NATIONAL GRID

Ancillary Service Settlement Guide

Short Term Operating Reserve (STOR)

Version 1

December 2009

CONTENTS

1 INTRODUCTION

This guide has been written for providers of ancillary services. It describes the Short Term Operating Reserve (STOR) service, the data required to calculate the payments for delivering the service and the various reasons for non-payment. It then gives details of the reports (backing sheets) which accompany the monthly statements and payments.

Further details on the STOR service can be found on the Balancing Services page of National Grid's website: http://www.nationalgrid.com/uk/Electricity/Balancing/services/

If you have any queries or comments on this guide, please contact the settlements team at settlements.queries@uk.ngrid.com or 01926 654613.

2 THE STOR SERVICE

At certain times of the day National Grid needs access to sources of extra power, in the form of either increased generation or demand reduction, to be able to deal with actual demand being greater than forecast demand and/or unforeseen generation unavailability. These additional power sources which are available to National Grid are referred to as 'Reserve' and comprise synchronised and non-synchronised sources. National Grid procures the non-synchronised requirement primarily by contracting for STOR.

Standing Reserve (the service that preceded STOR) was designed to allow for sufficient short-notice providers to be available to secure the system following generation loss and unforeseen changes in demand within 20 minutes.

STOR was developed taking into account the fact that potential reserve providers existed who could not meet the 20 minute response criterion but who could still be of value in meeting National Grid's Reserve requirement. The response time service criterion was therefore extended from 20 to 240 minutes.

2.1. Committed and Flexible Services

Short Term Operating Reserve (STOR) is a Reserve service that provides additional active power by way of increased generation and/or demand reduction. There are two forms of STOR service; Committed and Flexible.

If service providers contract with National Grid to provide the Committed service, they should be able to provide the service for all 'windows' for the term of their contract. Both BM and non-BM providers can offer the Committed service.

The Flexible service is open to non-BM service providers only. Flexible service providers have greater freedom as they can nominate which windows they wish to make themselves available for.

2.2. Who Can Provide STOR

Generators and demand users may provide the STOR service. The main criteria are that STOR providers must be able to;

- Offer a minimum of 3MW or more of generation or steady demand reduction (this can be from more than one site)
- Deliver contracted MW within 240 minutes or less from receiving instruction
- Provide contracted MW for at least 2 hours when instructed
- Have a recovery period after utilisation of not more than 1200 minutes (20 hours)

- Be able to provide STOR at least three times a week

2.3. Contractual Framework

In order to be able to tender for the service National Grid and the prospective service provider must enter into a STOR Framework Agreement. The STOR Framework Agreement will list the units/sites that a service provider may wish to tender at some stage in the future. Tenders may only be submitted in respect of the units/sites listed in the STOR Framework Agreement.

2.3.1. Tendering

STOR is procured via a competitive tender process with three tender rounds per year. The standard contract terms are published on National Grid's website along with tender round dates and tender documentation.

The service provider will be required to submit;

- Availability by season
- Dynamic/Technical service parameters
- Availability and Utilisation prices
- Type of Service (Committed/Flexible)
- How the service will be supplied
- Whether they are a BM or NBM provider

Tenders are then assessed by National Grid and either accepted of rejected in accordance with the Assessment Principles published on the Balancing Services website.

2.4. Availability Windows

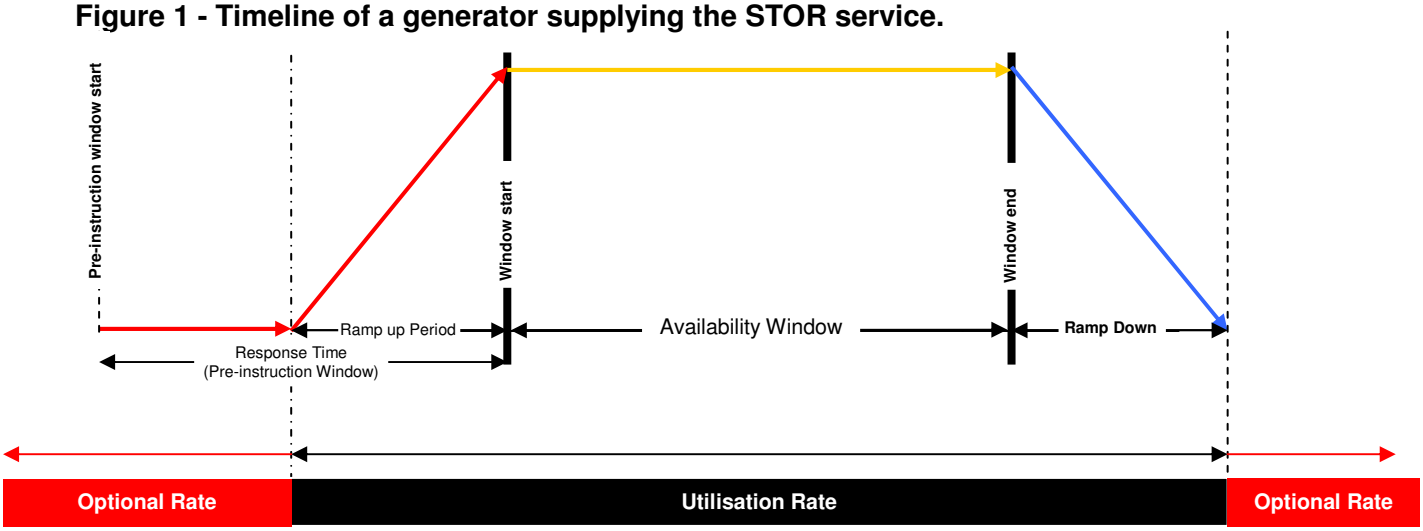
The need for STOR varies across the time of the year, the time of week and the time of day. To reflect this varying requirement, National Grid splits the year into six seasons. Each season is split further into working days (WD) and non-working days (NWD). National Grid then specifies the settlement periods for which STOR is required within each type of day (WD/NWD) for each season. These periods are referred to as availability windows. Appendix 1 shows an example of the windows in each type of day for each season of a term. The dark blue areas represent contracted windows.

