INDEPENDENT INSULATION GROUP

CURRICULUM VITAE

Barry Carolan

Barry is a specialist in the field of power system analysis, grid code compliance and control system software development. He has 18 years of experience in the field, having worked both on the utility- and manufacturing sides. This perspective has given him a broad appreciation of the needs and requirements of system operators, technology manufacturers as well as end users. Over the years, he has developed expertise in industry-standard simulation tools, including PSCAD, PSS®E, and PowerFactory as well as simulation automation, data analysis and software integration.

MAIN FIELDS OF COMPETENCE

- Power System Analysis and Grid Code Compliance
- Control Systems Design, Modelling, Commissioning and Validation
- Software Development

WORK EXPERIENCE

2024-	**Independent Insulation Group Sweden AB**, Ludvika, Sweden *Senior Consultant*
2018-2024	**Hitachi Energy / ABB Power Systems HVDC,** Ludvika, Sweden *Senior Design Engineer* *Technical Solution Owner* *Technically Responsible*
2018	**H&MV Engineering,** Limerick, Ireland *Electrical Engineering Responsible*
2017	**Norconsult,** Östersund, Sweden *Electrical Engineering Consultant*
2012-2016	**ABB Power Systems HVDC,** Ludvika, Sweden *Project Engineer* *Technically Responsible*
2007-2012	**EirGrid,** Dublin, Ireland *Senior Power System Planning Engineer* *Power System Planning Engineer*

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EDUCATIONAL DEGREES

2007 **BE (Hons, First Class) Electrical Engineering**
University College Dublin, Ireland

CITIZENSHIP

Sweden, Ireland

LANGUAGES

Swedish (professional level), English (native)

LIST OF PROJECTS

2024 – ongoing **Independent Insulation Group**

Compliance simulations for (EU 2016/631 - RfG) process
Dynamic simulations confirming grid code (EU 2016/631 - RfG) compliance, *(PowerFactory)*

Compliance testing plan for (EU 2016/631 - RfG) process
Preparation of the compliance testing plan for a hybrid wind and PV PPM. Submission to DSO.

WECC model validation for (EU 2016/631 - RfG) process
Studies to validate the manufacturer supplied WECC model against the site compliance test results. *(PowerFactory)*

Simulation model Validation for (EU 2016/631 - RfG) process
Studies to validate the manufacturer supplied PowerFactory model against the site compliance test results. *(PowerFactory)*

Wind farm connection studies for (EU 2016/631 - RfG) process
Studies confirming grid code (EU 2016/631 - RfG) compliance, reactive power capability and cable dimensioning based on loading and short-circuit currents. *(PowerFactory)*

Power quality studies, Harmonic filter design for renewable energy connection
Simulation of harmonic distortion levels from a large PV park with comparison to grid code compliance levels. Responsible for evaluating requirement for a harmonic filter. Harmonic filter dimensioning and design. *(PowerFactory)*

Compliance testing for power park modules in accordance with (EU 2016/631 - RfG)
Compliance testing of windfarm in operation together with manufacturer, DSO and park developer. Responsible for leading the compliance tests and analysing the results to determine compliance. Preparation of compliance report for submission to DSO. *(PowerFactory)*

2024 – 2018 **Hitachi Energy**

Technical Solution Owner Software Tools and Simulation
Development of a new software environment for performing, evaluating, and visualizing dynamic study results. *(python)*

Dynamic Performance Dogger Bank Wind Farm (3 × 1200 - 1400 MW HVDC)
Overall responsible for development of Dogger Bank A, B and C project control system and dynamic studies for Grid Code Compliance, (EU 2016/631 - RfG) and UK Grid Code.

