# Firm Frequency Response Market Information for Nov-16

Monthly Report

**Published Sep-16**

**Please note that we are constantly making changes to this report and as a result the content and requirements may change on a monthly basis.**

## Key points

This Market Information Report is relevant for tenders submitted in **Oct-16** for delivery **between Nov-16 and Apr-17**

Tenders from eligible service providers for Firm Frequency Response should be submitted by **Mon 03-Oct-2016** (1st business day) for all tenders.

National Grid will notify service providers of the outcome of the tender assessment, and preliminary nominations, by **Tue 18-Oct-2016** (12th business day).

### Notes:

We will be limiting contracts to 6 months ahead of tender month only and a maximum of two years in duration. Therefore tenders should not start later than April 2017. Also tenders must be for existing assets.

A number of changes have been made to the report including data used within all graphs and the removal of the 12 month volume table as the graphs have been changed to show requirement by settlement period.

## Introduction

Firm Frequency Response (FFR) is the firm provision of Dynamic or Non-Dynamic Response to changes in Frequency. Unlike Mandatory Frequency response, FFR is open to BMU and non-BMU providers, existing Mandatory Frequency Response providers and new providers alike. National Grid procures the services through a competitive tender process, where tenders can be for low frequency services, high frequency services or both.

Submitted prices are compared to the costs of alternatives to deliver the equivalent level of frequency response. More detail can be found in the assessment principles, the link can be found below.

This report provides information to current and potential providers about the volume of, and time periods over which, we are seeking to contract for frequency response services.

## Highlights

In Sep-16, we received 266 FFR tenders from 32 units. More details on the tenders accepted/rejected are available from the post-assessment tender report.

We recognise that a number of providers use FFR to invest in new assets and we are currently looking at ways to facilitate this and so focussing the FFR market on a maximum 6 month delivery date from tender month. Also tenders must be a maximum of 2 year duration from this date.

Response requirements are defined in terms of services that provide a full frequency range **Dynamic** service and services providing a frequency set-point triggered response service referred to as **Static**). The key principal of the Dynamic service is continuous delivery at frequencies near 50Hz to help maintain stable steady state frequency (pre-fault). Static services typically have a frequency trip point that is far enough away from 50Hz to be considered post event response. In order to control steady state frequency a certain volume of Dynamic response is required, this is referred to as the **Minimum Dynamic** requirement**.** Dynamic units as described above can be used to meet the full response requirement but Static units cannot meet the Minimum Dynamic requirement.

## Links

Assessment Principles and Post-Assessment Tender Reports
http://www.nationalgrid.com/uk/Electricity/Balancing/services/frequencyresponse/ffr/

The Monthly Balancing Services Summary (MBSS) gives a monthly summary of the cost of services procured by service
http://www2.nationalgrid.com/UK/Industry-information/Electricity-transmission-operational-data/Report-explorer/Services-Reports/

# Nov-16 Dynamic Requirement

The three charts on this page display the volume of frequency response to contract for the month ahead from **Dynamic** services. The blue bars represent existing contracted service provision including any optional non-FFR services routinely used that NG forecast to be cost effective for the month ahead.

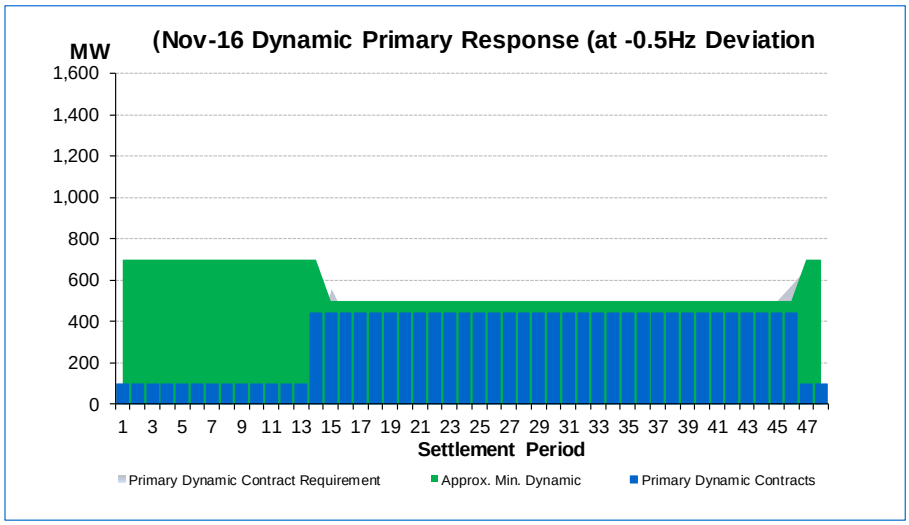
The green shaded area represents the Minimum Dynamic Requirement.