Under the STOR contract the service provider must be able to achieve its contracted MW by the time the contracted Availability Window starts. To do this the service can (if required) be instructed before the contracted window - at the start of what is called the 'pre-instruction window'. The pre-instruction window start time will be different for each provider and is calculated as the contracted window start less the specific unit/site's contracted response time. See figure 1 for a diagram showing this.

The unit will begin to supply the service at the start of the ramp up period.

On receipt of a cease instruction from National Grid the unit will begin to ramp down (i.e start to cease provision of the service and return to its pre-instructed MW).

Figure 1 - Timeline of a generator supplying the STOR service.



3 PAYMENT CALCULATIONS

National Grid makes payments to NBM units/sites for STOR service availability and utilisation (delivery). As BM units/site are remunerated through the Balancing Mechanism, National Grid pays for their availability only. However, BM unit/site utilisation is monitored to apply any delivery related Events of Default (EoDs).

For a full description of BM and NBM EoDs please refer to the National Grid website, see link below and select the **STOR Events of Defaults** link in the **Related Documents** section;

http://www.nationalgrid.com/uk/Electricity/Balancing/services/settlement/

3.1. Data Required for Settlement

The data required for the settlement of BM and NBM STOR providers is not only different but is retrieved from separate sources. Before it is possible to calculate payments, National Grid needs to determine information such as contracted position, unit/site limitations and actual metering. In order to do this the following files are required, 3.1.1 describes the key data required for a BM provider and 3.1.2 describes key data for NBM providers.

3.1.1. BM providers

File	Description	Source
SAA_IO14 (.dat file)	*SPOT FPN data* – what the unit plans to do, looks at every point at which the profile changes *FPN half hourly date* – FPN volume per settlement period *BOA half hourly (bid offer acceptance)* – half hourly instructed volume per settlement period *Bid Offer Price & Volume* – Submitted prices and volumes for BO pair number 1 *QMij* – metered volume per settlement period *QMEij* – expected metered volume per settlement	**SAA (Logica)**

File	Description	Source
	period *MEL* – maximum export limit	
MNZT_(.dat file)	*Minimum non-zero time (MNZT)* – is the minimum duration of a bid-offer acceptance.	**BMRA (Logica)**
MZT_(.dat file)	*Minimum zero time (MZT)*- is the minimum time following the end of a BOA before another BOA can be instructed i.e. Recovery Period/Recovery time	**BMRA (Logica)**
NDZ_(.dat file)	Notice to deviate from zero (NDZ) – is the period of time for a unit to synchronise with the National grid System and start to generate.	**BMRA (Logica)**
RURE_(.dat file)	Run up rate export (RURE) – Is used to determine how long it will take unit to get to it's contracted MW	**BMRA (Logica)**
SEL_(.dat file)	Stable Export Limit (SEL) – Minimum stable generation of the unit	**BMRA (Logica)**
RDRE_(.dat file)	Run down rate export (RDRE) – enables the time for the unit to return to zero MW to be computed	**BMRA (Logica)**
Week ahead notification	Availability data is obtained from OC2 or via fax and this is used to create a week ahead availability file for BM providers.	**Control Room Fax**

3.1.2. NBM Providers

File	Description	Source
RES_WA_SRD_(.csv file)	Week ahead availability declaration as at 10:00 am on Friday	**SPSRD**
MAN_REJECT. (.dat file)	A file identifying whether availability has been accepted or rejected for each flexible provider	**SORT**
RES_AVAIL. (.dat file)	Availability is declared /re-declared by 17:00 day -1	**SPSRD**
RES_REDEC. (.dat file)	Re-declarations of availability after 17:00 (day -1)	**SPSRD**
RES_INSTRUCT. (.dat file)	STOR utilisation instructions issued by National Grid	**SPSRD**
RES_METERING_(.dat file)	Minute by minute metering data	**SPSRD**

3.2. Payment Types

There are two types of payment; availability and utilisation (also known as delivery).

3.2.1. Availability Payments

The formula to calculate the availability payment for a Unit is shown below.

Availability payment per settlement period = CM * CR * 0.5 * FF * (1 – MP/100)

Where:
CM Contracted MW
CR Contracted Availability Rate (£/MWh)
0.5 Converting MW to MWh for 1 settlement period
FF Failure Flag (either 1 = pay, 0 = don't pay)

MP Monthly Penalty which is 1% for every window in the month in which 1 or more EoD's occur (CDEL EoD's, are excluded) - up to a maximum of 30%

Service providers are paid to make their unit/site available for the STOR service within an Availability Window.

No payment will be made to a flexible service provider for a contracted Availability Window where the availability of that unit has been rejected or where the availability has been excluded. A window is excluded if, following provision of STOR, the contracted Recovery Period overlaps the Pre-instruction Window of one or more subsequent contracted Availability Windows.

Availability Window payments are calculated for each related settlement period. There will be no payment for a settlement period for the following events:

1. Availability has been rejected for that Window
2. The Availability Window is an excluded Window
3. The settlement period is subject to an event of default (EoD)

An EoD occurs when the unit/site does not comply with the contract. In summary, checks are undertaken to ensure that;

1. The unit is capable of delivering the service
2. The unit delivers the service when called off

There are three different ways that payments may be affected; non-payment for a settlement period, non-payment for a contract window and non-payment for the remainder of the contract window. The reasons for non-payment ('failure types') can be categorised as data submission, utilisation, availability or delivery. The reasons for non-payment for BM Units are shown in Figure 2 below and for Non BM Units in Figure 3.

