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CONNECTICUT ICE SAFETY MANAGEMENT PLAN
SITING COUNCIL WIND COLEBROOK NORTH

The primary precaution for ice throw is to provide for proper setbacks. BNE has proposed setbacks that address ice throw concerns and comply with GE recommended setbacks. Below are the step-by-step procedures that BNE would follow in the event of potential turbine blade icing, and the techniques that would be employed prior to restart:

- Wind Colebrook North will be monitored 24 hours per day, 7 days per week. The turbines are expected to be monitored remotely by GE and by onsite personnel during regular business hours and icing events.
- During winter months when there is a potential for an icing event, BNE will restrict access to the site and place fences and warning signs as appropriate for the protection of site personnel and the public.
- BNE and GE will be continuously monitoring weather forecasts for conditions which are favorable to producing icing events. If there is a potential for an icing event, BNE and remote monitoring staff will monitor the total aggregate output of the facility in comparison to the actual wind speeds.
- The turbines operate within a specific operating range producing certain amounts of power at different wind speeds. Ice formation will affect the aerodynamics of the turbine blades and will decrease the power output of the turbines. If the power output is not within a certain range, the turbines will be automatically shut down.
- BNE will also employ the optional Winter Ice Operation Mode (WIOM) for the GE 1.6 MW wind turbines installed on the site. By optimizing pitch controls, the WIOM control option improves power output by minimizing the effects of icing on blade stall, which in turn reduces potential blade vibrations.
- In addition to this system, the turbines will be equipped with vibration sensors which will detect imbalance. If ice does start to form on the blades, the blades could become unbalanced and a vibration will be detected by the vibration sensors. If this occurs the turbines will automatically be shut down.
- The turbines can also be shut down remotely and manually on-site.

Re-start procedure:

- If the turbines are shut down due to icing, BNE will be responsible for monitoring the turbines until the ice has fallen from the blades and the turbines can resume normal operating conditions.

- There is no specific technique to remove ice build-up on the blades. It is common to wait for the ice to melt and fall from the blades. BNE will thoroughly inspect the turbines to ensure that there is no remaining ice on the blades prior to restart.
- The turbines will remain shut-down until BNE can assess the operating conditions of the turbine. At that time, BNE may restart the turbines provided that the area affected by possible ice falling is appropriately monitored to prevent injury to people in the area or damage to property. A designated technician will be present at the turbine site before and after an iced turbine is started up. This individual will assess the suitability of restarting an iced turbine for any potential impact to adjacent individuals or property.
- In extreme conditions, BNE will curtail or shut down turbines in advance of subjecting the turbines to ice build-up on the turbine blades and risk of ice throw. Depending on the wind direction and conditions of the icing event, turbines may be manually positioned (by yawing) out of the upwind position to reduce direct ice build-up on the turbine and blades. The turbines will remain shut-down until weather conditions improve. BNE will thoroughly inspect and validate the turbines to ensure that there is no remaining ice on the blades prior to restart. A designated technician will be present at the turbine site before and after the turbines are started up to ensure safe operations.