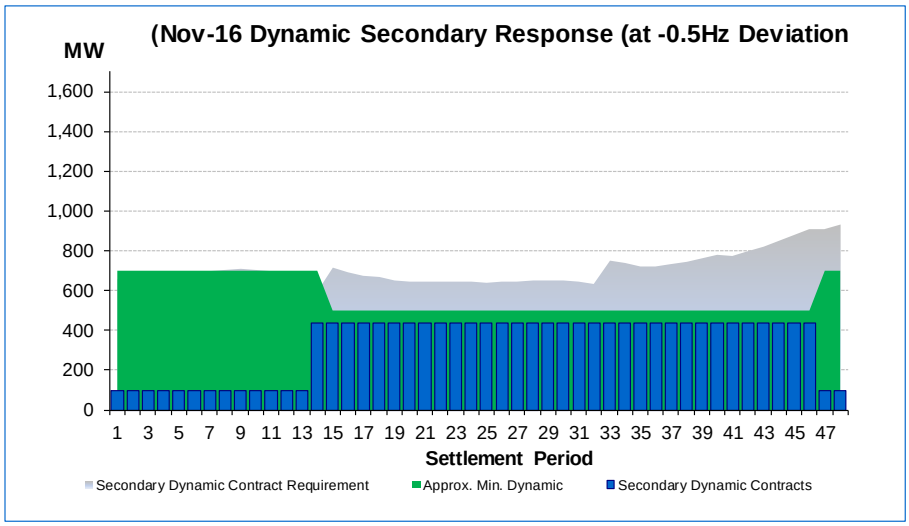
The blue/grey shaded area is the remaining volume to contract. This volume can be met from Dynamic or Static providers. As such this volume also appears on the frequency set point charts on the next page.

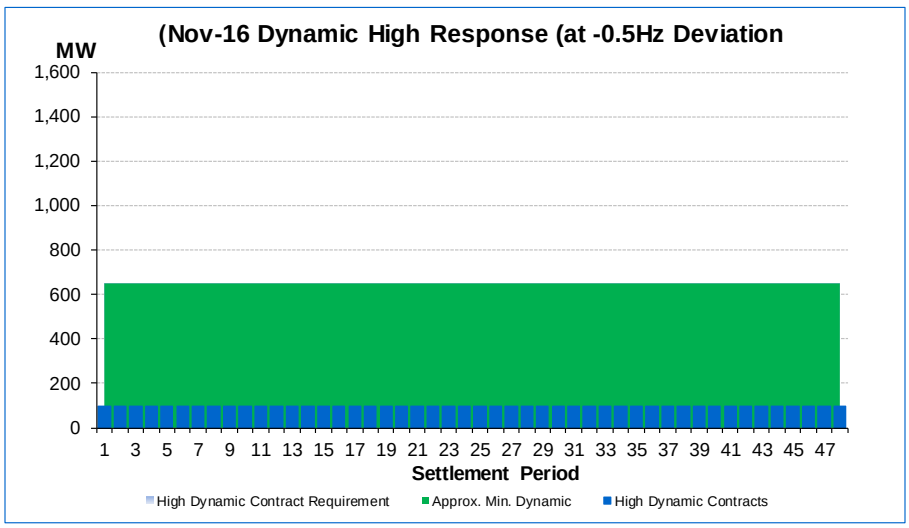
Please note that the top line is not necessarily the total response requirement because volumes of Static services have been removed.

These charts represent a forecast average baseline requirement that NG would look to fill by contracting at month ahead. The actual requirement in real time will vary. Optional services and Mandatory Frequency Response will be used to make up any shortfall between contracted and real time requirement.

The approximate Minimum Dynamic Requirement is shown as well as the total response requirements.