Figure 2 - BM Unit events of default

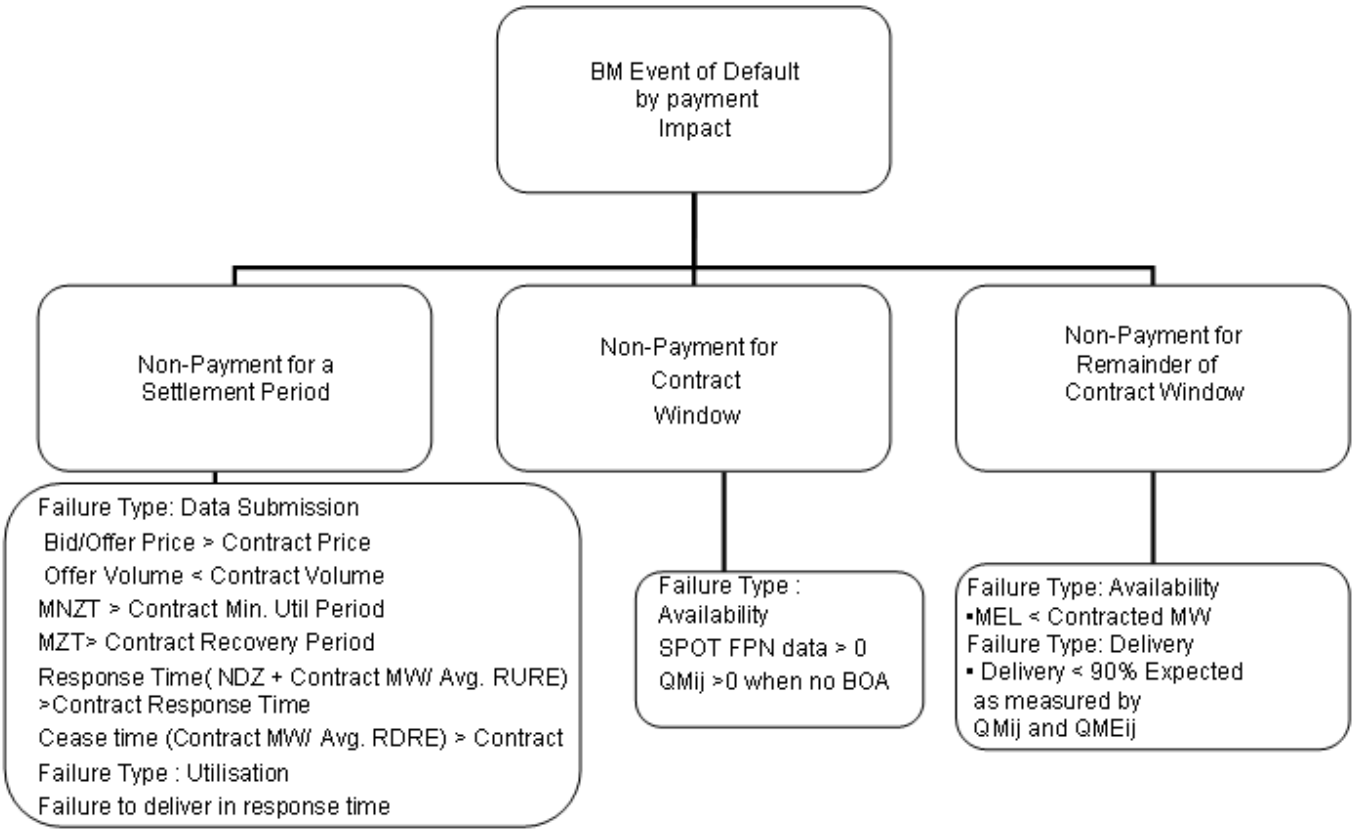
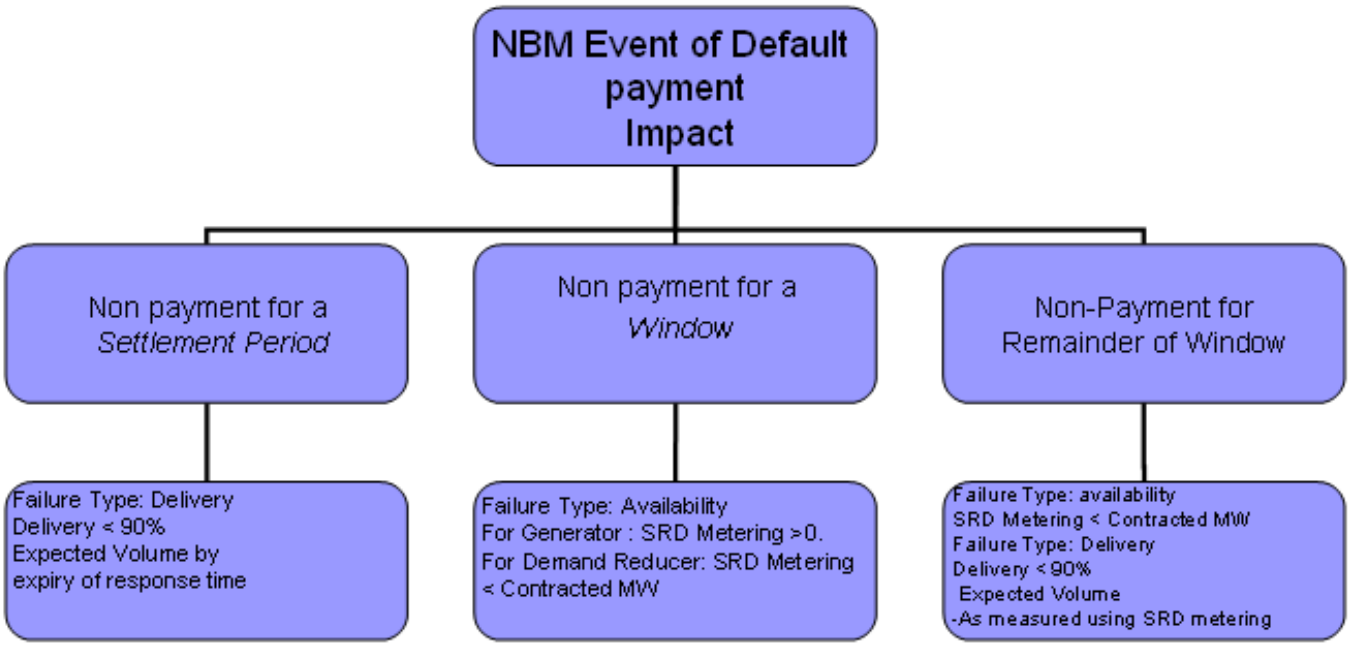


Figure 3 - NBM Unit Events of Default



3.2.2. Utilisation Payments

NBM providers are paid for the capped energy delivered when instructed by National Grid to provide the STOR service. BM providers are instructed via a Bid-Offer-Acceptance and hence are remunerated through the Balancing Mechanism

Utilisation payments are paid at the contracted Utilisation Rate during the contracted Availability Window, pre-window & post window ramping periods - unless the contracted Availability Window has had its availability rejected by National Grid, or the Availability Window is deemed an excluded window (in these circumstances the window will be deemed an Optional Window). Utilisation payments during optional windows are paid at the Optional Rate.

