

**WESTERN RESERVE JOINT FIRE DISTRICT
SOP FOR RESPONDING TO
OIL BURNER EMERGENCIES**

A. General

Heating systems account for a significant number of all fires. Oil burners are also subject to failure. Most homes within the District operate on natural gas or electric heat. Nonetheless, some residential or commercial structures, especially on the North Hill (District 93) utilize an oil burner.

Fuel oils come in several grades, from No. 1 to No. 6. Among the factors that determine the grade is the flash point of the oil. It would be very undesirable to have a 257 gallon tank of highly flammable liquid inside of a person's home. Fuel oils, therefore, have flash points that are relatively safe. No 2 oil is the most common oil for one and two family homes. It has a minimum flash point of 100 degrees, but more impurities. No 4 oil may be used in mid-size applications, apartment buildings to factories, with a somewhat higher minimum flash point of 130 degrees. Even with this relatively high flash point, No. 4 oil requires no preheating. No. 5 oil also has a flash point of 130 degrees, but has more impurities than No. 4. It may be preheated to get the oil to flow easily. The heaviest heating oil is No. 6, with a minimum flash point of over 150 degrees. This requires heating to get it to burn as well as to flow smoothly. Both numbers 5 and 6 are primarily industrial oils used in large plants and apartment complexes. When the oils are stored, unused steam or hot water from the boiler is piped to heating coils within the oil storage tank. These heating pipes serve to preheat the oil at times to over 212 degrees Fahrenheit. Firefighters should be very cautious when operating around these high temperature tanks and piping, as they can cause burns. Also, these oils are often above their flash point, and any release will result in flammable vapor travel looking for a source of ignition.

B. Smoking Burner

Since the oil burner is a relatively complex machine that requires maintenance, there are several possible problems the fire department may be called to handle. The first, probably the easiest, problem to handle is the smoking burner. Conditions that cause smoking include clogged nozzles, clogged air supplies, worn-out pump and fan motors and improper or contaminated oil supplies. The smoke may back up out of the fire box, prompting the owner to contact the fire department.

Procedures for firefighters at such an incident are relatively simply. On approach, observe the chimney for thick smoke - remember, properly operating burners burn fairly clean. On arrival, verify from the occupants the cause for alarm, make a quick size-up, and locate and turn off the emergency switch. Turn off the oil tank valve, make an examination to assure the cause was minor, and advise the owner/occupant of the need for adjustments by a qualified serviceman.

C. Delayed Ignition

The second condition to which firefighters are called is delayed ignition, or “kick back”. In this case, the thermostat calls for heat and begins the start cycle, oil and air are discharged into the fire box, but for some reason ignition does not occur immediately. Oil and vapors fill the chamber and travel up the smoke pipe, while the primary control is trying at the same time to recycle the start-up. If it is successful and does produce this source of ignition, the entire oil vapor cloud ignites almost at once. This will be accompanied by a loud thud, similar to an explosion, which may knock the smoke pipe loose from the chimney or blow open the burner door. Either one will allow smoke to enter the burner room. Burning oil may have pooled in the bottom of the fire box or run out onto the floor. If fire has extended to nearby combustibles, handle the incident as any cellar fire, keeping in mind that the burner must be controlled by shutting down power and fuel.

More often, though, the fire is confined to the burner in the immediate area. Occupants frequently report “an explosion in the cellar”. Arriving units are often met by occupants reporting a loud bang and black smoke showing. At such an incident, firefighters should taken the following steps:

- Enter the basement to examine area;
- Stretch a hand line as a backup;
- Use a portable extinguisher (AFFF, dry chemical or CO-2) only if oil is burning outside the burner;
- Ventilate the area;
- Shut off oil at the tank;
- Examine the area for extension of fire;
- Advise the owner to call a serviceman.

If fire is burning inside the fire box, allow it to burn itself out - the use of water or dry chemical inside the fire box may cause unnecessary damage. Remember, the fire box is supposed to have fire in it; this is not abnormal. Water is particularly dangerous - water cooling hot cast iron could cause the box to crack and allow steam, hot water or both to spray firefighters.

D. The White Ghost

The least common oil burner response is also the most dangerous. In the case of the “white ghost”, a truly life-threatening emergency exists for both occupants and

firefighters. The white ghost is a cloud of vaporized oil and air mixture heated above its flash point and out of its container, looking for a source of ignition. It is usually produced when a burner that has been running at a peak for a long period shuts down and is very shortly called on for more heat. This is fairly common in severe cold spells. If there is a delay in the ignition, however, the air/oil mixture in a fire box is vaporized by the high heated walls of the burner, creating a fog-like mist with the smell of fuel oil. The vaporization causes the mixture to expand, often filling its surroundings with a highly flammable combination of heated oil vapor and air. If it finds an ignition source, it will cause an explosion and can blow down walls and floors.

Fire units encountering this kind of situation should take the following steps immediately to prevent ignition and protect life:

- Immediately evacuate the entire building;
- Do not enter the cloud for any reason;
- Shut down remote control, using SCBA and fog nozzle open in a wide pattern as protection;
- Use the fog nozzle to saturate and cool the cloud;
- Vent the area;
- Secure any other sources of ignition;
- Shut off fuel.

As with all oil burner responses, the responsible person in charge of the building should be directed, preferably in writing, to have the burner inspected by a qualified repairman.