












Innovation Competitions - Full Submission

Supplementary Answer Form

Tick if this answer has been provided verbally: ☐

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| Project code | WPDT206 | Question Number | 44 |
| Question date | 2 nd October 2014 | Answer date | 06 October 2014 |
| Submission section question relates to | Section 4 | | |
| Topic | Incremental learning | | |
| Question | Are there any examples (anywhere in the world) where the FPL technology you propose to trial has been used to link two 33kV networks to increase network capacity? | | |
| Notes on question | The important aspects of Flexible Power Links are the Power Electronics elements as generally simple transformers are used for the direct connection to the networks. This answer therefore focusses on examples of where similar Power Electronics have been used in the application proposed in this project with a range of connection voltages. | | |
| Answer | <p>The first Flexible Power Link (B2B DC link) installation using VSC (Voltage Source Conversion) was at Eagle Pass, Texas. A 36MVA link uses transformers to connect two separate 138kV networks together, increasing network capacity as well as providing additional benefits such as stability and black start capability. This was commissioned in September 2000.</p> <p>Since the Eagle Pass installation, there have been numerous installations where the VSC (Flexible Power Link technology) we propose to use in Network Equilibrium has been used for both industrial and network applications. These applications have a range of capacities (greater and lower than proposed in Network Equilibrium capacity) and a range of voltages (higher and lower than proposed Network Equilibrium voltage) using transformers to connect the same power electronics to the required networks.</p> <p>As detailed in the information provided by manufacturers (attached below), transformers are used to connect power electronics to the desired voltage, including an industrial application where an 11kV and 33kV network have been connected together with a 19MVA FPL.</p> | | |

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| | <p>One of the most recent examples of FPL technology is the Mackinac installation (138kVA, 200MVA) which has increased the network capacity in the upper Midwestern USA.</p> <p>ABB, RXPE, Ingeteam and GE have provided additional information to WPD with case studies to support this answer.</p> <p>Please find attached the information and letters received.</p> |
| Attachments | <div><div> PCS 6000 STATCOM_INCO_EN.</div><div> A02-0174_Eagle Pass_LR.pdf</div><div> Port Gothenburg - Recommendation lett</div><div> RXPE FPL Case Studies for WPD.pdf</div><div> Annex 2 - MVDC References.pdf</div><div> Annex 1 - RXPE Case Study - MVDC.pdf</div><div> Annex 3 - Severn Drives & Energy Brocl</div><div> GE-3_Project_Aschaf fenburg.pdf.pdf</div><div> GE-2_Project_Lehrte .pdf.pdf</div><div> GE-4_Project_Köln.p df.pdf</div><div> 2014-10-06 INGETEA - Letter of</div></div> |