Payments for utilisation are calculated separately for contracted Availability and Optional windows, and for ramping and non-ramping periods at a settlements period/part settlement period granularity.

Payments per settlement period/part settlement period are calculated by multiplying the Capped Energy by the Applicable Payment Rate where:

Capped Energy is the minimum of the Expected MWh and Delivered MWh and

Applicable Payment Rate is the Contracted Utilisation Rate - unless the period is an Optional Window when the Optional Rate is applied.

Delivered energy is measured on a minute-by-minute basis as the difference between the base load MW and metered MW. The Base Load is what the unit was doing when the STOR service was instructed.

3.3. NBM Utilisation Payment Example

This section works through an example of an NBM utilisation computation for a generator and demand reducer in the following order:

1. Calculate Base Load
2. Segment the instructions
3. Calculate Expected Energy
4. Calculate Delivered Energy
5. Calculate Capped Energy
6. Calculate Payment

The example is based on the data in the following tables:

Table 1

Contract Window	
Start	End
00:00	03:00

Table 2

Generator Details	
Contracted MW	12MW
Ramp up	2MW/min
Ramp down	2MW/min
Contracted Response Time	20 Mins
time	0 mins

Table 3

Instruction Details	Time
Instruction issued	00:05
Response Time Expires	00:25
Instruction Ceased	01:25

Table 4

Payment Rate	£/MWh
Availability Rate	9
Utilisation Rate	300
Optional Rate	550

Please see figure 1 to show when Optional and Utilisation rate come into effect.

3.3.1. Calculate Base Load

Base load MW is typically calculated as the average metered MW for the 3 minutes before the instruction issue time and metered MW at instruction issue.

The Base Load calculation for a generator and demand reducer is shown below

Base Load Calculation

Generator

Time	MW
00:02	0
00:03	0
00:04	0
Issue Time 00:05	0
Average MW	**0**
Base Load MW	**0**

Demand Reducer

Time	MW
00:02	10
00:03	12
00:04	16
Issue Time 00:05	22
Average MW	**15**
Base Load MW	**15**

Base Load Generator = Average (0+0+0+0) = 0MW

Base Load Demand Reducer = Average (10+12+16+22) = 15MW

3.3.2. Segment The Instructions

The time for which the instruction is active is segmented into contracted Availability and Optional Windows, ramping and non-ramping periods. In the example provided the instruction falls entirely within a contracted Availability Window.
The relevant segments are;

Ramp up	From 00:19 to 00:25
Non Ramp	From 00:25 to 01:25
Ramp down	From 01:25 to 01:31

The segments are then split into settlement periods /part settlement periods to which they relate. The segments are divided into SP as follows:

SP 1	From 00:19 to 00:25	Ramp up
SP 1	From 00:25 to 00:30	Non Ramp
SP 2	From 00:30 to 01:00	Non Ramp
SP 3	From 01:00 to 01:25	Non Ramp
SP 3	From 01:25 to 01:30	Ramp down
SP 4	From 01:30 to 01:31	Ramp down

The Ramp up period is calculated as;

Contracted MW / Ramp Up Rate = 12/2 = 6mins

The Ramp down period is calculated as;

Contracted MW / Ramp Down rate = 12/2 = 6mins

3.3.3. Calculate Expected Energy and Delivered Energy

Expected Energy
Expected Energy (MWh) per minute (Non Ramp) =

1/60 x Contracted MW

Expected Energy (MWh) per minute (whilst Ramp) =

1/60 x Contracted MW x 0.5

Total the Expected Energy calculated for the settlement period/part settlement period and round the outcome to 3 decimal places.

Delivered Energy
Delivered Energy per minute (Generator) =

(Metered MW – Base Load MW) x 1/60

Delivered Energy per minute (Demand Reducer) =

(Base Load MW – Metered MW) x 1/60

Sum the Delivered Energy calculated above for the settlement period/part settlement period and round to 3 d.p. These are shown in Appendices 2 and 3 for the Generator and Demand Reducer respectively.

3.3.4. Calculate Capped Energy

Capped Energy is determined by segment and is the minimum of the total Expected Energy and the total Delivered Energy.

Appendices 2 and 3 show the calculation of Expected, Delivered and Capped Energy where the service provider is a Generator and Demand Reducer respectively.

3.3.5. Calculate Payment

Once the capped energy volumes have been calculated it is then possible to determine the payment by applying the applicable payment rate.

If the capped energy volume for the instruction segment is within a contracted Availability Window (or during the pre-window and post window ramp periods) then the contracted Utilisation Rate will apply otherwise the contracted Optional Rate will apply.

The Capped Energy figures summarised in Figure 4/5 are all within the contracted Availability Window so the Contracted Rate (PRu) applies. Figure 4 shows a breakdown for a Generator.

Figure 4 - Generation

Stage	SP covered	Capped Energy Mwh	Payment
Ramp Up	1	0.5	150
Utilisation	1	1	300
Utilisation	2	5.75	1725
Utilisation	3	5	1500
Ramp Down	3	0.5	150
Ramp Down	4	0.05	15

Figure 5 shows a breakdown for a Demand Reducer

Figure 5 - Demand Reduction

Stage	SP covered	Capped Energy Mwh	Payment
Ramp Up	1	0.6	180
Utilisation	1	1	300
Utilisation	2	5.75	1725
Utilisation	3	5	1500
Ramp Down	3	0.5	150
Ramp Down	4	0.05	15

3.4. Reconciliation Runs

The reconciliation of payments by month, season and term is detailed below.

3.4.1. Monthly penalty

For every window where there is an EoD (any type excluding delivery failure CDEL) a 1% availability payment reduction is made for the month up to a maximum reduction of 30%.

3.4.2. Seasonal Delivery Reconciliation (SDR) - Utilisation

If the unit fails to deliver 95% of Expected Delivery volumes in a season then the unit will be subject to a Seasonal Delivery Reconciliation. This will 'claw back' Availability payments by the % of under delivery multiplied by Availability payment.