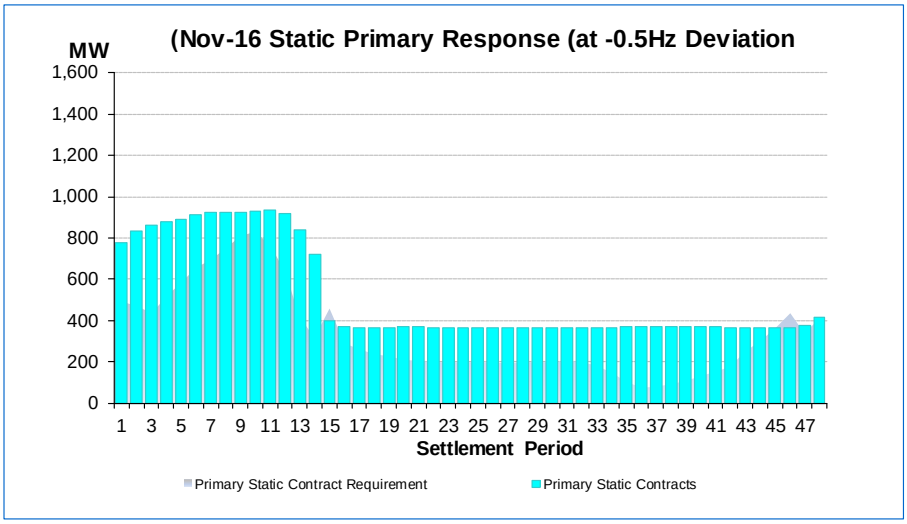
# Nov-16 Static Requirement

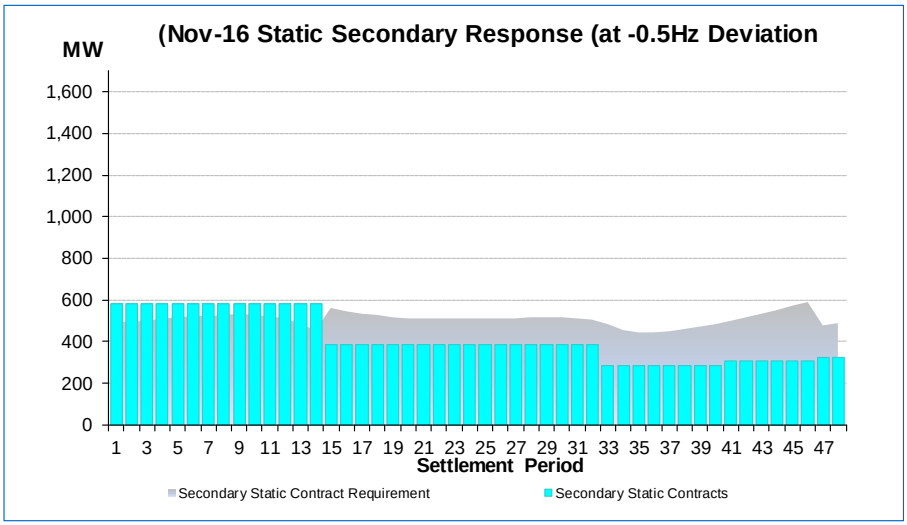
The three charts on this page display the volume to contract for **Static** response services.

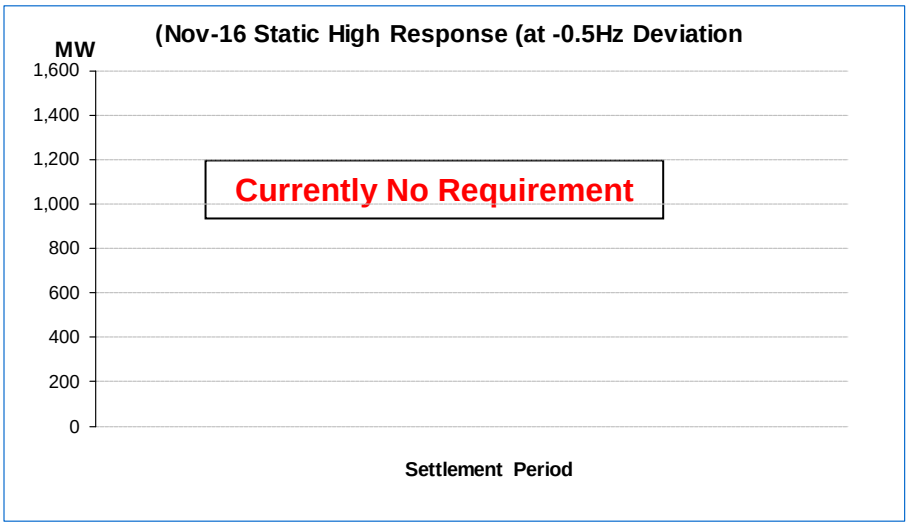
Static, or post-fault, response can be used to displace the non-Minimum Dynamic proportion of the response requirements. The volume to contract is the same volume that is displayed on the Dynamic service charts above. Either service can provide the volume.

