:

- Ladder 1301, Tanker 1303, and Engine 1304 are equipped with positive pressure fans.
- All offensive fire operations qualify for early application of positive pressure ventilation.
- Command should order the early use of PPV where appropriate.
- Personnel should expect to apply PPV and should dismount apparatus planning to take fans to the fire scene.

Fan Placement:

- Positive pressure fans should be placed at the point of entry(s) from the unburned side of the fire.
- Fans should be positioned 12-15 feet back from the entry point.
    - The objective is to create a pressure "cone" effect around the door.
    - This position will also allow access for crews to enter the building.
- Where additional fans are required, placing two or more fans in "tandem"--one behind the other is more effective than side by side.

Tactical Considerations:

- Positive pressure ventilation is effective only when applied properly.
- Two major items are required:
    - An "exit" for the pressurized air must be provided and must be located in the fire area.
        - This is generally a window, door or other opening.
    - Positive pressure ventilation must be injected from the unburned side of the fire.

- It will be the ladder company officers responsibility to ensure that these two requirements are completed prior to injecting positive pressure into the structure.

Controlling Airflow:

- Airflow from PPV must be controlled throughout the operation.
- Too many openings or exit points reduce the effectiveness of PPV.
    - In some cases, windows and doors that are already open may need to be closed to direct the airflow into the fire area, or the most densely affected smoke area.
- As one area is cleared of smoke, that area may need to be sealed off and another exit created in another area of the structure to direct the airflow into the next area to clear.

Multi-story Structures:

- Multi-story fires require greater coordination and additional fans, Utilize mutual aid if necessary and appropriate.
- Stairwells should be used to direct airflow from PPV.
- Multiple fans may be required.
- Two or more fans may be needed at the base of the building.
- Additional fans may be needed on landings at various levels in the stairwell. A fan will be needed at the entry to the fire floor.
- Multi-story positive pressure ventilation is complex. A Ventilation Sector should be established to coordinate all aspects of PPV on all floors.

Exposure Control:

- In some cases, PPV can be used for exposure control.
- This is most effective with common attics (i.e., strip shopping centers, apartment complexes) or where separating walls may have been breached (i.e. plumbing, cracks, etc).

- The objective is to introduce PPV ahead of a moving fire and force it back into the fire area. An exit point in the fire area is needed in most cases.
- For exposure control, the fans(s) would be placed at an entry point at most severe exposure first. If a heavy smoke condition exits, it may be beneficial to create a temporary opening (i.e., door) to allow an exit for the pressure and smoke. Once smoke has cleared, the exit should be closed, the building sealed, so that it will "over pressurize" the exposure. An opening in the ceiling will be required to pressurize the attic area. Over pressurized air will force hot gases back across the beaches, or back down common attic spaces towards the fire area. This can prevent fire-spread extension.
- The second most critical exposure would then receive PPV in a similar manner.
- The next priority would be the fire occupancy.

Large Buildings:

- Buildings with large square footage may require multiple fans, perhaps at more than one location to effectively remove smoke.
- These situations are more complex and require close coordination of PPV and a Ventilation Sector should be established to coordinate all aspects of this operation.

Precautions:

- Positive pressure ventilation can create problems if not effectively managed, monitored, and coordinated.
- Be aware of the problems listed below and take appropriate corrective action.
    - An exit must be in the burned area or the fire may be pushed into unburned portion.
    - Because of positive pressure, a "blow torch" effect of fire blowing far out of the exit may occur.
    - This is normal and predictable; adjacent exposures may need to be protected.

- Do not direct a fire stream into an operating PPV exit point.
- All concealed spaces need to be checked for extension.
- The Incident Commander will be responsible for monitoring and coordinating the application of PPV. The Incident Commander may appoint a ventilation sector to oversee all ventilation operations on the fire ground.

Note:

- The gas-powered fans do produce carbon monoxide and breathing apparatus may be required when PPV is used during overhaul operations.
- Consider using an electric PPV fan in areas where Carbon Monoxide may create additional hazards.