



DURBAN UNIVERSITY OF TECHNOLOGY
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Department of Electrical Power Engineering

Postgraduate Research Candidate



#	Student Name / Surname	Nicky Kamwi Mbaimbai	Start Date	June 2020	Supervisor	Professor I.E. Davidson
	Title of Project	Investigating the Impact of Integrating Large Offshore Wind Farms with VSC-HVDC Technology on the Namibian Grid Stability	Completion	August 2021	Co-Supervisor(s)	
	Program of Study (M Eng. / D Eng.)		M Eng			
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Synopsis of Research Project: (< 300 words)						
<p>Namibia has a high potential of harnessing wind energy for generation of electricity to meet its power demand. The major challenge in the implementation of wind farms is their integration with the AC grid. Integration of wind farms to the AC grid possess a technical challenge to power system operators because previous studies show that the integration of renewable energy sources to the grid may reduce the grid stability, mainly in terms of the voltage stability. From literature read thus far, most of the past research has focused on feasibility studies of renewable energy potential but there is no documentation on how the vast offshore wind resource can be harnessed and integrated to the Namibian grid.</p> <p>The study will focus on the impact of integrating large offshore wind farms on the Namibian grid stability. Models of offshore wind farms and VSC-HVDC switching technology will be developed whereas a reduced model of the NamPower grid will be used as the case study. In addition to this, models of doubly fed induction generators (DFIG), which are commonly used wind turbines in offshore installations will be analysed through the use of mathematical formula with the results of these calculations being compared to the results of the DFIG models that will be developed using DlgSILENT PowerFactory. Load flow analysis and stability studies will be run on the models in order to assess the stability of the AC grid in relations to the performance of the wind farm. The research findings would serve as a guideline to the power utility company on how best to integrate offshore wind farms to the grid without affecting the performance of the grid significantly. The results of this study may also assist network planners in the decision-making process by assessing the technical performance of the grid.</p>						