The light blue bars represent the existing contracted volume including any routinely used optional services that NG expects to be in merit in the stack for the month ahead.

The frequency response requirements are calculated to ensure sufficient response capability to contain frequency to within certain limits following a specified size of generation or demand loss. One of the assumptions used is that the starting frequency when the loss occurs is 0.1Hz away from 50Hz. The requirement is calculated assuming a generic response profile from a Dynamic service as typically provided by the Mandatory response service. At 0.1Hz deviation a dynamic provider will have already delivered part of their response capability whilst a Static provider with a frequency trigger at >0.1Hz will not have delivered anything. This means that a Static provider can offset slightly more of the non-Minimum Dynamic requirement than a Dynamic provider of the same size. The requirement shown on the chart has therefore been adjusted to display the MW of static capability that could offset the response requirement.




## Key points

The response requirement for secondary is the largest of the 3 static requirements.

There is currently no requirement for high static response due to the minimum dynamic requirement also being sufficient to secure for the normal demand loss.

# FFR Market Information

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## Frequency Set-Point Triggered Services

The semi-dynamic service as detailed in previous reports is currently under review. We are currently evaluating the volumes and technical requirements of semi-dynamic services appropriate to the FFR market.

We are currently carrying out detailed analysis that will give clarity on the requirements, compliance and testing to ensure the output of this type of service meets future operability requirements.

We are not accepting further semi-dynamic tenders until further notice as we have met the initial volume requirement. Any previously awarded contracts will not be withdrawn but will be effective as per agreed dates of the respective contracts. More information on this will be provided in subsequent reports.

Our focus for FFR will be on dynamic and static response services. Static refers to services where full output is achieved after actuation at trigger frequency where delivery of the service continues up to 30mins.

## What we are looking to Procure in the Short-Medium Term

This section aims to detail what we are looking to procure in the next months:

- **Dynamic Response:**
    1. There is a requirement for overnight dynamic Primary response.
    2. We would like to procure more Secondary all day response, where there is more value during the day and so we value daytime tenders.
    3. We need High response throughout the day to meet our minimum dynamic response, however there is more value in this service overnight due to footroom savings and so we would also consider overnight only tenders.

- **Static Response:**
    1. There is currently no requirement for Primary and High static response.
    2. There is a requirement for static Secondary daytime response. A longer duration, covering whole daytime periods would be more beneficial as we are trying to avoid a spikey response contracted profile. , In order to cover the 1 – 3 hour period of response provision the ENCC has to procure additional energy to cover the before and after periods which sterilises the benefit of these tenders.

- All day response is 24 hours; Daytime is approximately between 07:00 and 23:00 and overnight is between 23:00 to 07:00.
- We are not looking to procure any services that start more than 6 months ahead of the tender month at this moment in time, via the FFR monthly tender round. Due to uncertainties in the future markets and the risks that this holds for us, we are aiming to clarify our long term procurement plan over the coming months.
- In all our assessments we look to procure contracts that have the most economic benefit against alternative costs and so what was accepted one month may not be the next depending on our forecasts of the alternative costs.

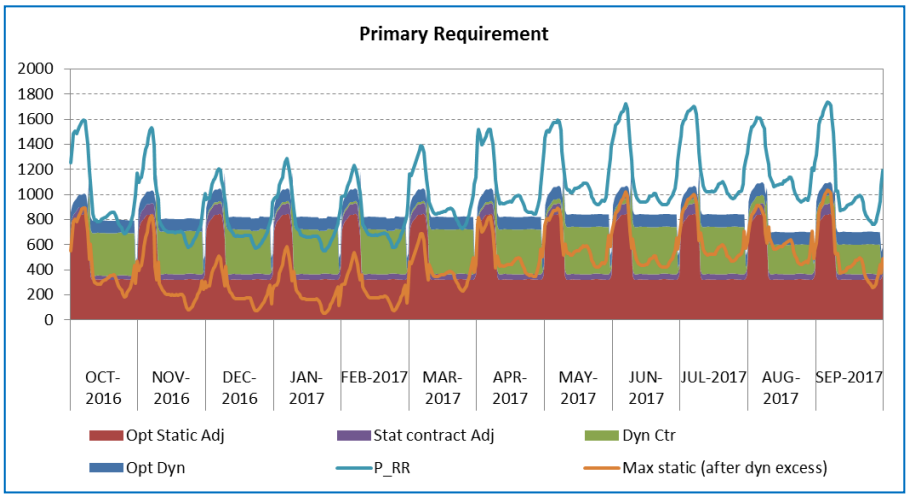
If you have any queries, suggestions or feedback on the content or format of the new report please contact your account manager or steve.k.miller@nationalgrid.com

