Paris Session 2022

EirGrid considerations on models and low system strength

C4-PS3- Q19

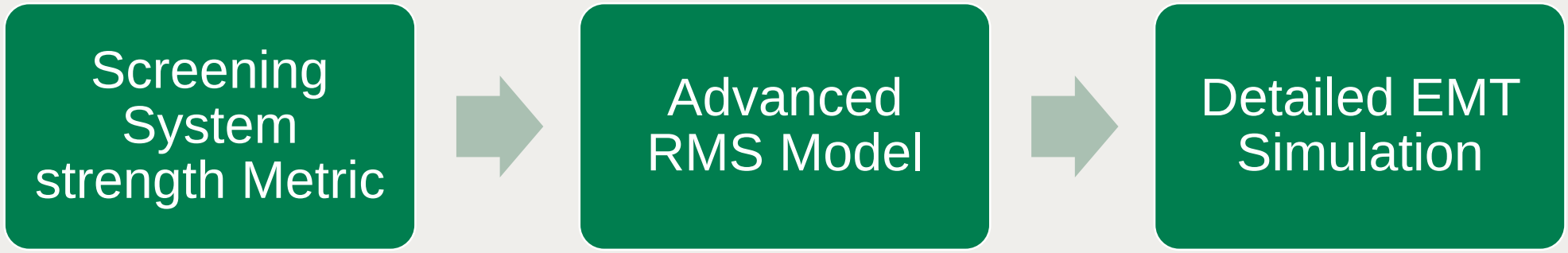
What modelling tools (EMT or phasor-domain) and IBR dynamic modelling approaches (vendor-specific or generic models) have been used worldwide to develop forward looking dynamic models of years ahead power systems accounting for forthcoming network changes and emerging technologies?

Ismail Ibrahim (EirGrid, Ireland)

EirGrid's Control Centre Tool and IBR Models

- **Look Ahead Stability Assessment Tool (LSAT):**
  - Real-time and offline study applications with look-ahead capability.
  - Performs dynamic and steady-state analysis around 800 credible contingencies for every 5 minutes.
- **Dynamic models :**
  - A combination of WECC 1st generation and WECC 2nd generation models for IBRs are used.
  - In the process of converting all WECC 1st generation models to WECC 2nd generation models with site-specific parameters.

- **In collaboration with EPRI, EirGrid has been trying to bridge the gap between the required modelling adequacy and analysis practicalities. We propose a 3-step process to deal with low system strength scenarios.**



Group Discussion Meeting

3- STEP PROCESS

Screening System Strength Metric

- EPRI has developed the Grid Strength Assessment Tool (GSAT) which we have used to screen scenarios and to identify potential risk of converter instabilities.

- This tool is developed with an advanced critical clearance time (CCT) metric based on steady-state short circuit analysis and accounts for converter control behavior during disturbances analytically.

Advanced RMS Model

- Developing an RMS model which includes the PLL and the current controller dynamic behavior.
- An add-on to our existing WECC 2nd generation model.
- Developing RMS models for the grid-forming converters

Detailed EMT Simulations

- EMT simulations are both modelling and computation-wise demanding and perform EMT analysis when strictly necessary.