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| **Integration of Degradation Processes in a Strategic Offshore Wind Farm O&M Simulation Model** |
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| **Abstract** | Decision support models for offshore wind farm operation and maintenance (O&M) are required to represent the failure behavior of wind turbine components. Detailed degradation modelling is already incorporated in models for specific components and applications. However, component degradation is only one of many effects that must be captured in high-level strategic decision support models that simulate entire wind farms. Thus, for practical applications, a trade-off is needed between detailed degradation modelling and the level of simplicity of input data representation. To this end, this paper discusses two alternative approaches for taking into account component degradation processes in strategic offshore wind farm O&M simulation models: (1) full integration of the degradation process in the O&M simulation model; and (2) loose integration where the degradation process is translated into simplified input to the O&M model. As a proof-of-concept, a Markov process for blade degradation has been considered. Simulations using the NOWIcob O&M model show that the difference between full and loose integration is small in terms of aggregated output parameters such as average wind turbine availability and O&M costs. Although loose integration models some effects less accurately than full integration, the former is more flexible and convenient, and the accuracy is for most purposes sufficient for such O&M models. |
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