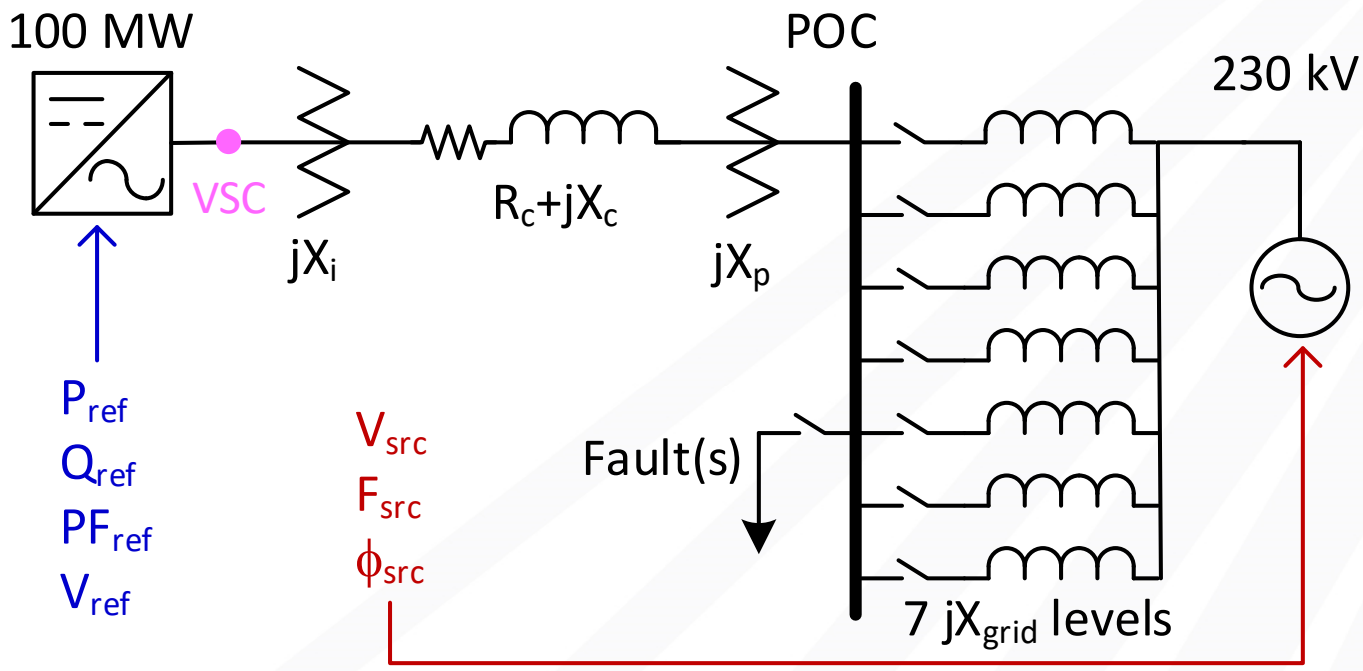
Plant model testing framework on a weak grid; IEEE P2800.2 SG3 contemplates testing at SCR = 2.5, details in D0.5, clause 7.



For SCR=2.5 at the VSC terminal (reactance values at 230 kV)

