

# Frequently Asked Questions Stability Pathfinder - Phase 1

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# Frequently Asked Questions

## General

### **What service are you buying specifically** (last updated: 11 Nov)

We are seeking a stability service across GB with zero MW output. Stability includes inertia, dynamic voltage support and short circuit level contribution. More information on the capability required to provide this service can be found in Schedule E of the 'Stability Generic Contract Terms – Finalised', available [here](#). We are tendering for services commencing from as early as April 2020, running up to either 31<sup>st</sup> March 2023 or 31<sup>st</sup> March 2026. The latest service start date is 1<sup>st</sup> April 2021.

### **Who can participate in this tender?** (last updated: 11 Nov)

We invite tender submissions from providers which can meet the technical requirements for stability provision. Providers must be connected to the GB system at 132kV or above by 1 April 2021 and available for the remainder of the contracted period.

The timing and nature of our requirements for the stability pathfinder phase one are such that we need high confidence in service delivery. Therefore, for this exercise we will consider technology types proven for their capabilities to support our stability specification. The technology types we know to meet our specific requirements for readiness are:

- Synchronous compensators; and
- Synchronous generators running in a synchronous compensation mode

Phase two will facilitate a wider range of technology types.

### **Can I tender in multiple BMUs?** (last updated: 16 Dec)

Yes, a footnote was added to the 'Stability Generic Contract Terms – Finalised' (page 3) to provide for a contract adaptation to be made with applicable successful providers who have multiple BMUs at the tendered site.

### **Can a BMU with multiple modules tender one module in the stability service whilst participating in other markets with the remaining modules?** (last updated: 16 Dec)

No, this service will be contracted, controlled and monitored at the BMU level.

### **Can I substitute assets to provide the tendered service?** (last updated: 16 Dec)

Yes, a footnote was added to the 'Stability Generic Contract Terms – Finalised' (page 3) to provide for substitution.

### **Am I allowed to stack additional balancing services revenues if I'm successful?** (last updated: 16 Dec)

Providers can only stack additional balancing services provided that it does not impact the ability of the provider to deliver the contracted services if instructed to do so, unless per clause 19.1.3 of the 'Stability Generic Contract Terms – Finalised', NGENSO has agreed otherwise.

## Requirement

### **Can the provider commence service before 1<sup>st</sup> April 2021?** (last updated: 16 Dec)

Yes, services can commence between 1<sup>st</sup> April 2020 and 1<sup>st</sup> April 2021. All providers are expected to provide the service by 1<sup>st</sup> April 2021, however in the 'Stability Generic Contract Terms – Finalised' we have extended the 'grace period' under which we cannot terminate the contract, from 3 to 6 months in order to allow for any unforeseen delays.

### **If successful, what are the availability expectations within year?** (last updated: 16 Dec)

Successful providers will be expected to be available 24 hours a day year-round. However, the 'Stability Generic Contract Terms – Finalised' extended the annual allowance for planned and agreed outages from 5 calendar days to 15 calendar days.

**Why is this requirement for a 0MW service?** (last updated: 11 Nov)

We require incremental stability capability beyond that which can be currently accessed through the market or the balancing mechanism. We currently access stability capability by calling on synchronous generators to run through the balancing mechanism. To make room for this generation and balance the system we take actions to turn down non-synchronous generation. This process is expensive, and through these pathfinder tenders we are exploring whether there are more economic solutions available which have less of an adverse impact on the wider system.

Running synchronous generation to access stability in this way also has an impact on system operation. Having a large number of synchronous stations running at a low load, in turn impinges on our ability to access frequency and reserve services required for managing demand losses. This is increasingly challenging at times of low demand such as overnight and during summer.

## Technical

**What do you mean by 1.5pu short circuit level contribution?** (last updated: 11 Nov)

For a fault at the nearest transmission node (which could be the point of connection if it is transmission connected solution), short circuit level should be at least 1.5p.u of the machine rating across the time period of a fault.

**What do you mean by 1.5pu inertia contribution?** (last updated: 11 Nov)

Inertia is the stored energy which would be immediately injected into the system when there is a disturbance. The extent of a network disturbance will determine the amount of inertial response a machine will provide. By 1.5p.u, we mean an inertia constant (H) of 1.5s.

A machine with 100MVA rating with an inertia constant of 1s doesn't meet our requirement of 1.5p.u. This same machine if de-rated could meet the requirement.

**What do you mean by power oscillation damping capability?** (last updated: 11 Nov)

Similar to the function of a power system stabiliser in a synchronous generator which damps its oscillations and maintains its stability, a synchronous compensator must have capability to damp power system oscillations.