The claw back will be reduced where the number of call offs is less than the contracted threshold for the season.

Note: service delivery during excluded periods is not included within this calculation

3.4.3. Term Reconciliation - Availability

During the financial year a unit must be available for at least 85% of its contracted Availability. A unit is deemed available if the unit was paid for the settlement period concerned. If the unit has not been available for at least 85% of its contracted Availability then it will be subject to a Term Availability Reconciliation whereby availability payments (after any season delivery reconciliation) will be claimed back in proportion to the '% points' by which the number of available settlement periods is below 85% contracted Availability.

Rejected and excluded windows are not included in the calculation. Where the unit is a flexible service provider contracted Availability is based on Availability declarations prevailing 10am each Friday as adjusted by National Grid's Availability rejection.

4 PAYMENT REPORTS

There are a total of 10 reports for STOR; 5 of these are for BM providers and 5 for NBM providers.

4.1. BM Providers

4.1.1. Daily Technical Report for BM Availability Payments (SBA)

These reports have a file prefix of SBA and contain unit availability for a day. The report contains following information

1. General header information section – Company Name, Settlement Date, Run Type, Day Type, Production Date & Price Base.

2. Unit/Contract specific information section – Contract No., Contract ID, Committed Contract (type),Response Time, Standby Tolerance, Expected Capacity, Maximum Utilisation Period, Availability Reduction, Import Capacity, Recovery Period, Utilisation Rate, Minimum Utilisation Period

3. Availability details section consists of the following;

Header	Details
Supplier Code	Unit Code
Win	Window Number
SP	Settlement Period
Avail	MW availability of Unit
BO	Offer Price
BID	Bid Price
OFFER	Offer Price
BOVol	BOA volume
FPN	Final Physical Notification volume
NDZ	Notice to Deviate from Zero
MZT	Minimum Zero Time
MNZT	Minimum Non Zero Time
METERED VOLUME	Volume metered during the settlement period
Util Fail	Utilisation failure flag
Manl Fail	Manual failure flag
Auto Fail	Automatic failure flag
FF	Failure Flag
FM	Force Majeure Flag
Avail Rate	Payment rate
Avail Payment	Total payment for SP = **CM * CR * 0.5 * PF * (1 – MP/100)**

Total/Split	Details
Window Total	Total Payment for window = sum of Avail Payment for a window

4.1.2. Daily Technical Report for BM Utilisation (SBU)

These reports have the file prefix of SBU and contain utilisation information for the day

1. General header information section – Company Name, Settlement Date, Run Type, Day Type, Production Date

2. Unit/Contract specific information section – Contract NO.,CONTRACT ID, COMMITTED CONTRACT (type), EXP CAPACITY (expected), IMP CAPACITY (import)

3. Utilisation details section consists of the following;

Header	Details
Supplier Code	Unit Code
Sn	Season
Start	Instruction Start (also contains stage start)
End	Instruction end (also contains stage end)
Win	Window Number
FPN Volume	Final Physical Notification volume
BidOff	Bid Offer volume
QM Metered Volume	Actual Metered volume
QME Expected Volume	Expected contracted volume
Expected Energy	Expected contracted energy (same as Expected volume)
Delivered Energy	Actual energy delivered
Delivery PerCent	Percentage of energy delivered compared to contract
Capped Energy	min(Delivered Energy , Expected energy)
Resp Fail	Response time failures
Delv Fail	Delivery Failure
Othr Fail	Failures that are not Response or Delivery related

4.1.3. Daily BM Failures Report (SBF)

Reports contain failure information relating to a unit for the day

1. General header information section – Company Name, Settlement Date, Run Type, Production Date

2. Failure details section consists of the following;

Header	Details
Contract Id	Unit Code

Failure Start	Start date and time
SP	Related Start Settlement Period
Failure End	End date and time
SP	Related End Settlement Period
Code	EoD code
Group	EoD group
Description of Failure	Description of type of failure

4.1.4. Monthly BM Payments by Contract (SBC)

Report contains payment split for month by contract

1. General header information section – Company Name, Settlement Date, Run Type, Production Date

2. Contract details section consists of the following;

Header	Details
Cont No.	Contract number
Cont Id	Unit name
Cm /Fx	Confirms if unit is committed (c) of flexible (f)
Avail Payments	Availability payments for Unit

Totals/Split	Details
Total BM Payments	Total payments for BM Unit

4.1.5. Monthly BM Payments by Day (SBD)

Report contains payment for a unit for a month by day

1. General header information section – Company Name, Settlement Date, Run Type, Production Date

2. Day details section consists of the following;

Header	Details
Contract No.	Contract number
Contract Id	Unit name and underneath date details for month
Day Type	Confirms date as working day (WD) or non-working day (NWD)
Avail Payments	Availability payments for Unit

Totals/Split	Details
Total BM Payments	Total payments for BM Unit

4.2. NBM Providers

4.2.1. Daily Technical Report For NBM Availability Payments (SNA)

This report contains unit availability for a day the report contains following information

1. General header information section – Company Name, Settlement Date, Run Type, Day Type, Production Date & Price Base.

2. Unit/Contract specific information section – Contract No., Contract ID, Committed Contract (type), Standby Tolerance, Capacity, Meter Delay, Bad Meter Flag & Negative Load

3. Availability details section consists of the following;

Header	Details
Supplier Code	Unit Code
Win	Window Number
SP	Settlement Period
Avail	MW availability of Unit
METERED VOLUME	Volume metered during the period
CAPAB FAIL	Failure related to capability
Util Fail	Failure information related to utilisation
Manl Fail	Manual failure information
Auto Fail	Automatic failure information
FF	Failure Flag
FM	Force Majeure Failure Flag
Avail Rate	Payment rate
Avail Payment	Total payment for window = Contract MW*Avail Rate*0.5*FF*FM
Avail Rate	Payment rate
Avail Payment	Total payment for window = **CM * CR * 0.5 * PF * (1 – MP/100)**

Totals/Split	Details
Contract Total	Total Payment for window = sum of Avail Payment for a unit
Company Total	sum of all Contract Total values

