

Frequency Response Auction Trial

Test Guidance for Low Frequency Static (LFS) Service

("Testing Guidelines")

Version: 1.2
Last Updated: 04/11/2019

Modification history

Version	Publication date and effective from	Summary of Change(s)
v1.0	03/04/2019	
v1.1	16/06/2019	<p>Pre-registration testing requirements section updated to include commercial.operation@nationalgrideso.com email address</p> <p>Progressing through the pre-qualification process with providers for the first auction indicated the need to increase the time period between providers submitting their testing data and entering into an auction on a Thursday, in order to ensure the process is smooth and sustainable for both National Grid ESO and the provider. Therefore, we have updated our testing guidance to request that all testing data is submitted a week ahead of the auction that providers intend to enter into (as opposed to 48 hours), but the earlier we receive testing data, the better.</p> <p>In the Contract Details section of Appendix C, we have updated the service type to LFS (Low Frequency Static) to avoid confusion.</p>
v1.2	04/11/2019	Additional information fields added to the test report.

Introduction

These Testing Guidelines describe the pre-registration testing requirements required for prospective response providers to demonstrate they can deliver the response being procured for LFS.

The Testing Guidelines shall be published and modified by or on behalf of NGENSO from time to time. The version of the Testing Guidelines which shall govern an Auction and a Related Balancing Services Document shall be the version prevailing at 12:00 hours fifteen (15) days prior to the Auction Opening Time in respect of the applicable Auction (clarifications are not included within this).

Any changes to these Testing Guidelines shall be communicated by NGENSO on its website. Where NGENSO also publishes a consolidated version of the Testing Guidelines showing changes made, the prospective response provider agrees and acknowledges that the consolidated version is an informal version of the changes and may not be relied upon in any way.

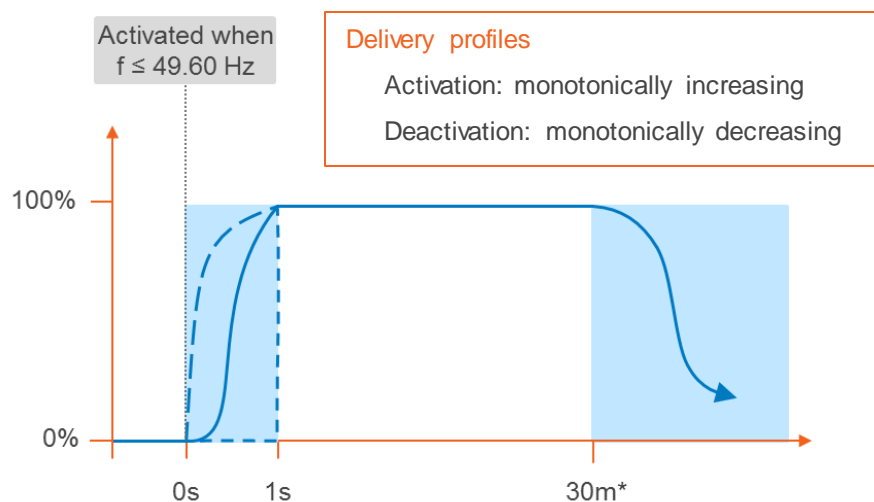
Pre-registration testing requirements

In order for the prospective response provider to complete the pre-registration requirement, the following information must be submitted to National Grid Electricity System Operator (NGESO) by no later than 13 working days prior to the Auction Opening Time:

- The test data, in the format outlined in Appendix A
- A Test Certificate from the ITE, in the format outlined in Appendix C
- A CV, setting out the qualifications and experience of the ITE.

Low Frequency Static (LFS) Service description

- Service activation at 49.6Hz
- Full response within 1 second
- Duration is 30 minutes for testing purposes. (Duration may be advised to be lower than 30 minutes ahead of each weekly trial).



Test Requirements

The non-dynamic low frequency (Low Frequency Static) test is designed to assess the capability of the provider to deliver the contracted Service described above.

The minimum sample rate for the Test is 10Hz. Simulations / simulated tests are not permitted. Each test submitted must record real time data from the plant and sites under test. The test data submitted must come from the specific site to be contracted; substituted data will not be accepted. See Appendix A for information on test signals.