**What do you mean by 0.4p.u reactive range?** (last updated: 16 Dec)

We previously requested (in the Stability Generic Contract Terms – Draft) that the machine should be capable of providing reactive power injection and absorption of at least 0.4p.u of its machine rating in MVA. The 'Stability Generic Contract Terms – Finalised' have now removed this minimum requirement. Providers are now required to state their injection and absorption range in the tender pro-forma.

**What do you mean by a time constant of 12s?** (last updated: 11 Nov)

This refers to the damping time constant defined in the Security and Quality of Supply Standards (SQSS). The oscillation of the device should settle within the time constant of 12s (i.e. 15% or less of the original value left after 20s of the fault).

**What do you mean by withstand an initial RMS over-voltage of 1.4p.u?** (last updated: 11 Nov)

The machine should be capable of absorbing reactive current within 100ms of a fault clearance and not disconnect when voltage at its nearest transmission node reaches over-voltages of up to 1.4p.u.

**How is steady state MVar injection and absorption range defined where a plant has de-rated its MVA rating to meet the 1.5s inertia requirement?** (last updated: 16 Dec)

The steady state reactive support range is based on plant's capability (actual MVA rating). A provider should state the range which can be achieved at the Grid Entry Point (HV end of its connecting transformer).

**When operating in target voltage / MVar mode where should these targets be set?** (last updated: 16 Dec)

Both of these refer to the point of connection to the NETS.

**Does an existing plant connected with a tap-changing transformer as per the GB Grid Code need to provide V/Q slope characteristics?** (last updated: 16 Dec)

An existing plant connected via a tap-changing transformer can keep its existing control arrangement as per the Grid Code requirement. A new sync comp which may not have a tap-changer transformer will be expected to provide V/Q slope arrangements. Providers are encouraged to state which control strategy is being applied in their tender and we will reflect this arrangement in the successful provider's contract terms.

**When does the provider need to submit a power system model?** (last updated: 16 Dec)

NGESO will require a model prior to commissioning. Details of what the model should constitute are set out in Schedule E, part D of the 'Stability Generic Contract Terms – Finalised'.

**In Schedule E, Part B #11, is the 5-minute reference a maximum or absolute timeframe?** (last updated: 16 Dec)

It is a maximum timeframe.

## Commercial

**When does the contract need to be signed?** (last updated: 16 Dec)

Tenders are only valid if they have full board approval prior to submission. Following contract award, there is a period of 2 weeks for contracts to be signed by both parties.

**What is the contract length?** (last updated: 16 Dec)

Tenders are invited from providers who can be ready between 1<sup>st</sup> April 2020 and 1<sup>st</sup> April 2021. Contracts will run until either 31<sup>st</sup> March 2023 or 31<sup>st</sup> of March 2026. For the avoidance of doubt, providers are asked to tender for contracts ending in either 2023 and/or 2026 with no provision for bespoke contract end dates between 2023 and 2026.

**What is the payment structure?** (last updated: 16 Dec)

The tendered £/settlement period rate sets the availability payment for Financial Year 2020/21 and it is thereon inflated at CPI annually, on a financial year basis.

Reactive Power (leading and lagging – note, formulae in Schedule F (Payment section) have been corrected in the 'Stability Generic Contract Terms – Finalised') will be paid at the Reactive Default Payment Rate (ORPS) to Mandatory Services Agreement (MSA) holders, with non-obligated providers receiving a payment equivalent to ORPS. The ORPS rate is a varying monthly rate, details can be found [here](#).

Active Power consumed to provide the service will be reimbursed at imbalance rates (system buy price), up to the steady-state power requirements indicated in the tender proforma.

**How is unavailability defined?** (last updated: 16 Dec)

The service will be classed as unavailable for this service (and not therefore paid availability) if:

- The provider is exporting any Active Power (for whatever purpose), or
- The provider is importing any Active Power for purposes other than providing this service, or

- The provider declares themselves unavailable using the 'declaration of unavailability' proformas per Schedule H of the 'Stability Generic Contract Terms – Finalised', or
- The BMU is unable to provide the stability service (unless agreed and planned within the 15-calendar day annual outage allowance)

**How is unavailability treated?** (last updated: 16 Dec)

If a provider is unavailable (outside of the above outage allowance) during winter periods they will simply forgo availability payments. However, if a provider is unavailable during summer periods (1<sup>st</sup> April 2022 onwards) they will not only forgo availability payments but will additionally have to rebate us at the availability rate for the period concerned. We have introduced the rebate mechanism as a means to ensure that we gain incremental stability in summer periods where our needs are greatest.

On a monthly basis, rebates from previous months will be netted off payments due in-month. If the value of rebates due exceeds the value of payments due, then a zero payment will be made, and the remaining rebate rolled forward to the following month.