4.2.2. Daily Technical Report For NBM Utilisation Payments (SNU)

Report contains Utilisation details for a unit including ramping

1. General header information section – Company Name, Settlement Date, Run Type, Day Type, Production Date & Price Base.
2. Unit/Contract specific information section – Contract No., Contract ID, Committed Contract (type), Capacity, OPT Capacity (optional)
3. Utilisations sections consists of the following;

Header	Details

Supplier Code	Unit Name
Sn	Season
Issue	Issue time of instruction
Start	Start time of instruction – ramping
End	End time of instruction
Win	Related window
Inst	
Contract Energy	Contracted energy
Expected Energy	Energy expected MWh
Delivered Energy	Metered energy
Delivy PerCent	The percentage of energy delivered compared to contract energy
Capped Energy	Min(expected energy, delivered energy)
Util Rate	Utilisation rate
Util Payment	Payment for utilisation
Resp Fail	Response time failure
Delv Dail	Delivery failure
Othr Fail	Failure which is not response of delivery related
Ramp Flag	Indicates ramp up/down stage with R

Totals/Splits	Details
Utilisation Totals	Total utilisation for periods
Contract Totals	Total utilisation for unit
Company Totals	Total utilisation for all unit

4.2.3. Daily NBM Failures Report (SNF)

Reports all failures for a unit in a day

1. General header information section – Company Name, Settlement Date, Run Type, Production Date

2. Contract details section consists of the following;

Header	Details
Contract Id	Unit name
Failure Start	Start date and time
SP	Related Failure Start Settlement Period
Failure End	End date and time
SP	Related Failure End Settlement Period
Code	EoD code
Group	EoD group
Description of Failure	Description of type of failure

4.2.4. Monthly NBM Payments by Contract (SNC)

Report contains payment split for month by contract

1. General header information section – Company Name, Date, Run Type, Produced On.

2. Payments details section consists of the following;

Header	Details
Cont No.	Contract number
Cont Id	Unit name
Cm /Fx	Confirms if unit is committed (c) of flexible (f)
Avail Payments	Payments for Availability
Util In Window	Utilisation In Window
Util Ex Window	Utilisaiton outside of window
Util Payments	Total Utilisation Payment
Total NBM Payments	Total Payment for Unit

Totals/Split	Details
Total NBM Payments	Total payments for NBM Units

4.2.5. Monthly NBM Payments by Day (SND)

Report contains payment for a unit for a month by day

1. General header information section – Company Name, Settlement Date, Run Type, Production Date

2. Day details section consists of the following;

Header	Details
Contract No.	Contract number
Contract Id	Unit name and underneath date details for month
Day Type	Confirms date as working day (WD) or non-working day (NWD)
Avail Payments	Availability payments for Unit
Util In Window	Utilisation in Contracted Availability window
Util Ex Window	Utilisation outside of Contracted Availability window i.e. within an optional window
Util Payments	Total Utilisation Payment
Total NBM Payments	Total payment for day

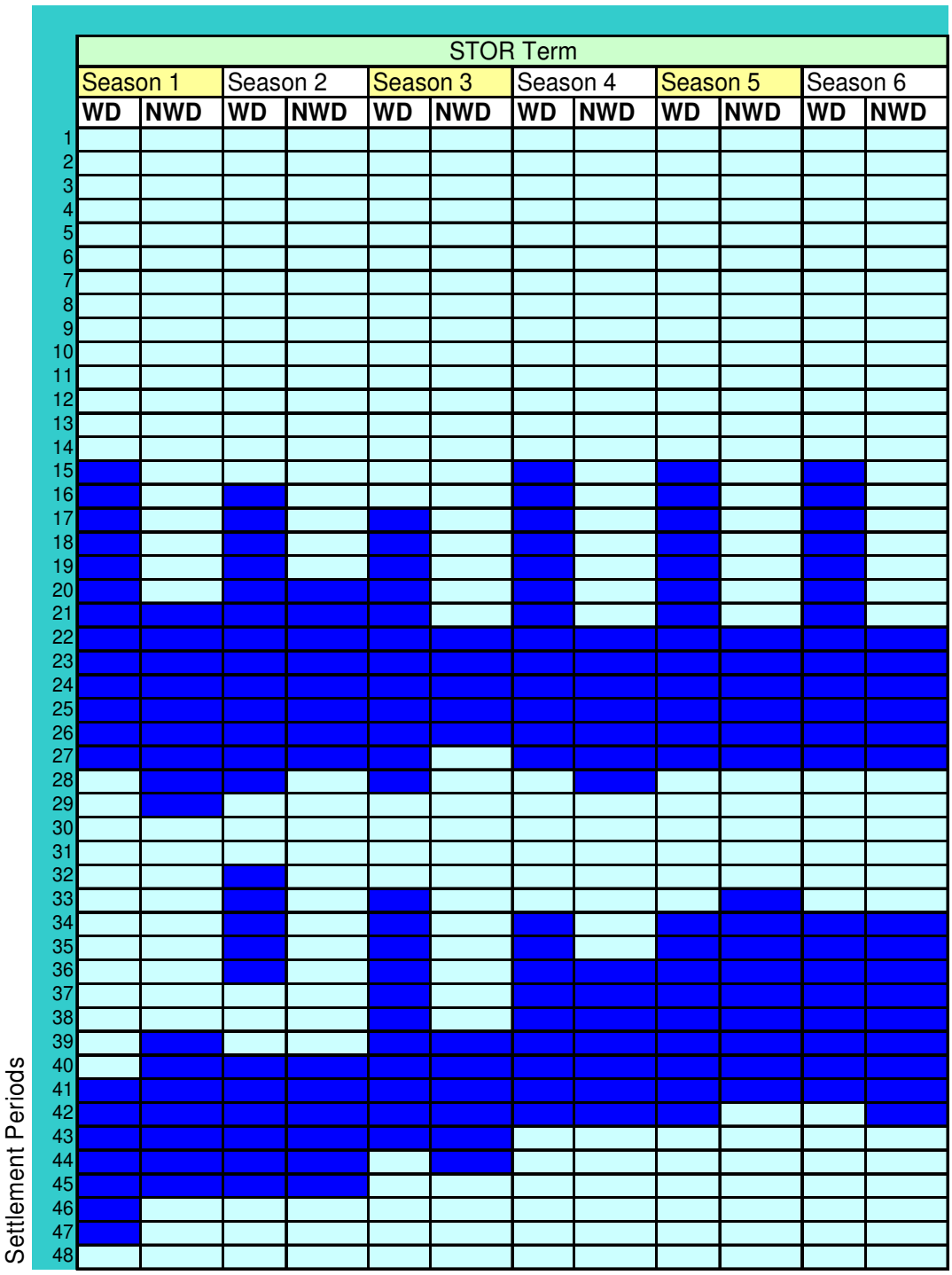
Totals/Split	Details
Total NBM Payments	Total payments for NBM Unit