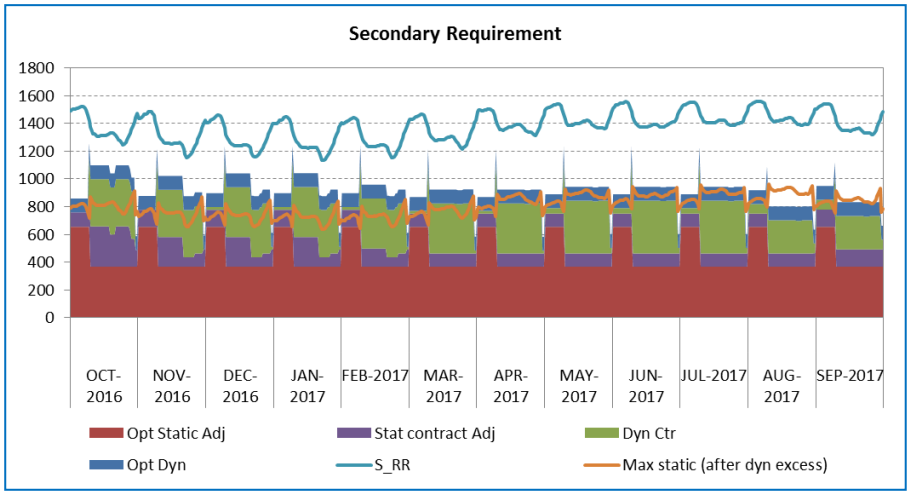
# 12-Month Total Requirement

**Please note that these graphs are reviewed regularly and may change month on month.**

The following charts show the total requirement (blue line) over the next 12 months. The charts provide an estimate of the response requirements by settlement period. This also includes current contracts and optional services. These are bilateral contracts with no upfront fees for providing the service. Historically they have been the lowest cost option compared to most tenders therefore they are instructed and also included in this report.

Static can be contracted up to the orange line and so we can see there is little requirement for secondary static overnight until August but there is a large daytime requirement. Dynamic can be procured up to the blue line on each graph where we can see there is larger overnight requirement.



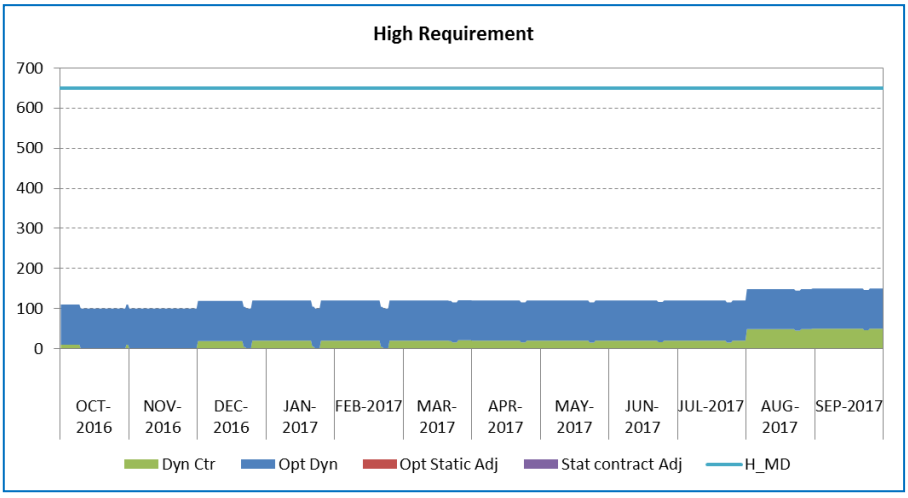

## Key points

The response requirement is greater during the summer than winter.

The response requirement is greater overnight than during the daytime

The primary and secondary response requirements are greater than the minimum dynamic throughout the year. A static response service could therefore be beneficial in meeting the total requirement.