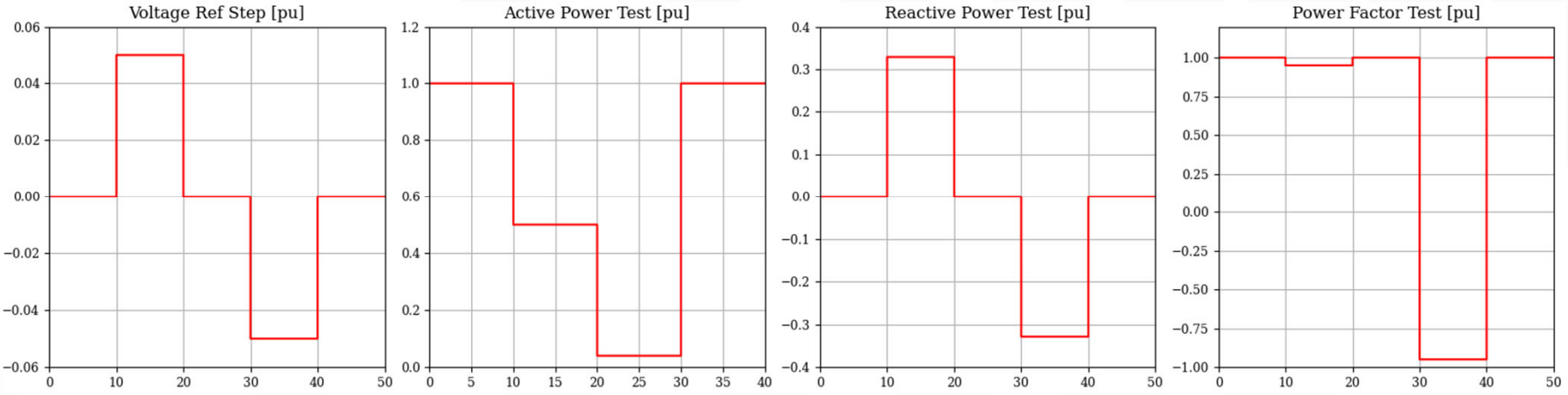
Example	Xi	Xc	Xp	Xgrid	Xtotal	SCMVA
Solar	10.58	0.00	63.48	137.54	211.60	250.0
Wind	30.23	6.42	63.48	111.47	211.60	250.0

Maximum SCR at VSC when Xgrid≈0:

Example	Xplant	SCMVA
Solar	74.06	714.3
Wind	100.13	528.3

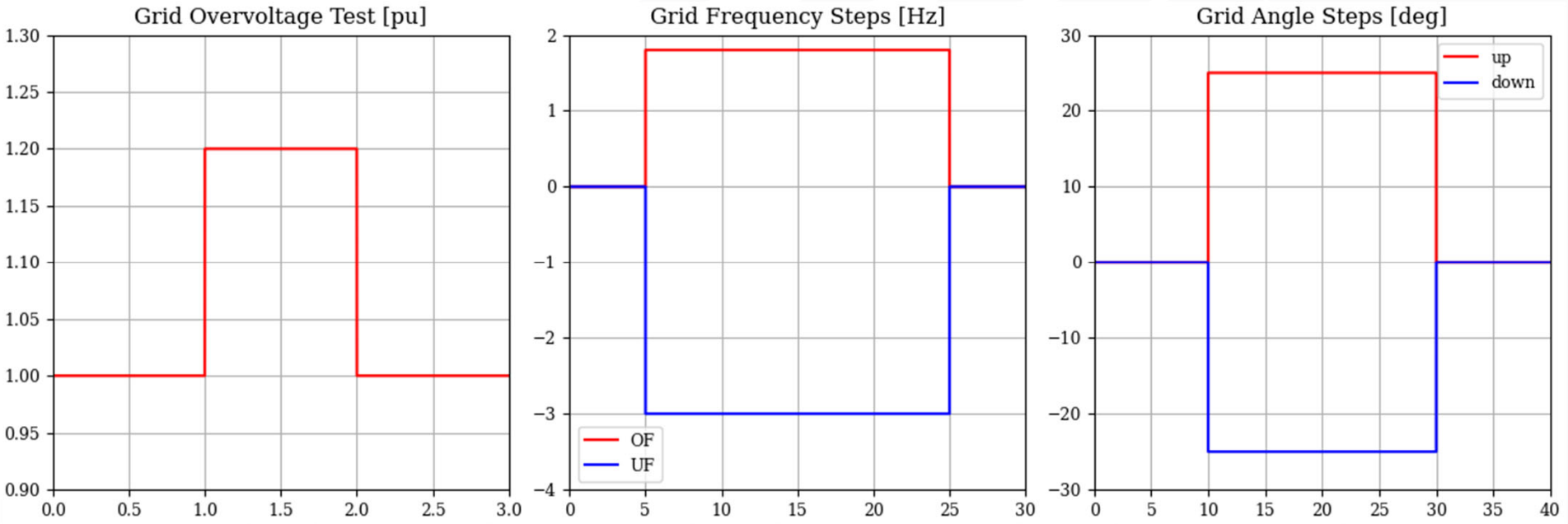
Model initialization, undervoltage, and control step tests are automated with IBR control references and fault parameters.