5 GLOSSARY

Term	Description	Full Name
Availability Rate	Rate for service availability £/MWh	
Availability Window	Agree period of contracted availability	
Base Load	average metered MW for the 3 minutes before the instruction issue time and metered MW at instruction issue	
BM	This is the mechanism for the making and acceptance of offers and bids pursuant to the arrangements contained in the Balancing and Settlement Code (BSC).	Balancing Mechanism
BM Profile	Contracted FPN as adjusted by any BOAs	
BM Provider	An individual generation or demand unit that offers into the BM (e.g a generating unit at a power station)	Balancing Mechanism Unit
BMRA	Agent who reports BM volumes and costs based on data received	Balancing Mechanism Reporting Agent
BOA	Issued as an instruction to either increase or decrease from the FPN by specifying a new operating level	Bid Offer Acceptance
Capped Energy	Is minimum of expected energy and delivered energy	
CUSC	Technical requirements regarding connection to system. Provides generic settlement terms in section 4 for Frequency Response	Connection and Use of System Code
EDL	System to despatch instructions	Electronic Despatch Logger
EoD	Instances where a Unit/Site has not met contractual parameters and is therefore subject to applicable penalties	Events of Default
FPN	A units planned output	Final Physical Notification
Instruction	Information received regarding movements in generation	
MEL	Maximum output for any given unit	Maximum Export Level
MNZT	is the minimum duration of a bid-offer acceptance	Minimum Non-Zero Time
MW	Unit of Power equal to 1 Million Watts	Mega-Watt
MWh	Unit of Energy equivalent to 1 Million Watt Hours	Mega-Watt Hour
MZT	minimum time following the end of a BOA before another BOA can be instructed	Minimum Zero Time
NDZ	Is the period of time for a unit to synchronise with the National grid System and start to generate.	Notice to Deviate from Zero
Non-BM (NBM) Provider	An individual generation or demand unit that is not part of the BM	
Non-Ramping Periods	Unit/site expected MW for period	
NWD	Sunday and National Holidays (excluding Good Friday)	Non Working Day
Optional Rate	Rate of Utilisation within Availability Window and Ramping timescales £/MWh	
QMEij	expected metered volume per settlement	

Term	Description	Full Name
QMij	metered volume per settlement period	
Ramp Down	Time to move from Contracted MW	
Ramp up	Time to move to Contracted MW	
Ramping Periods	Unit/site movement to and from contracted MW - Ramp up & Ramp Down	
RDRE	Enables the time for the unit to return to zero MW to be computed	Run Down Rate Export
Recovery Period	The Minimum time period a unit/site can be instruct again after an instruction	
Response Time	Time to respond to Instruction	
RURE	Is used to determine how long it will take unit to get to it's contracted MW	Run up Rate Export
SAA	This agent performs the calculations in accordance with the BSC	Settlement Administration Agent
SEL	Minimum output level for any given unit	Stable Export Level
Settlement Period (SP)	The periods for Electricity trading - 48 SP's unless on clock change day then 46 or 50 SP's	
SORT	A system used in the control room to instruct balancing services	System Operation Real Time
SPSRD	System used to monitor NBM Availability and Utilisation	Single Point Standing Reserve Despatch
Utilisation Rate	Rate of Utilisation outside of Availability Window £/MWh	
WD	Monday to Saturday inclusive	Working Day

6 APPENDIX 1 – WINDOWS EXAMPLE



7 APPENDIX 2 – NBM CAPPED ENERGY (GENERATOR)

Generator						
Settlement Period	Minute starting	Metered MW	Delivered MWh/min	Expected MWh/min	Capped MWh/min	Segment
1	00:19	0	0.000000			Ramp up
1	00:20	2	0.033333			Ramp up
1	00:21	4	0.066667			Ramp up
1	00:22	6	0.100000			Ramp up
1	00:23	8	0.133333			Ramp up
1	00:24	10	0.166667			Ramp up
		Segment Total	**0.500**	**0.600**	**0.500**	
1	00:25	12	0.200000			Non-ramp
1	00:26	12	0.200000			Non-ramp
1	00:27	12	0.200000			Non-ramp
1	00:28	12	0.200000			Non-ramp
1	00:29	13	0.216667			Non-ramp
		Segment Total	**1.017**	**1.000**	**1.000**	
2	00:30	10	0.166667			Non-ramp
2	00:31	13	0.216667			Non-ramp
2	00:32	10	0.166667			Non-ramp
2	00:33	13	0.216667			Non-ramp
2	00:34	10	0.166667			Non-ramp
2	00:35	13	0.216667			Non-ramp
2	00:36	10	0.166667			Non-ramp
2	00:37	13	0.216667			Non-ramp
2	00:38	10	0.166667			Non-ramp
2	00:39	13	0.216667			Non-ramp
2	00:40	10	0.166667			Non-ramp
2	00:41	13	0.216667			Non-ramp
2	00:42	10	0.166667			Non-ramp
2	00:43	13	0.216667			Non-ramp
2	00:44	10	0.166667			Non-ramp
2	00:45	13	0.216667			Non-ramp
2	00:46	10	0.166667			Non-ramp
2	00:47	13	0.216667			Non-ramp
2	00:48	10	0.166667			Non-ramp
2	00:49	13	0.216667			Non-ramp
2	00:50	10	0.166667			Non-ramp
2	00:51	13	0.216667			Non-ramp
2	00:52	10	0.166667			Non-ramp
2	00:53	13	0.216667			Non-ramp
2	00:54	10	0.166667			Non-ramp
2	00:55	13	0.216667			Non-ramp
2	00:56	10	0.166667			Non-ramp
2	00:57	13	0.216667			Non-ramp
2	00:58	10	0.166667			Non-ramp
2	00:59	13	0.216667			Non-ramp
		Segment	**5.750**	**6.000**	**5.750**	