If at financial year-end rebates are outstanding, then we will raise an invoice for the remaining un-claimed rebate. This financial year-end invoice will however be capped such that total rebates over the financial year equal total payments made, taking the net payment to a minimum of zero per financial year.

Should the provider dispute any rebates or payments offset, then clause 14 of the 'Stability Generic Contract Terms – Finalised' sets out the process for managing such disputes.

**Why does the summer rebate mechanism only apply from 2022 onwards?** (last updated: 16 Dec)

Acknowledging that services can commence up to 1<sup>st</sup> April 2021, we felt it appropriate not to apply the rebate mechanism in the first summer period during which the 'grace period' applies.

**Why is the summer period defined as 7 months?** (last updated: 16 Dec)

Our needs are greatest between April-October and so we have matched the payment mechanism to these needs, rather than adopting any other reference point.

**How is underperformance treated?** (last updated: 16 Dec)

Unlike some other contracts, there is no 'performance factor' built into this contract. If the service is available (or within planned and agreed outage up to the annual 15 calendar day allowance), then the availability rate as described above will be paid in full.

However, if we observe poor performance, then we can request a re-proving test to establish whether the specified service is being provided.

**What agreements do I need to have in place with you?** (last updated: 16 Dec)

To partake in the tender, providers need to pass the technical requirements as summarised in section 3.2 (pages 17-20) of the Information to Tender (ITT) pack [here](#), and in further detail in Section E of the Stability Generic Contract Terms – Finalised [here](#).

Along with submission of the tender proforma, providers are required to provide project milestones that incorporate all of the 'Conditions Precedent' as summarised in section 5.3 (page 33) of the ITT pack and on page 3 of the Stability Generic Contract Terms - Finalised. As highlighted in the updated ITT pack published on the NGENSO webpage on 25<sup>th</sup> November, the requirement for non-generators to sign an MSA has been removed from the 'Stability Generic Contract Terms – Finalised'.

**Is a security deposit required as part of the tender?** (last updated: 16 Dec)

No.

## Assessment

### **How will I be assessed?** (last updated: 16 Dec)

The assessment will take the costs submitted along with the inertia provided, the reactive range, the location, the stability support provided, and the power consumed to create a price stack. Contracts will then be awarded until our requirement has been fulfilled.

All tenders are compared against the BM counterfactuals. NGESO is licensed to manage the system in an economic and efficient manner and the cost of the contracts will be compared with the historic cost of synchronising additional synchronous machines to provide inertia, foot room and headroom creation to allow these units to be synchronised, frequency response costs, voltage costs, curtailing of largest losses and bids and offers to maintain generation and demand balance.

The parameters used to assess the most economic and efficient tender are detailed on page 26 of the updated ITT pack available [here](#). The [Substation Effectiveness Weighting document](#) provides guidance as to which locations will be most effective for stability and voltage, however we can confirm that Inertia has the greatest weighting in the overall assessment.

### **What is the counterfactual for the assessment?** (last updated: 11 Nov)

All tenders are compared against a BM alternative i.e. the cost of solving this is the BM.

### **Why is the power consumption needed?** (last updated: 11 Nov)

We believe that all synchronous compensators or generators acting as synchronous compensators will require energy which will make them out of balance. We will pay the energy imbalance price multiplied by the MW offtake that is metered up to the power consumption in the tender bid. Therefore, we need to include this cost to come to a complete contract cost to compare against the alternative.

### **If you have a nationwide inertia requirement, why do we need to supply which substation we are connected to?** (last updated: 11 Nov)

There is no technical assessment as part of this procurement process, so we need to weight the effectiveness of the inertia depending on whether the synchronous compensator is connected at 400, 275 or 132 kV. Where potential solutions connected at 400kV will be rated the highest.

Our requirement for inertia is nationwide, but in the future, we anticipate that there may be a more localised stability need so would like these bids to show the benefit given.

A synchronous compensator will also support our reactive requirement, so assets located in regions will be weighted to show the cost benefit of this.

### **How are TO solutions going to be assessed?** (last updated: 11 Nov)

This assessment methodology is provider agnostic. If a solution is submitted by an existing Transmission Owner via the regulated route, the assessment will assume that the total costs of the assets will be recovered over the contract length when determining a £/settlement period rate. Transmission owner assets and other commercial providers will be assessed on parity using a cost per settlement period basis.

### **How does the all or nothing process work in the tender assessment?** (last updated 16 Dec)

We anticipate some providers will provide multiple tenders – for different sites, so want to understand whether they wish them to be considered all together or separately.