- **fs**: 14 flat-start tests to initialize *from zero* in 10s, remain stable for 10s
  - P = inverter continuous rating (ICR) and P_{min}, 7 variations each:
    - V_{ref}=1; Q_{ref}=[0.3287, 0, -0.3287]; pf_{ref}=[0.95, 1.0, -0.95]
- **uv**: 15 undervoltage ride-through tests, fault duration=0.16s, all at P=ICR
  - 3 fixed Q values of 0.3287, 0, -0.3287 pu
  - 5 fault types [3ϕ sag to 50% voltage, 3ϕg, 1ϕg, 2ϕg, 2ϕ]
- **st**: 4 control reference change tests plotted below



P2800.2 grid overvoltage, frequency change, and angle jump tests are implemented with controlled grid sources.

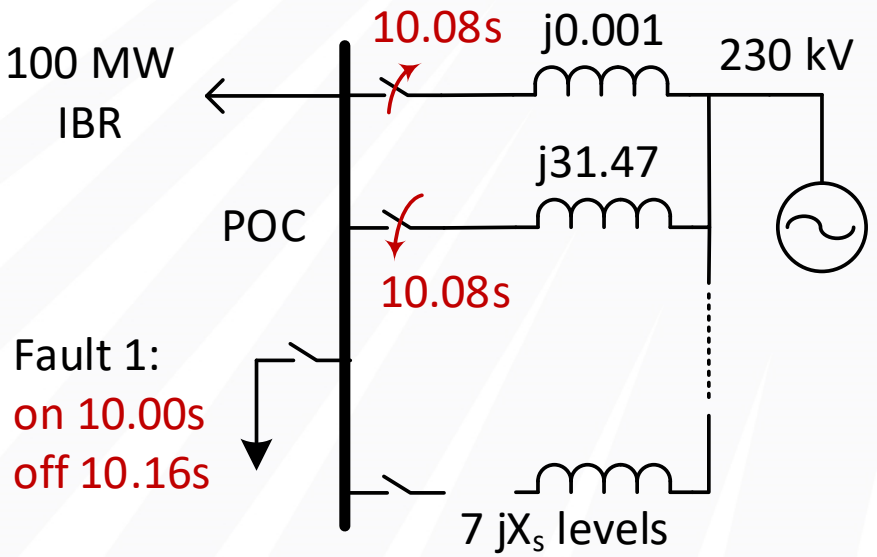
- **ov**: 3 overvoltage ride-through tests at P=ICR and 3 fixed Q values:
  - Q = 0, +0.3287, -0.3287
- **fr**: 4 frequency ride-through tests, over/under at P=ICR and P_{min}, fixed Q=0
- **an**: 4 angle ride-through tests, positive/negative at P=ICR and P_{min}, fixed Q=0



Short-circuit ratio (SCR) ramp-down tests transition between impedances during faults at 5-second intervals.

P2800.2/D0.5, Clause 7.3.5.1.2
POC SCR Change Informational Tests
Stable operation expected until SCR=2.5

Range [s]	SCR	X @ 230 kV
0-5	20	26.45
5-10	10	52.90
10-15	5	105.80
15-20	4	132.25
20-25	3	176.33
25-30	2.5	211.60
30-35	2	264.50
35-40	1.5	352.67
40-45	1	529.00



This test is simulated manually, with sequenced faults and changes in source impedance.