For High frequency response, the minimum dynamic response is greater than the requirement throughout the year. A static response service would not be beneficial in meeting the requirement.



# Contract Requirement Volume Tables

**Nov-16 requirement -** Volumes left to procure as shown in the charts on page 2 and 3

| | Static Amount required (MW) | | |
|---|---|---|---|
| SETT_PERIOD | Primary | Secondary | High |
| 1 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 |
| 12 | 0 | 0 | 0 |
| 13 | 0 | 0 | 0 |
| 14 | 0 | 0 | 0 |
| 15 | 0 | 168 | 0 |
| 16 | 0 | 145 | 0 |
| 17 | 0 | 127 | 0 |
| 18 | 0 | 118 | 0 |
| 19 | 0 | 105 | 0 |
| 20 | 0 | 100 | 0 |
| 21 | 0 | 99 | 0 |
| 22 | 0 | 98 | 0 |
| 23 | 0 | 97 | 0 |
| 24 | 0 | 96 | 0 |
| 25 | 0 | 94 | 0 |
| 26 | 0 | 96 | 0 |
| 27 | 0 | 100 | 0 |
| 28 | 0 | 101 | 0 |
| 29 | 0 | 160 | 0 |
| 30 | 0 | 162 | 0 |
| 31 | 0 | 158 | 0 |
| 32 | 0 | 143 | 0 |
| 33 | 0 | 55 | 0 |
| 34 | 0 | 16 | 0 |
| 35 | 0 | 0 | 0 |
| 36 | 0 | 0 | 0 |
| 37 | 0 | 8 | 0 |
| 38 | 0 | 21 | 0 |
| 39 | 0 | 38 | 0 |
| 40 | 0 | 59 | 0 |
| 41 | 0 | 78 | 0 |
| 42 | 0 | 101 | 0 |
| 43 | 0 | 156 | 0 |
| 44 | 0 | 244 | 0 |
| 45 | 0 | 272 | 0 |
| 46 | 0 | 300 | 0 |
| 47 | 0 | 213 | 0 |
| 48 | 0 | 235 | 0 |

| | Dynamic Amount required (MW) | | |
|---|---|---|---|
| SETT_PERIOD | Primary | Secondary | High |
| 1 | 336 | 573 | 540 |
| 2 | 263 | 574 | 540 |
| 3 | 199 | 582 | 540 |
| 4 | 260 | 594 | 540 |
| 5 | 317 | 604 | 540 |
| 6 | 372 | 608 | 540 |
| 7 | 399 | 615 | 540 |
| 8 | 454 | 622 | 540 |
| 9 | 511 | 625 | 540 |
| 10 | 527 | 624 | 540 |
| 11 | 459 | 614 | 540 |
| 12 | 345 | 597 | 540 |
| 13 | 206 | 556 | 540 |
| 14 | 135 | 115 | 540 |
| 15 | 135 | 228 | 550 |
| 16 | 0 | 205 | 550 |
| 17 | 0 | 187 | 550 |
| 18 | 0 | 178 | 550 |
| 19 | 0 | 165 | 550 |
| 20 | 0 | 160 | 550 |
| 21 | 0 | 159 | 550 |
| 22 | 0 | 158 | 550 |
| 23 | 0 | 157 | 550 |
| 24 | 0 | 156 | 550 |
| 25 | 0 | 154 | 550 |
| 26 | 0 | 156 | 550 |
| 27 | 0 | 160 | 550 |
| 28 | 0 | 161 | 550 |
| 29 | 0 | 220 | 550 |
| 30 | 0 | 222 | 550 |
| 31 | 0 | 218 | 550 |
| 32 | 0 | 203 | 550 |
| 33 | 0 | 115 | 550 |
| 34 | 0 | 76 | 550 |
| 35 | 0 | 57 | 550 |
| 36 | 0 | 60 | 550 |
| 37 | 0 | 68 | 550 |
| 38 | 0 | 81 | 550 |
| 39 | 0 | 98 | 550 |
| 40 | 0 | 119 | 550 |
| 41 | 0 | 138 | 550 |
| 42 | 0 | 161 | 550 |
| 43 | 0 | 216 | 550 |
| 44 | 8 | 304 | 550 |
| 45 | 70 | 332 | 550 |
| 46 | 148 | 360 | 550 |
| 47 | 577 | 813 | 540 |
| 48 | 610 | 835 | 540 |