The Wind Energy Institute of Canada (WEICan), located in North Cape, Prince Edward Island, has been leading the development of wind energy across Canada through technical testing and consultation; research, development and demonstration; and outreach since its formation in 1981. As a national research facility and independent wind farm and battery energy storage system operator, with strong industry ties, WEICan is well-positioned to lead research in the advancement of wind energy.

WEICan received funding through NRCan’s Clean Energy Fund and a loan from the province of PEI to own and operate a Wind R&D Park that features five 2 MW wind turbines and a storage system with a 1 MW/2 MWh capacity. WEICan views this infrastructure as a laboratory that is available for research and is open to collaboration with interested parties.

**WIND R&D PARK**

**WIND TURBINE PERFORMANCE**

Since commissioning in 2013, WEICan’s 10 MW Wind R&D Park turbines have generated over 180.2 GWh of energy.

**Attributes of the Wind R&D Park’s DeWind D9.2 turbines:**
- Reliable operation in harsh coastal environment and cold weather
- Direct medium voltage tie-in of the D9.2’s 13.8 kV synchronous generator
- Voltage control capabilities providing stability to utility grid presents a unique opportunity to view impact on grid
- Integration of battery grid stability support in the future

**2016 Performance Statistics (January 2016-December 2016):**
- 41.9 GWh energy produced
- 91% Availability
- 48% Capacity Factor

**Wind R&D Park Wind Turbine Specifications:**
- Installed Turbine Capacity: 10 MW
- Number of Wind Turbines: 5
- Model: DeWind D9.2
- Frequency: 60 Hz
- Cut In Wind Speed: 4 m/s
- Cut Out Wind Speed: 25 m/s

**RESEARCH PROJECTS HIGHLIGHTS**

**Wind energy grid integration:**
Objective is to understand how wind turbine operation and energy storage can offer benefits in wind energy integration into the grid. Scenarios tested include:
- Demand/Energy Avoidance
- Automatic Generation Control
- Diesel Displacement
- Time Shifting

**Service Life Estimation:**
WEICan is interested in how factors such as complex terrain, high capacity factors, icing and severe weather, cold climate, and delayed maintenance cycles will impact turbine service life and/or performance degradation.
Data is collected from SCADA, log books, condition monitoring equipment, and meteorological masts to estimate wind turbine service life.

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