

<i>VENTILATION PROCEDURES</i>		TROY FIRE DEPT. TACTICAL PLAN 207.01	
<i>Issue</i>	<i>11/94</i>	<i>Revised</i>	<i>03/13</i>
			<i>Page 1 of 4</i>

SCOPE

This plan will outline basic operational procedures to be followed when operating at incidents requiring ventilation. Depending upon incident circumstances, the officer/supervisor assigned to perform ventilation may have to adopt or modify these procedures as necessary to achieve the desired outcome.

APPLICATION

Firefighters assigned the task of ventilation make up a "group" responsible for removing products of combustion and/or introducing fresh air into a building or specified area. This will normally be the result of a fire but may also include other situations such as hazardous materials incidents or confined space rescue applications.

Ventilation must be a coordinated effort with the fire attack/rescue operation. For the fire attack, hose lines must be in place and ready to apply water and/or make entry into the structure when ventilation begins and vice versa. For confined space rescue, fan(s) or blower(s) must be in place and operating prior to an entry or rescue attempt.

The main intent is to restore the local atmosphere to near normal conditions in minimal time. This will provide relief to firefighters inside a building attacking the fire by improving visibility and reducing heat; and will aid in the search, rescue, and evacuation of any occupants. This will also serve to introduce fresh air into a confined space and help purge contaminated air prior to the rescue attempt.

DEFINITIONS

Blower – Gasoline operated fan used for air movement at a fire or rescue incident. It is designed to be placed in a fresh air environment to direct fresh air into a contaminated space. It can be used for positive pressure ventilation.

Fan – Electrically operated fan used for air movement at a fire or rescue incident. It can be placed inside or outside of a contaminated space. It can be used for positive or negative pressure ventilation.

PROCEDURES

Ventilation may be achieved by either natural ventilation - making use of natural air movement and wind conditions; or mechanical ventilation - using mechanical equipment such as fans and blowers. When possible, the following steps shall be taken when performing ventilation:

- Survey the area to be ventilated from the interior and exterior. Check for damage, hazards, and number, size and location of possible exhaust openings.

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			<i>Page 2 of 4</i>

- Close off any non-contaminated areas.
- Close off any areas that are not to be immediately ventilated.
- When establishing a supply opening for ventilation, all attempts should be made to stay on the windward side of the building.
- Starting with the lowest level, begin ventilation by opening exhaust points doors, windows, etc. Then open fresh air supply until contaminants are reduced to an acceptable level.
- When the local atmosphere has reached, or is near normal conditions, close off the area and move to the next area. Working from the bottom to the top of the structure should provide for the quickest removal of contaminants.
- Personnel in the contaminated/hazardous environment should wear full protective clothing, including S.C.B.A. No civilians should be allowed access to these areas until contaminants are reduced to an acceptable level and the area has been deemed safe by the Ventilation Group Supervisor, Safety Officer, or Incident Commander.

CONSIDERATIONS

Regardless of the type of ventilation chosen, it is important to remember that window treatments such as screens, blinds, curtains, etc., must be removed for maximum air flow. Taking out "all the glass" in the structure must be avoided to allow for more effective control of air movement.

Gasoline operated blowers should remain in a location to allow sufficient make-up air to be introduced into the blower. This may mean, in most cases, that the blowers are to remain outside of the structure. This will reduce the noise level in the structure & not create an obstacle for fire fighters.

Gasoline blowers produce carbon monoxide (CO), even when operating properly. When using a blower in any confined space, air quality levels shall be electronically monitored for the safety of all occupants.

To assure continuity of ventilation, a firefighter should be assigned to monitor the fuel level of gasoline operated blowers. If equipment needs to shut down for refueling or maintenance, the appropriate officer/supervisor shall be advised and enough time allowed for equipment to cool and/or firefighters to leave a contaminated atmosphere if necessary.

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			<i>Page 3 of 4</i>

A second blower should be considered for replacement prior to shutting down the first blower. (See T.P. 212.03 for general maintenance of equipment.)

METHODS

- (See T.P. 208.16 for coordinated procedures)
- Horizontal Ventilation - Window(s) or door(s) may be opened or removed to allow air to move through the structure or space horizontally providing "cross ventilation". This method may be assisted by means of either positive or negative pressure ventilation.
- Vertical Ventilation - An opening is made in the roof or a skylight is removed directly over or close to the fire below allowing smoke, heat, and the products of combustion to escape the structure. This method may be assisted by means of either positive or negative pressure ventilation.
 - Putting firefighters above a fire is extremely dangerous.
 - UL & NIST studies have shown this technique, for the most part, to be ineffective
- Negative Pressure Ventilation (NPV) - This method involves setting up a fan in a window, door, or other opening on the leeward side of the structure or space to help pull smoke, etc., out of the building. Gasoline powered blowers should not be used for NPV. These devices require fresh air for proper operation. Drawing contaminated air past the air intake may work initially, but will reduce the life of the engine and eventually cause failure of the unit.
- Positive Pressure Ventilation (PPV) - This method involves setting up a blower or multiple blowers to push air into the structure or space through opening(s) and forcing smoke, etc., out through smaller or less number of opening(s). It is important to remember that effective PPV cannot be achieved if there is a greater number or larger size of exhaust openings than the input opening where air is introduced by the blower(s). A good rule of thumb is to keep the exhaust opening(s) no greater than 70% of the intake opening and to take advantage of natural wind conditions.
- Positive Pressure Attack (PPA) – This method is similar to the PPV method with the addition of a coordinated fire attack component. A ventilation opening is made close to the seat of the fire. A blower is placed at a desired entry point. Once the ventilation opening is made, air is forced into the structure ahead of the fire attack crew(s) to clear heat and smoke ahead of advancing firefighters.
- (See T.P. 212.02 for illustrations)

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TACTICAL PLAN
207.01**

Issue

11/94

Revised

03/13

Page 4 of 4

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