



Assessment Tests for Parallel Embedded Generation via Inverters

NETWORK TESTS

Solomon Power will initially assess all proposals for connection of inverter energy systems based on the following five network criteria being met:

Test 1 - 11kV Feeder Penetration Test for HV Voltage Regulation

That the addition of the proposed inverter system will not cause the total installed PV capacity on the 11kV feeder to exceed 15% of the 50% minimum feeder load (50% of the assumed minimum daytime load), such that the feeder does not enter export mode back to the 11kV zone substation bus.

Test 2 - Transformer Penetration Test for LV Voltage Regulation

That the addition of the proposed inverter system will not cause the total installed PV capacity off a **shared** transformer to exceed 25% of the transformer nameplate rating, reducing the probability of the transformer entering net export mode back onto the 11kV feeder.

Test 3 - Maximum Single Phase Inverter Test (Unbalance)

That the maximum single phase inverter size does not exceed 10% of the transformer nameplate rating (single phase transformers), or 8% of the nameplate rating (three phase transformers) This test is not applicable to three phase balanced inverters.

Test 4 - 11kV Feeder Voltage Fluctuation & Distortion Test

That the ratio S_i / S_{schv} is $\leq 0.1\%$

Where: S_i Three phase inverter rating (kVA)
 S_{schv} Three phase fault level at point of common coupling – 11kV (kVA)

(To minimise voltage disturbance to customers on same 11kV network.)

Test 5 - LV Feeder Voltage Regulation, Fluctuation & Distortion Test

That the ratio S_i / S_{sclv} is $\leq 1.0\%$

Where: S_i Three phase inverter rating (kVA)
 S_{sclv} Three phase fault level at point of common coupling – LV (kVA)

(To minimise voltage disturbance to customers on same low voltage network)

GENERATION TESTS

Solomon Power will then assess all proposals for connection of inverter energy systems based on the following criteria:

Test 1 – Minimum Generator Load Test

Minimum load test to ensure that no diesel engine operates at less than 40% of its nameplate loading while any solar system is operating.

Test 2 – Stability Test

Stability test to ensure that the sum total of solar inverter ratings connected to a system does not exceed 15% of the ratings of the diesel engines that are operating while any solar systems are operating. This test will be assessed at (G-1) operating conditions ie with the highest rating diesel engine out of service.

ASSESSMENT

Each application for connection of a solar PV array will be assessed against EACH of these criteria, and must pass ALL tests satisfactorily before approval.

Consideration can be given to reducing the approved inverter rating in marginal cases. See *Downsized or Declined Applications*.