

**MONTANA-DAKOTA UTILITIES CO.
SOUTH DAKOTA PUBLIC UTILITIES COMMISSION
SECOND DATA REQUEST ISSUED MARCH 24, 2020
DOCKET NO. EL20-009**

2-5. Refer to MDU's response to DR 1-4, part a.

- a. Explain why the MISO Generator Interconnection for the entire Thunder Spirit Wind project is only for 150 MW when the combined capacity of Thunder Spirit Wind is 155.5 MW.**
- b. Does this act as a bottleneck that limits the capacity of Thunder Spirit Wind? Explain.**
- c. Does this change any of the economic analysis that was performed for the original Thunder Spirit Wind or the expansion? Explain.**

Response:

a. The MISO generator interconnection agreement for Thunder Spirit Wind is limited to 150 MWs of generation as measured at the point at interconnection with the transmission system at Montana-Dakota's Hettinger 230kV Substation.

The 155.5 MW of project generation is calculated at the wind turbine level and does not account for electrical losses associated with underground collector system cables, transformers or system losses between the Thunder Spirit Wind Collector Substation and the point of interconnect at the Hettinger 230kV Substation, which total approximately 3 MWs of losses. An additional 3 MW turbine was added as a part of the expansion project because there is normally at least one wind turbine offline for maintenance or with a system fault.

The 155.5 MW of generation helps provide cost saving synergies with a larger expansion project size and best utilizes the interconnection capability of the project.

Any potential limitations on generation output capability result only if all the project wind turbines are on-line and wind speeds are at or near rated output conditions at all the wind turbines.

b. No. See response a above.

c. No. The project phases were financially modeled at 107.5 MWs and 48 MWs in size for capital cost and annual energy production. The annual expected energy production used the expected project capacity factor and the project output size calculated at the generators.

As noted in part a above, generation would rarely be curtailed due to the MISO generation interconnection limitation and the projected capacity factors used in the financial models produce reasonable results.