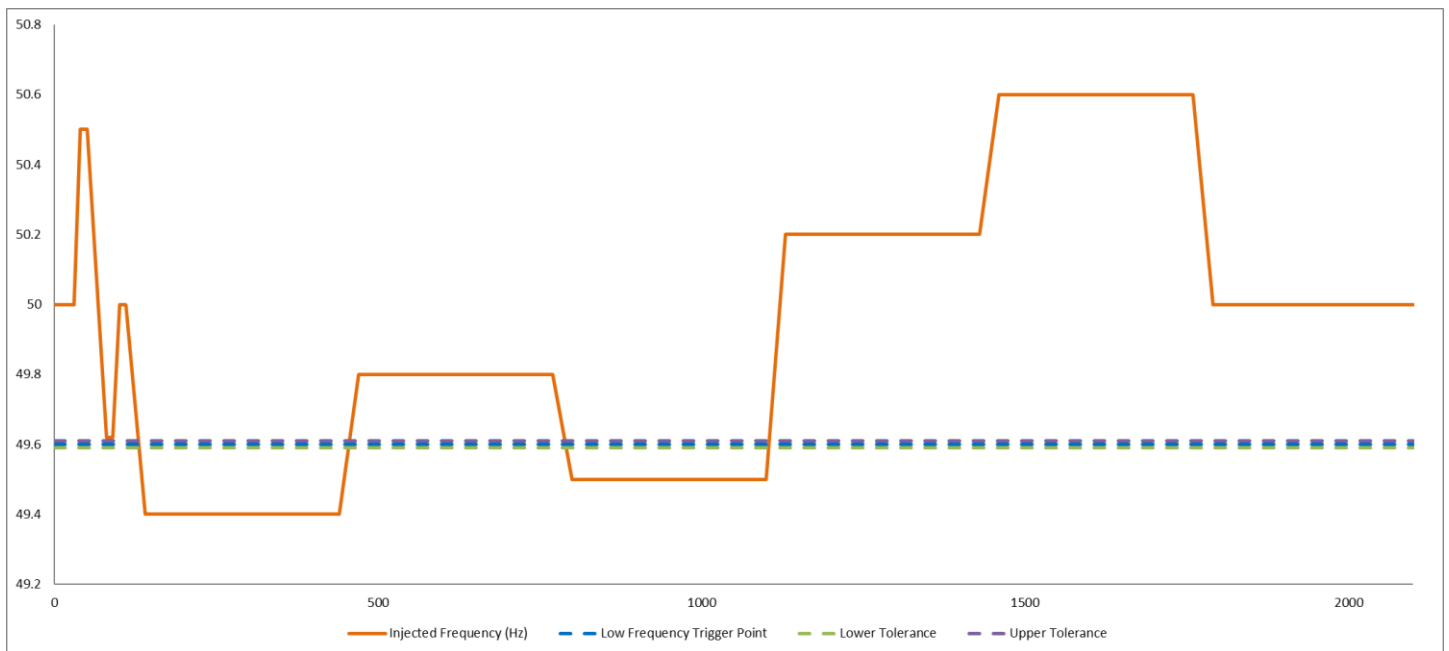
The pass criteria for the test are as follows.

- An acceptable frequency injection profile is used (see Table/Figure 1)
- The relay (or equivalent) activates at the correct contracted trigger frequency and within the permitted tolerance ($\pm 0.01\text{Hz}$)
- Sustain the response for the 30 minutes. Response volume is assessed as the minimum response observed from 1 second to 30 minutes following relay trigger.
- The standard deviation of active power error over a 30 minute period must not exceed 2.5% of the contracted active power change. (Standard deviation is calculated from 1 seconds to 30 minutes following relay trigger).

Table 1 - Injected Frequency against Time for Low Frequency Non-Dynamic Response Testing

Time (s)	0	30	40	50	80	90	100	110	140	440	470	770	800	1100	1130	1430	1460	1760	1790	2100
Injected Frequency (Hz)	50.00	50.00	50.50	50.50	49.62	49.62	50.00	50.00	49.40	49.40	49.80	49.80	49.50	49.50	50.20	50.20	50.60	50.60	50.00	50.00

Figure 1 - Injected Frequency against Time for Low Frequency Non-Dynamic Response Testing



Appendix A – Test Signals and Data Format

The data for the following signals will need to be provided

- a) Time
- b) Active power
- c) Injected frequency
- d) Relay logic – enter 1 for the period at which the relay triggers.

Data should be recorded for at least 30 seconds BEFORE the application of the frequency injection signal and for at least 30 seconds AFTER the completion of the test.

The data should be sent to National Grid ESO along with the ITE Test Certificate (Appendix C) described below.

