



# Coffee Break Training - Fire Protection Series

## Access and Water Supplies: Elevated Water Supply Tank Heating

No. FP-2012-44 October 30, 2012

**Learning Objective:** The student shall be able to identify the tank heating requirements for elevated water supply tanks.

In many parts of the world, wintertime temperatures drop to the point where static water supplies are in danger of freezing. Ice plugs in outlet pipes or thick concentrations of ice inside a tank may block water flow or even result in catastrophic failure of the tank. Elevated tanks and their risers (pipes used to deliver water from the tank to the distribution network or fire protection systems) are particularly susceptible to cold conditions.

National Fire Protection Association (NFPA) 22, *Standard for Water Tanks for Private Fire Protection*, provides guidance on methods to minimize the freezing potential of insulated and uninsulated elevated and suction steel tanks, elevated wood tanks, and embankment-supported fabric tanks. Where a heating system is provided based on the lowest one-day mean temperature for a location, the water must be maintained at a temperature at or above 42 °F (5.6 °C) during the coldest weather. Furthermore, a low water temperature alarm set at 40 °F (4.4 °C) must be provided.

Steam heat is the preferred method of keeping elevated water tanks warm in extreme climates, although thermostatically controlled electric heaters are permitted when the lowest mean one-day temperature does not drop below 15 °F (-9.4 °C). The following table summarizes the heating requirements based on temperature and riser size.

Lowest One-Day Mean Temperature		Unprotected Riser Size	Preferred Heating Method
<5 °F	< -15 °C	≥3 feet (0.91 m)	Gravity circulation method using a steam-heated vertical radiator system.
≥5 °F	≥-15 °C	<3 feet (0.91 m)	When only intermittent heating is required, it should be provided by water circulation, immersed steam coils, or by blowing steam from a supply that is directed into the water.
≥5 °F	≥-15 °C	≥3 feet (0.91 m)	No heating required.
>15 °F	>-9.4 °C	<3 feet (0.91 m)	Steam loop or steam radiator, or thermostatically controlled electric strip heaters located inside the frostproof casing.

For additional information, refer to NFPA 22, Chapter 16.



The water in this elevated supply tank is susceptible to freezing and should be provided with a heating source.