		Total				
3	01:00	13	0.216667			Non-ramp
3	01:01	13	0.216667			Non-ramp
3	01:02	13	0.216667			Non-ramp
3	01:03	13	0.216667			Non-ramp
3	01:04	13	0.216667			Non-ramp
3	01:05	13	0.216667			Non-ramp
3	01:06	13	0.216667			Non-ramp
3	01:07	13	0.216667			Non-ramp
3	01:08	13	0.216667			Non-ramp
3	01:09	13	0.216667			Non-ramp
3	01:10	13	0.216667			Non-ramp
3	01:11	13	0.216667			Non-ramp
3	01:12	13	0.216667			Non-ramp
3	01:13	13	0.216667			Non-ramp
3	01:14	13	0.216667			Non-ramp
3	01:15	13	0.216667			Non-ramp
3	01:16	13	0.216667			Non-ramp
3	01:17	13	0.216667			Non-ramp
3	01:18	13	0.216667			Non-ramp
3	01:19	13	0.216667			Non-ramp
3	01:20	13	0.216667			Non-ramp
3	01:21	13	0.216667			Non-ramp
3	01:22	13	0.216667			Non-ramp
3	01:23	13	0.216667			Non-ramp
3	01:24	13	0.216667			Non-ramp
		Segment Total	**5.417**	**5.000**	**5.000**	
3	01:25	13	0.216667			Ramp Down
3	01:26	11	0.183333			Ramp Down
3	01:27	9	0.150000			Ramp Down
3	01:28	7	0.116667			Ramp Down
3	01:29	5	0.083333			Ramp Down
		Segment Total	**0.750**	**0.500**	**0.500**	
4	01:30	3	0.05000	0.050	0.100	Ramp Down
		Segment Total	**0.050**	**0.100**	**0.050**	

8 APPENDIX 3 – NBM CAPPED ENERGY (DEMAND REDUCER)

Demand Reducer						
Settlement Period	Minute starting	Metered MW	Delivered MWh/min	Expected MWh/min	Capped MWh/min	Segment
1	00:19	15	0.000000			Ramp Up
1	00:20	10	0.083333			Ramp Up
1	00:21	8	0.116667			Ramp Up
1	00:22	5	0.166667			Ramp Up
1	00:23	3	0.200000			Ramp Up
1	00:24	3	0.200000			Ramp Up
		Segment Total	**0.767**	**0.600**	**0.600**	
1	00:25	3	0.200000			Non-ramp
1	00:26	3	0.200000			Non-ramp
1	00:27	3	0.200000			Non-ramp
1	00:28	3	0.200000			Non-ramp
1	00:29	3	0.200000			Non-ramp
		Segment Total	**1.000**	**1.000**	**1.000**	
2	00:30	2	0.216667			Non-ramp
2	00:31	5	0.166667			Non-ramp
2	00:32	2	0.216667			Non-ramp
2	00:33	5	0.166667			Non-ramp
2	00:34	2	0.216667			Non-ramp
2	00:35	5	0.166667			Non-ramp
2	00:36	2	0.216667			Non-ramp
2	00:37	5	0.166667			Non-ramp
2	00:38	2	0.216667			Non-ramp
2	00:39	5	0.166667			Non-ramp
2	00:40	2	0.216667			Non-ramp
2	00:41	5	0.166667			Non-ramp
2	00:42	2	0.216667			Non-ramp
2	00:43	5	0.166667			Non-ramp
2	00:44	2	0.216667			Non-ramp
2	00:45	5	0.166667			Non-ramp
2	00:46	2	0.216667			Non-ramp
2	00:47	5	0.166667			Non-ramp
2	00:48	2	0.216667			Non-ramp
2	00:49	5	0.166667			Non-ramp
2	00:50	2	0.216667			Non-ramp
2	00:51	5	0.166667			Non-ramp
2	00:52	2	0.216667			Non-ramp
2	00:53	5	0.166667			Non-ramp
2	00:54	2	0.216667			Non-ramp
2	00:55	5	0.166667			Non-ramp
2	00:56	2	0.216667			Non-ramp
2	00:57	5	0.166667			Non-ramp
2	00:58	2	0.216667			Non-ramp
2	00:59	5	0.166667			Non-ramp
		Segment Total	**5.750**	**6.000**	**5.750**	

3	01:00	2	0.216667			Non-ramp
3	01:01	2	0.216667			Non-ramp
3	01:02	2	0.216667			Non-ramp
3	01:03	2	0.216667			Non-ramp
3	01:04	2	0.216667			Non-ramp
3	01:05	2	0.216667			Non-ramp
3	01:06	2	0.216667			Non-ramp
3	01:07	2	0.216667			Non-ramp
3	01:08	2	0.216667			Non-ramp
3	01:09	2	0.216667			Non-ramp
3	01:10	2	0.216667			Non-ramp
3	01:11	2	0.216667			Non-ramp
3	01:12	2	0.216667			Non-ramp
3	01:13	2	0.216667			Non-ramp
3	01:14	2	0.216667			Non-ramp
3	01:15	2	0.216667			Non-ramp
3	01:16	2	0.216667			Non-ramp
3	01:17	2	0.216667			Non-ramp
3	01:18	2	0.216667			Non-ramp
3	01:19	2	0.216667			Non-ramp
3	01:20	2	0.216667			Non-ramp
3	01:21	2	0.216667			Non-ramp
3	01:22	2	0.216667			Non-ramp
3	01:23	2	0.216667			Non-ramp
3	01:24	2	0.216667			Non-ramp
		Segment Total	**5.417**	**5.000**	**5.000**	
3	01:25	2	0.216667			Ramp Down
3	01:26	4	0.183333			Ramp Down
3	01:27	6	0.150000			Ramp Down
3	01:28	8	0.116667			Ramp Down
3	01:29	10	0.083333			Ramp Down
		Segment Total	**0.750**	**0.500**	**0.500**	
4	01:30	12	0.050	0.100	0.050	Ramp Down
		Segment Total	**0.050**	**0.100**	**0.050**	