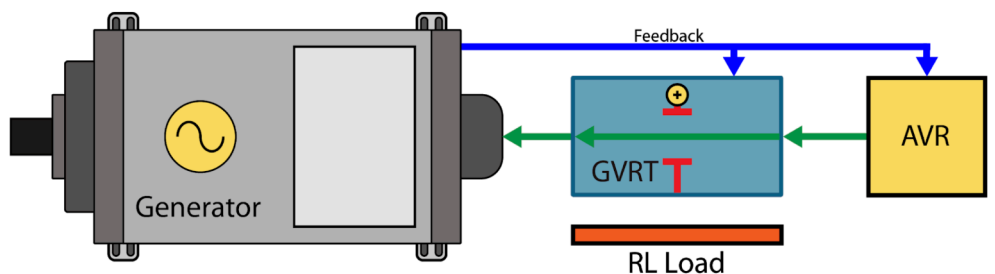# THE GVRT
GENERATOR VOLTAGE RESPONSE TESTER

OneStep Power Generator Voltage Response Tester (GVRT) allows for all excitation based testing, without the need to change protection system settings, in a controlled, repeatable manner.

- High speed networked generator control.
- Generates real time fault characteristics without risking equipment.
- Specific fault behaviours, proven through modelling to provide expected results prior to testing.
- Invisible to ship's systems, providing a true integrated system test.

How it Operates

Each generator in the power system under test will have a GVRT connected, these are then networked to a master control computer with high-speed time sync. Each GVRT is controlled by an onboard high-speed processor.

The GVRT is connected between the AVR and the field of the generator. The GVRT will measure readings such as voltage and current and has an internal load which allows the AVR to continue normal operation.


During normal operation the GVRT will mirror the AVR output, and in test conditions will vary the excitation voltage.
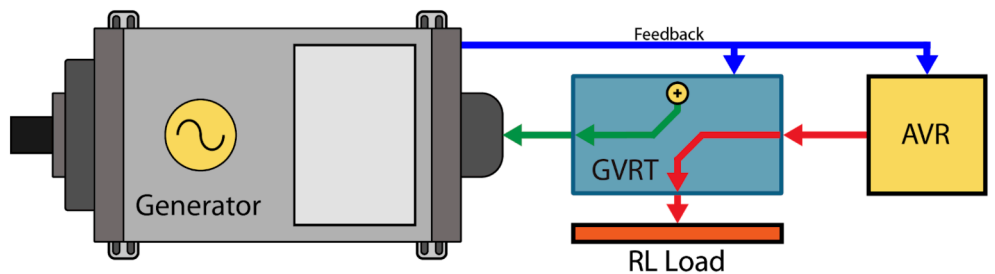
The tests are performed by OneStep's technicians using pre-programmed test sequences developed by OneStep's Power Engineers via the control computer, with high speed recording of results to provide actual wave-form responses.

ROBUST   RELIABLE   REPEATABLE

ONESTEP POWER
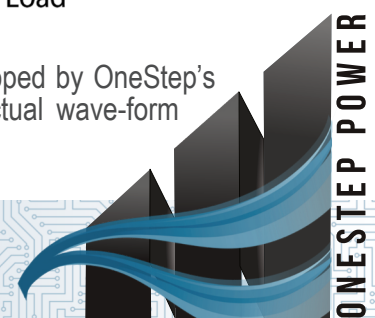
ROBUST
RELIABLE
REPEATABLE

Technology & Capabilities

The OneStep GVRT solution uses modern high-speed micro-processors and proprietary communications to ensure sub-cycle control of the generator exciter voltage. The GVRT system uses high-speed data capture to record power system responses and display actual real-time waveforms of fault conditions. This allows OneStep's Engineers to analyze actual responses and, in conjunction with previously agreed acceptance criteria, a non-negotiable "pass" or "fail" result with no interpretation required.

The GVRT can be used to test remote power systems with a range of specifications.

Parameter	UOM	Minimum	Maximum
Size of generator being controlled	MW	No Limit	No Limit
Specification of generator	-	AVR controlled	No Limit
Input Current	Amp	No minimum	5
Output Current	Amp	No minimum	25
Input voltage	Volts	110	690
Output Voltage	Volt	No minimum	100
Engine shut-down	Y/N	No minimum	Yes
GVRT Configurations *(Number of Generators which can be tested)*	Qty	1	10
Distance from GVRT to Control Hub	m	No minimum	100
GVRT Controlled generator voltage	% (System)	0%	120%

Benefits

Reduced risk - Testing without modifying systems settings.

Fast, Repeatable (Historical data), Reliable.

Safe testing of system response.

Safety Features

The greatest safety feature of the GVRT is the removal of personnel from the area associated with testing. In traditional power management testing scenarios, personnel are required to interact with live equipment. The GVRT eliminates this, making for a far safer testing solution.

During the GVRT test program all system protections will remain fully operational and no alteration or modification of internal protection and control system settings is required.

The GVRT is self-monitoring: any internal or external failure which could result in system damage will immediately de-excite the generator.

The GVRT is equipped with provisions for generator engine shut-down if specified by client. Minor failures (for example single board or generator failure) will be identified and selectively eliminated to reduce disruption.

Additional features include:

- Armoured and protected cabling between GVRTs and Hub, and suitable securing of cables as they pass along walkways and through doors.
- A control system which fails to "no-interaction", allowing the AVR to maintain control of the generator in the event of a GVRT failure.
- Software signals providing confirmation of timings of tests to ensure all systems are ready to operate and perform test as designed.
- Electrical isolation of the GVRT output (no direct path through from supply to field windings).
- Double confirmation on the activation of tests.

ROBUST   RELIABLE   REPEATABLE

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