Winter Storm Primer

This Primer is designed to describe the types of severe winter storms and the impacts that they could cause. OCIA will release additional analysis as needed if a winter storm were to occur.

FREEZING RAIN

Forms when snowflakes completely melt as they fall through a deep layer of warm air, fall through a following shallow layer of cold air and then refreeze.

SLEET

Forms when snowflakes partially melt as they fall through a shallow layer of warm air, then refreeze as they fall through a following deep layer of cold air becoming frozen rain drops that bounce off the ground.

SNOW

Collections of ice crystals that stick to each other as they fall toward the ground; snow continues to fall as long as the temperature remains at or below 0 degrees Celsius (32 degrees Fahrenheit).

TYPES OF SEVERE WINTER STORMS

- **Blizzard:** Winds over 35 miles per hour with blowing snow which reduces visibility to one-quarter of a mile or less for at least 3 hours. Heavy snowfall and severe cold often occur with blizzards, but they are not required; strong winds can pick up snow that already has fallen creating blizzard conditions.

- **Ice Storm:** Freezing rain storms that last several hours or more and result in at lease one-quarter inch of ice forming on exposed surfaces.

- **Lake Effect Storm:** A cold, dry air mass moves across a lake and picks up moisture; this fills the air with water which is released in the form of snow; these can occur anywhere, but most often occur in the Great Lakes Region between November and February; these storms ten to create heavily localized snowfall; Buffalo, New York is one of the best known and most common locations for this phenomenon.

- **Snow Squall:** Brief and intense snow showers with strong and gusty winds which can result in significant accumulation of snow.

POTENTIAL INFRASTRUCTURE IMPACTS

- **Transportation Sector:** Roads, rail systems, ports and waterways, and airports can be disrupted due to the snow, ice, and wind-blown debris. Airports may experience flight delays and cancellations. Commuter rail systems powered using electrified rail may experience disruptions if snow accumulations are greater than 6 inches due to the inability to receive power from the "third rail." Icing of port infrastructures, vessel superstructures, and ocean structures can occur when the air temperature becomes colder than the freezing point of seawater and frozen spray covers docks, bulkheads, locks, decks, and rigging. Ice formation on inland waterways can cause impacts to navigation.

- **Energy Sector:** Ice and snow can damage electric power distribution systems causing electric power outages. Severe cold can change the properties of oil causing it to thicken to the point where it can clog filters or stop flowing. Water can enter the propane distribution system through trucks, railcars and barges insufficiently purged of moisture before filling and potentially damage or impair the operation of pipes, valves, pumps or appliances if it freezes. At the consumer level, extreme cold (-44°F) can cause propane to freeze inside of storage tanks that are not sufficiently insulated.

- **Communications Sector:** Localized communications outages may occur due to wind and ice damage to pole-mounted communications systems and cellular towers. Wireless telecommunications switching centers can be expected to continue operation in the absence of an extended power outage.

- **Emergency Services Sector:** Short delays in emergency response times may occur due to transportation and electrical power impacts.

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