	Developed several novel functions. Offshore AC network protection coordination study. *(PSCAD, PowerFactory)* **Raigar – Pugalur ±800kV 6000 MW HVDC** Dynamic performance studies for multiterminal HVDC system. Sub-synchronous torsional interaction studies and damping controller development. Customer training. Factory Acceptance Testing for control system. *(PSCAD, PSSE)*
2017	**H&MV Engineering, Electrical Engineering Responsible** Reviewed substation design, supported design team Identification and evaluation of equipment manufacturers and sub-contractors Cost estimation, site visits and stakeholder discussions Company representative at Factory Acceptance Testing
2016	**Norconsult, Electrical Engineering Consultant** Feasibility Study for 40 kV substation refurbishment *(AutoCAD)* Protection Coordination Wind Farm *(PSSE, python)* 40 kV Network Expansion Study *(PSSE, python)* Hydro Turbine Generator Specification of Reactance and Moment of Inertia *(PSSE, python)* Feasibility Study for 40 kV substation refurbishment *(AutoCAD)* Power Quality Evaluation for data center *(Elspec PQ Sapphire)* Wind Farm reliability and availability study *(Python)* Wind Farm grid code compliance study, (EU 2016/631 - RfG) *(PSSE, python)* Wind Farm grid code compliance study, (EU 2016/631 - RfG) *(PSSE, python)* Wind Farm grid code compliance study, (EU 2016/631 - RfG) *(PSSE, python)* Wind Farm PSSE Network equivalent, (EU 2016/631 - RfG) *(PSSE)*
2012 - 2015	**ABB Power Systems** **Kontek (Sweden – Germany 600 MW)** AC Network Equivalents, Dynamic Performance Study, Sub-Synchronous Torsional Interaction Study, Load-Flow and Stability Study, Damping Regulator Design. *(PSCAD, PSSE, PowerFactory, E-Tran, MATLAB, python)* **Madawaska (Canada 300 MW)** AC Network Equivalents, Dynamic Performance Study, Sub-Synchronous Resonance Study, Low-Order Harmonics Study, Load-Flow and Stability Study, Frequency Control Design. Emergency Power Study and Runback Scheme Design. *(PSCAD)* **1100 kV UHVDC 10 GW (Prefeasibility)** Evaluation and development of control system functions for very long distance HVDC transmission. *(PSCAD, PSLF)* **Three-Terminal HVDC Scheme 3500 MW (Prefeasibility)**

Evaluation and development of control system functions for extremely weak AC network. Evaluation of various combinations of Synchronous Compensator, STATCOM and SVC to facilitate stable HVDC transmission. *(PSCAD, PSSE)*

3000 MW HVDC Project (Tender)
AC Network Equivalents, Dynamic Performance Study *(PSCAD, PSSE)*

3000 MW HVDC Project (Tender)
AC Network Equivalents, Dynamic Performance Study *(PSCAD, PSSE)*

2000 MW HVDC Project (Tender)
AC Network Equivalents, Dynamic Performance Study *(PSCAD, PSSE)*

Celilo PDCI Upgrade (USA 3800 MW)
Dynamic Performance Study, Factory Acceptance Testing, Site Commissioning Support, PSCAD Model Development, PSCAD Model Validation, *(PSCAD, PSSE)*

Railroad DC Tie (USA – Mexico 300 MW)
Dynamic Performance Study, AC Network Equivalents, Sub-Synchronous Torsional Interaction Study, Factory Acceptance Testing, Site Commissioning, PSCAD Model Development, PSCAD Model Validation, *(PSCAD, PSSE)*

2007 - 2012 **EirGrid**

Ireland – Great Britain HVDC
Review of East – West Interconnector technical reports. Grid Code Compliance.

Prefeasibility Study Offshore Energy Clusters
Identification of optimal locations for connection of 7500 MW offshore renewable energy in 2030. Combined optimisation considering ocean depth, wind resource, transmission constraints and capital cost of connection. *(PSSE, python)*

Onshore Energy Clusters
Automated N-1 contingency analysis for maximisation levels of renewable generation connected to the transmission network by 2025. Analysis to assign earliest connection dates to 10 GW of renewable and conventional generation. *(PSSE, python)*

Ireland – France HVDC
Collaboration with RTE to investigate technical feasibility of an Ireland – France HVDC interconnection across the Celtic Sea "Celtic Interconnector". Identification of studies requirements and benchmarking of planning criteria and grid codes. Identification of favourable connection stations and potential interconnector size. *(PSSE)*

Prefeasibility Study
Automated N-1 contingency analysis for optimisation of connection of large clusters of renewable generation to the transmission network. *(PSSE, python)*

Western Region
Short-circuit studies. Review of running arrangements after life extension of thermal generation in western region. Evaluation of approaches for mitigation of high short-circuit levels. *(PSSE)*

LNG Terminal
Developed preferred method of connection for a large LNG terminal to the 110 kV transmission system. Load-flow, voltage stability and short circuit studies. *(PSSE)*

Dublin Bay Thermal Generation
Load flow and dynamic studies for a new 400 MW thermal generation facility in Dublin area. Voltage stability analysis: management of over- and over voltage on cable networks.

Complex running arrangements in heavily constrained urban transmission system. Verification of grid code compliance. *(PSSE)*

Southwest Region
Short circuit studies for 110- and 220 kV switchgear rating due to connection of 1500 MW cluster of renewable generation. *(PSSE)*