Sample Test Data Format

Provider	Company Name			
Date	xx-xx-xxxx			
Test	1			
Service	Low Frequency Non-Dynamic Response			
Location	AA			
Site/Group/Plant	A			
Time	Injected Frequency (Hz)	Measured Power (MW)	Relay	
0	50.000	0.000	0	
0.1	50.000	0.000	0	
0.2	50.000	0.000	0	
0.3	50.000	0.000	0	
0.4	50.000	0.000	0	
0.5	50.000	0.000	0	
0.6	50.000	0.000	0	
0.7	50.000	0.000	0	
0.8	50.000	0.000	0	
0.9	50.000	0.000	0	
1	50.000	0.000	0	
1.1	50.000	0.000	0	
1.2	50.000	0.000	0	
1.3	50.000	0.000	0	
1.4	50.000	0.000	0	
1.5	50.000	0.000	0	
1.6	50.000	0.000	0	

Appendix B – Requirement for Test Certificate

For the purposes of this Appendix B, the following definitions shall apply:

Group means, for any person, another person who is the direct or indirect Holding Company of that person and any Subsidiary of that Holding Company. **Holding Company** means, in relation to a company, any other company in respect of which it is a Subsidiary.

Holding Company means, in relation to a company, any other company in respect of which it is a Subsidiary.

Independent Technical Expert means an experienced technical expert with expertise in the operation of DSR or generating units or electricity Interconnectors (as the case may be), Independent of the prospective response provider, engaged by the prospective response provider at its expense to carry out a technical assessment and prepare a Test Certificate.

Independent means, for any technical expert and the applicable prospective response provider, that the technical expert is: (a) not in the same Group as the prospective response provider; and (b) neither engaged on terms, nor party to any other arrangements, which could allow the prospective response provider or any member of its Group to exercise undue influence on any assessment of the Test Certificate prepared by that technical expert or otherwise compromise the objectivity of any such assessment and test certificate to the **Required Technical Standard**.

Required Technical Standard means, with respect to any assessment and Test Certificate prepared by an Independent Technical Expert that: (a) to the best of the Independent Technical Expert's knowledge and belief all information provided in it is accurate, complete and not misleading; and (b) any opinions or forecasts in the assessment have been conservatively prepared on assumptions which it considers to be fair and reasonable.

Test Certificate means a certificate in the form set out in Appendix C prepared by an Independent Technical Expert.

Subsidiary means a subsidiary within the meaning of section 1159 of the Companies Act 2006 (but relation to an Interconnector, or shareholder in such provider, subsection (1)(a) of that section shall apply as if a "majority of the voting rights" included 50% only of those rights).

The Independent Technical Expert will assess the response capability of the applicable asset in accordance with the testing profiles in Appendix A and shall prepare a Test Certificate for onward submission to NGENSO.

Appendix C

Please use this test certificate format and submit to NGENSO, along with the test data and CV of the ITE employed by the prospective response provider.

Prospective Response Provider Company Details

Prospective Response Provider Companyname
Companies House number
Primary contact name(s)
Contact number(s)
Email address(es)

Contract Details

Unique ID Code (provided by NGENSO)	
Service type	LFS
Asset owner	
Asset owner Companies House number	
Asset name	
Asset type: Generation/Demand/Both?	
Asset technology, e.g. diesel generator, battery etc	
Unit make up, e.g. single or aggregated	
Aggregation methodology (if appropriate)	
Address (including post code)	
Export/Import PAN/MPAN	
Asset contact details	
Test date	
Effective from date	

Static Service Details

Contracted response time	1 second
Contracted duration	30 mins
Trigger Frequency Setting	49.6Hz

Test Results

Pass Criteria	Pass / Fail	Comment
An acceptable frequency injection profile is used.	Pass / Fail	
The relay operating point of the plant/unit(s) occurs at the correct contracted trigger frequency and within the permitted tolerance ($\pm 0.01\text{Hz}$).	Pass / Fail	See Figure 1 for sample showing close up of the frequency at which relay operates
The response is sustained for 30 minutes.	Pass / Fail	
The standard deviation of active power error over a 30 minute period does not exceed 2.5% of the contracted active power change.	Pass / Fail	Insert test SD value here
Response volume is assessed as the minimum response observed from 1 second to 30 minutes following relay trigger	Pass / Fail	Can be shown in Figure 2 below.
Overall Test Result	Pass / Fail	<Confirm volume validated by test>

Figure 1 – Relay Operation (sample, to be replaced with test data)

