

MODELS FOR NON-SYNCHRONOUS GENERATORS

For a non-synchronous Large Generating Facility, Interconnection Customer shall provide (1) a validated user-defined root mean squared (RMS) positive sequence dynamics model; (2) an appropriately parameterized generic library RMS positive sequence dynamics model, including model block diagram of the inverter control and plant control systems, as defined by the selection in Table 1 or a model otherwise approved by the Western Electricity Coordinating Council, that corresponds to Interconnection Customer's Large Generating Facility; and (3) if applicable, a validated electromagnetic transient model if Transmission Provider performs an electromagnetic transient study as part of the interconnection study process. A user-defined model is a set of programming code created by equipment manufacturers or developers that captures the latest features of controllers that are mainly software based and represents the entities' control strategies but does not necessarily correspond to any generic library model. Interconnection Customer must also demonstrate that the model is validated by providing evidence that the equipment behavior is consistent with the model behavior (e.g., an attestation from Interconnection Customer that the model accurately represents the entire Large Generating Facility; attestations from each equipment manufacturer that the user defined model accurately represents the component of the Large Generating Facility; or test data).

Table 1: Acceptable Generic Library RMS Positive Sequence Dynamics Models

GE PSLE	Siemens PSS/E*	PowerWorld Simulator	Description
pvd		PVD1	Distributed PV system model
der_a	DERAU1	DER_A	Distributed energy resource model
regc_a	REGCAU1, REGCA1	REGC_A	Generator converter model
regc_b	REGCBU1	REGC_B	Generator converter model
wt1g	WT1G1	WT1G and WT1G1	Wind turbine model for Type-1 wind turbines (conventional directly connected induction generator)
wt2g	WT2G1	WT2G and WT2G1	Generator model for generic Type-2 wind turbines
wt2e	WT2E1	WT2E and WT2E1	Rotor resistance control model for wound-rotor induction wind-turbine generator wt2g
reec_a	REECAU1, REECA1	REEC_A	Renewable energy electrical control model
reec_c	REECCU1	REEC_C	Electrical control model for battery energy storage system
reec_d	REECDU1	REEC_D	Renewable energy electrical control model
wt1t	WT12T1	WT1T and WT12T1	Wind turbine model for Type-1 wind turbines (conventional directly connected induction generator)
wt1p_b	wt1p_b	WT12A1U_B	Generic wind turbine pitch controller for WTGs of Types 1 and 2
wt2t	WT12T1	WT2T	Wind turbine model for Type-2 wind turbines (directly connected induction generator wind turbines with an

			external rotor resistance)
wtgt_a	WTDTAU1, WTDTA1	WTGT_A	Wind turbine drive train model
GE PSLF	Siemens PSS/E*	PowerWorld Simulator	Description
wtga_a	WTARAU1, WTARA1	WTGA_A	Simple aerodynamic model
wtgp_a	WTPTAU1, WTPTA1	WTGPT_A	Wind Turbine Generator Pitch controller
wtgq_a	WTTQAU1, WTTQA1	WTGTRQ_AQ	Wind Turbine Generator Torque controller
wtgwgo_a	WTGWGOAU	WTGWGO_A	Supplementary control model for Weak Grids
wtgibffr_a	WTGIBFFRA	WTGIBFFR_A	Inertial-base fast frequency response control
wtgp_b	WTPTBU1	WTGPT_B	Wind Turbine Generator Pitch controller
wtgt_b	WTDTBU1	WTGT_B	Drive train model
repc_a	Type 4: REPCAU1 (v33), REPCA1 (v34) Type 3: REPCTAU1 (v33), REPCTA1 (v34)	REPC_A	Power Plant Controller
repc_b	PLNTBU1	REPC_B	Power Plant Level Controller for controlling several plants devices In regard to Siemens PSSE/E*: Names of other models for interface with other devices: REA3XBU1, REAX4BU1 – for interface with Type 3 and 4 renewable machines SWSAXBU1 – for interface with SVC (modeled as switched shunt in powerflow) SYNAXBU1 – for interface with synchronous condenser FCTAXBU1 – for interface with FACTS device
repc_c	REPCCU	REPC_C	Power plant controller