## Monitoring and Testing

### **Will I be subjected to an initial proving test?** (last updated: 11 Nov)

Parties will be tested prior to service delivery and the ESO must be satisfied with the outcome before the service commences. The nature of the test will depend on the specific solution and

build programme, but some examples of the types of test are provided in Schedule D of the Stability Generic Contract Terms – Finalised [here](#).

**What are the potential consequences from the initial proving test?** (last updated: 11 Nov)

The successful passing of the initial proving test forms part of the ‘Conditions Precedent’ which need to be fully met before service can commence.

If deemed necessary, we may install monitoring equipment at the provider’s facility to track performance levels.

**Will further proving tests be required during service delivery?** (last updated: 16 Dec)

We have the right to undertake proving tests up to twice per year in order to ensure the service is performing as expected. Further details are provided in Section 5 (page 8) & Schedule D (page 39) of the Stability Generic Contract Terms - Finalised [here](#).

**Who pays for these tests?** (last updated: 11 Nov)

Each party is responsible for covering the costs associated with undertaking / facilitating both the initial and any in-delivery proving tests. The costs associated with monitoring equipment will however be fully borne by us.

**Can ESO provide more guidance on testing?** (last updated: 16 Dec)

We expect most of the technical requirements in the commercial contract to be demonstrated under Grid Code compliance for most providers. In cases where the commercial contract requirement is beyond the Grid Code requirement for a provider, we expect additional testing (physical or desktop simulations). Tests will be similar to the existing compliance tests for synchronous generators and will need to be completed ahead of service provision.

**If a synchronous compensator is reverted to a generator, what Grid Code compliance would apply?** (last updated: 16 Dec)

The degree of compliance testing required is dependent on the amount of modification which has taken place. For example, if there has been no change to the excitation system and/or governor system from the current accepted “compliant” position then any testing would be limited to a repeat of a very few of the last tests on file to demonstrate the excitation and governor system are behaving as before. However, if the excitation system or governor system has been changed, the normal compliance process would be triggered to ensure that the changed element of the plant still meets GB Grid Code compliance.

If the existing compliance testing does not demonstrate compliance with a commercial contract requirement (that goes beyond the grid code requirement) then additional testing will be required.

**Do existing plants need to comply with the European Connection Code (ECC) if they are already compliant with the Connection Code clauses of the Grid Code (CC)?** (last updated: 16 Dec)

Yes, additional evidence of compliance to meet the commercial contract requirements set out in Schedule D of the ‘Stability Generic Contract Terms – Finalised’ (where the ECC is referenced) will be required if different from the respective CC clauses.

## Dispatch

**How do I declare whether I’m available or not?** (last updated: 16 Dec)

Providers are assumed available unless the provider submits a declaration (via fax) of unavailability, as soon as they become aware. Providers must submit (via fax) a redeclaration of availability once they are available again. The forms for declaring un-availability and restoration of availability can be found in Schedule H (page 52) of the Stability Generic Contract Terms - Finalised [here](#).

**How will the service be dispatched?** (last updated: 12 Nov)



We will instruction the provider via EDL/EDT communications which the provider needs to be able to receive.

## Settlement

**How will my performance be monitored?** (last updated: 11 Nov)

We will be monitoring performance using data from EDL/EDT.

**How will I be paid, and how often?** (last updated: 12 Nov)

Payment terms are outlined above and specified in Schedule F (page 45) of the Stability Generic Contract Terms - Finalised [here](#).

Payments will be paid through the normal monthly settlement process and paid a month in arrears. So, for service delivery in April 2020, you will be paid in May 2020 and so forth.

## Embedded providers

**I'm connected below 132kV, can I participate?** (last updated: 11 Nov)

Providers connected below 132kV cannot participate in this tender. The effectiveness of solutions decreases as solutions are located at lower voltage levels.

**Do I need to notify the DNO I want to tender / have tendered in?** (last updated: 11 Nov)

Yes, if you are or will be connected to the system via a distribution network you should check with your DNO whether there are any restrictions which could impact your ability to provide this service.

## Connection Agreements

**How do I know where I am connected / connecting?** (last updated: 11 Nov)

You should contact the relevant transmission network owner for connection to the transmission system. National Grid Electricity Transmission for your connection to the England & Wales transmission network, Scottish Power Transmission and Scottish Hydro Electric Transmission for Scotland. For 132kV in England and Wales, you should contact the relevant DNO. You can identify your DNO via the ENA's website [here](#).

**Will an existing provider need a modification application to provide this service?** (last updated: 16 Dec)

A modification application is required when a customer makes a change classed as significant and might require contract amendments and/or study work from the TO. The most common reasons for modification applications are changes in capacity, connection dates, technology type or significant changes in DRC data including control systems that would prompt additional study work. Providers are encouraged to speak to their NG ESO connections account manager to determine if changes are required for their facility.