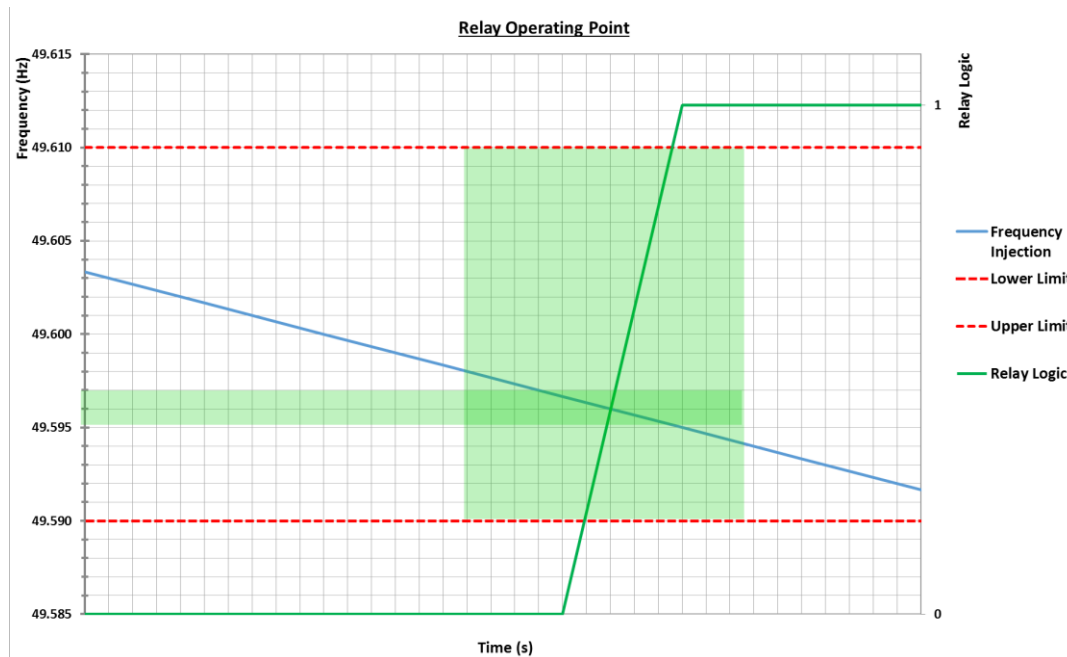
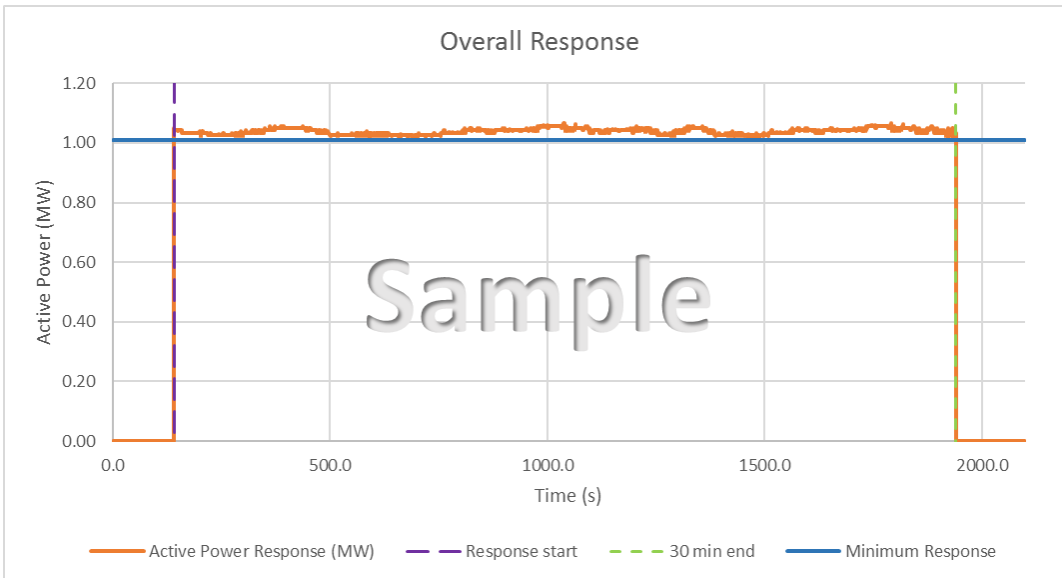


Figure 2 – Overall Response (sample, to be replaced with test data)



Independent Technical Expert (ITE) Details

Companyname

Primary contact name

Contact number /s

Email address

I / We confirm that I / We the following:

- (a) I/We am a/are Independent Technical Expert(s) (as defined in Appendix B of the NGENSO’s prevailing Testing Guidelines;
- (b) I/We have carried out an assessment of the [asset] described above in accordance with the testing guidelines set out in the Testing Guidelines;
- (c) the above details are, to my/our best knowledge and belief, true, accurate, complete and not misleading; and
- (d) the CV attached of my/our experience is to my/our best knowledge and belief, true, accurate, complete and not misleading.

Signed: