

# Network Transmission System Gas Supply Emergency / Gas SCR Overview



NTS Emergency Planning Team  
03 September 2015

# Agenda

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1. What is a Network Gas Supply Emergency
2. Classifications of Network Gas Supply Emergencies
3. Gas Emergency Legislation & Procedures
4. Role of the Network Emergency Coordinator (NEC)
5. Constraint Management (Pre-emergency)
6. Network Gas Supply Emergencies
7. Exercise Wolf
8. Significant Code Review (SCR)
9. Emergency Cash out arrangements

# What is a Network Gas Supply Emergency?

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*“A potential or actual supply emergency on the primary system”*

**(NEC Safety Case)**



**Supply emergency:** As defined by the Gas Safety (Management) Regulations 1996 (GS(M)R), an emergency endangering persons and arising from a loss of pressure in a network or any part thereof.



**Primary system:**  
The National Transmission System (NTS)

In other words...

A Network Gas Supply Emergency is a potential or actual loss of pressure on the network, affecting the NTS, which could endanger people.

# Network Gas Supply Emergencies

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- Affects the National Transmission System
- Three types:

## 1. Gas Deficit Emergency (GDE)

- Could be caused by a shortage of beach or storage gas, failure of market arrangements, Supply shortage
- National supply < National Demand


## 2. Safety Monitor Breach (SMB)

- Not enough gas in store to safely isolate non-protected loads
- Not enough gas in store to support protected loads in a 1in50 winter

## 3. Critical Transportation Constraint (CTC)


- Could be caused by damage to a NTS pipeline or compressor station etc
- A physical failure that impedes gas transmission

# GS(M)R


Health and Safety  
Executive

## A guide to the Gas Safety (Management) Regulations 1996

Guidance on Regulations



A guide to the Gas Safety  
(Management) Regulations 1996

This is a free-to-download, web-friendly version of L80, (Second edition, published 2007). This version has been adapted for online use from HSE's current printed version.

You can buy the book at [www.hsebooks.co.uk](http://www.hsebooks.co.uk) and most good bookshops.

ISBN 978 0 7176 1159 1  
Price £8.50

This publication provides advice, information and guidance which should be followed to ensure compliance with the Gas Safety (Management) Regulations 1996. It is aimed at dutyholders including, providers, transporters, installers, managers and perhaps some consumers. It also gives guidance to dutyholders on how they will need to co-operate with those who have to prepare safety cases.

**Important legal notice**  
From 1 April 2009, in relation to gas work for which registration is required by law, gas engineering businesses operating in Great Britain must be registered with the Gas Safe Register. Membership of CORGI will no longer satisfy this legal requirement. For more information, call 0800 408 5500 or visit: [www.gasaferegister.co.uk](http://www.gasaferegister.co.uk)

HSE Books
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“All gas transporters must prepare a safety case, submit to HSE and have it accepted before commencing operations.

Where two or more gas transporters are operating on a network, there should be a sole **network emergency co-ordinator (NEC)** for that network whose safety case has been accepted by the HSE”

Regulation 3(1)

# Network Emergency Coordinator (NEC)

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Role performed by National Grid but  
NEC independent of System Operator



Co-ordination of actions of gas industry to  
prevent or minimise safety consequences of  
a supply emergency



Independent from any commercial  
interests of industry, including National  
Grid. Focus is on **public safety**

# Network Emergency Coordinator (NEC)

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Industry parties have a duty to co-operate with the NEC under GS(M)R



NEC has the authority to direct gas consumers to reduce or cease consumption or increase supply within a given timeframe



Failure of NTS Users to co-operate with NEC directions could result in prosecution under criminal law

# Constraint Management (Pre-emergency)

Business as Usual & Constraint Management

- Shipper Balancing & Incentives
- Transporter Balancing/Capacity Actions & Incentives
- ANS Messages & Notices

- Shippers incentivised to balance themselves
- NTS reconfiguration, linepack usage, DN Flow Swaps etc
- National Grid trade to move SMP and drive NTS balance
- Contractual limits enforced (capacity limits, ramp rates etc)
- Scaleback Off-peak Exit Capacity & cease release of further Daily Firm Exit Capacity
- National Grid trade with Shippers to reduce demand (Exit Capacity Buyback, Offtake Flow Reduction & Locational Energy trading)
- Margins Notice
- Issue Gas Deficit Warning to industry
- Utilise Operating Margins Gas if necessary
- **Convene NEMT, engage NEC, Prepare Emergency Strategy**



# Network Gas Supply Emergencies

## Emergency Stage Framework

# Emergency Stages

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- NEC Safety Case outlines FOUR emergency stages
- Each stage has defined actions available details of which are available in the Network Gas Supply Emergency Procedure (E1)
- NEC authorises the declaration of each emergency stage
- Actions may be taken out of sequence **but** the stage must be declared before actions taken
- For an NEC to declare an Emergency it is assumed National Grid have taken all Commercial and Physical actions available

# Emergency Frameworks Summary

Business as Usual & Constraint Management

- Shipper Balancing & Incentives
- Transporter Balancing/Capacity Actions & Incentives
- ANS Messages & Notices

## GAS DEFICIT WARNING

**Stage 1**  
1  
(Potential)

- NTS Linepack Usage
- Distribution Co-operation & Storage Usage
- Gas Specification GS(M)R range widening

**Stage 2**  
2

- National Grid suspends participation in OCM
- Maximise NTS Supplies
- Firm Load Shedding

**Stage 3**  
3

- Distribution Network allocation & isolation
- Public Appeals

**Stage 4**  
4

- Restoration of Supplies

**NEC EMERGENCY ACTIONS**

# NEC Exercise “Wolf”

When: Wednesday 14<sup>th</sup> & Thursday 15<sup>th</sup> October 2015

## Principal objectives of NEC Exercise:

- Confirm that industry emergency arrangements remain aligned to the Procedure for Network Gas Supply Emergency (reference T/PM/E/1)
- Test of the National Grid and Oil and Gas Authority upstream Oil and Gas Crisis management procedure, web portal and emergency response communications
- Test of the NEMT emergency strategy development, industry communication and processes through emergency stages 1-3
  - Test of the Distribution Networks Allocation and Isolation plans
  - Test National Grid’s external emergency communications system
- Test National Grid’s emergency management instruction pro-formas are clear and concise and embedded into the industry’s emergency procedures
- Test that previous NEC exercise recommendations have been included into the emergency procedures

## Three separate support exercises:

- Individual Distribution Network Emergency contact details validation and conformance to NEC instruction exercise (firm load shedding)
  - Individual Distribution Network Critical Transportation Constraint (CTC) exercises
  - National Grid Commercial strategy exercise leading into NEC Exercise Wolf

# Gas Security of Supply Significant Code Review (SCR) - Overview



# Background

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- Project Discovery (2009)
  - Concerns regarding ability to attract gas supplies to GB in an emergency (frozen cashout price)
- SCR Aims
  - Minimise likelihood of a Gas Deficit Emergency (GDE) occurring;
  - Minimise duration if a GDE occurs; and
  - Make payments to firm consumers for curtailment
- SCR duration January 2011 to September 2014
  - Ofgem direction to modify the UNC under Section 36C of the Gas Act 1986; and
  - Supporting modifications of Shipper and Supplier Licences
  - To be implemented by 1 October 2015

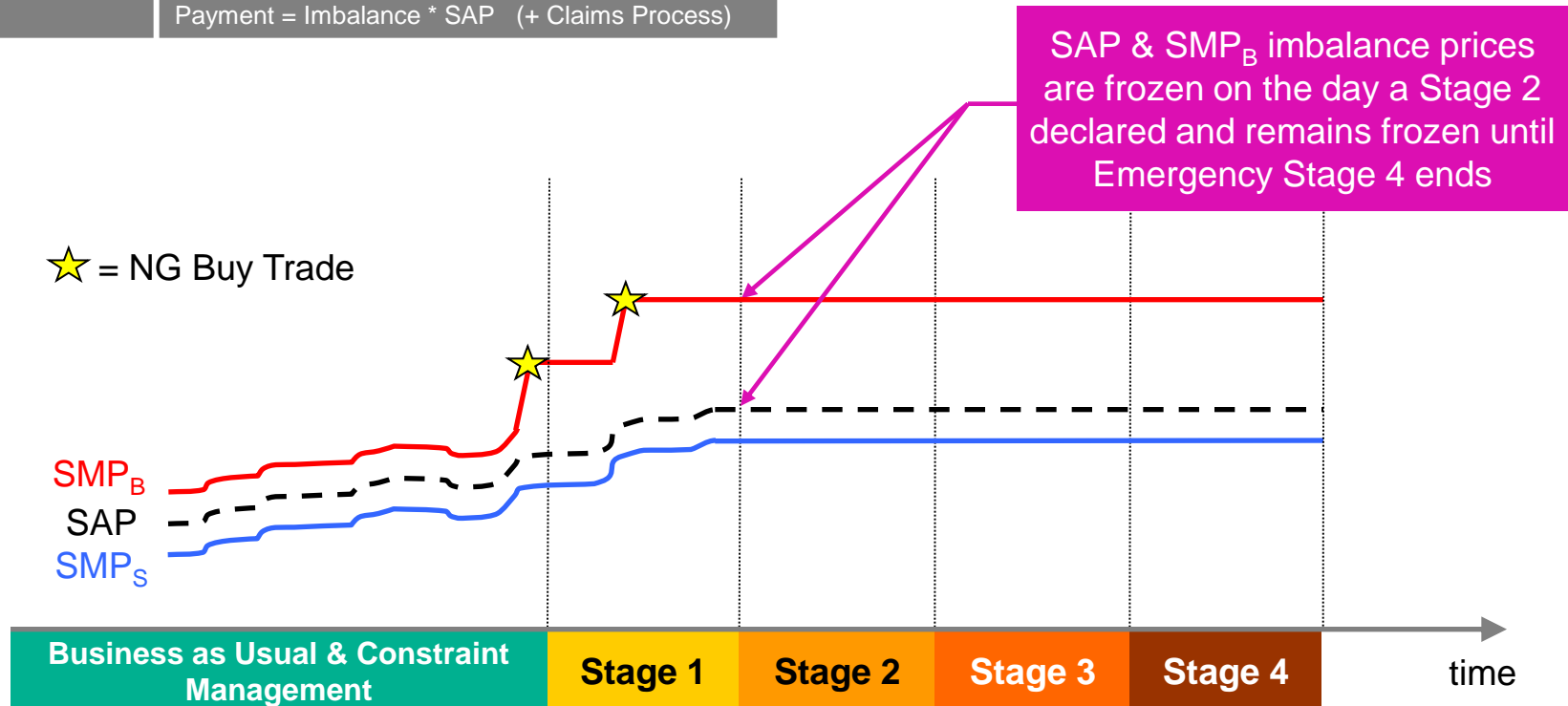
## Gas SCR - Areas of Change

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- Cash out charges in an emergency unfrozen to better reflect cost of consumer interruptions
- Involuntary disconnection payments to consumers are priced into cash-out
- Funds recovered from cash-out charges are used to make payments to consumers for their *involuntary* DSR service they provide
  - DM – 30 day average SAP
  - NDM - £14/therm for first day of disconnection (Stage 3)
    - ~£30/day - only applies to days when any new network isolation is initiated
- Obligation on shippers to pass on compensation to customers

# Emergency Cashout Arrangements

Balance Position	Imbalance Charge/Payment
Balanced	Zero
Light	Charge = Imbalance * $SMP_B$
Heavy	Payment = Imbalance * SAP (+ Claims Process)



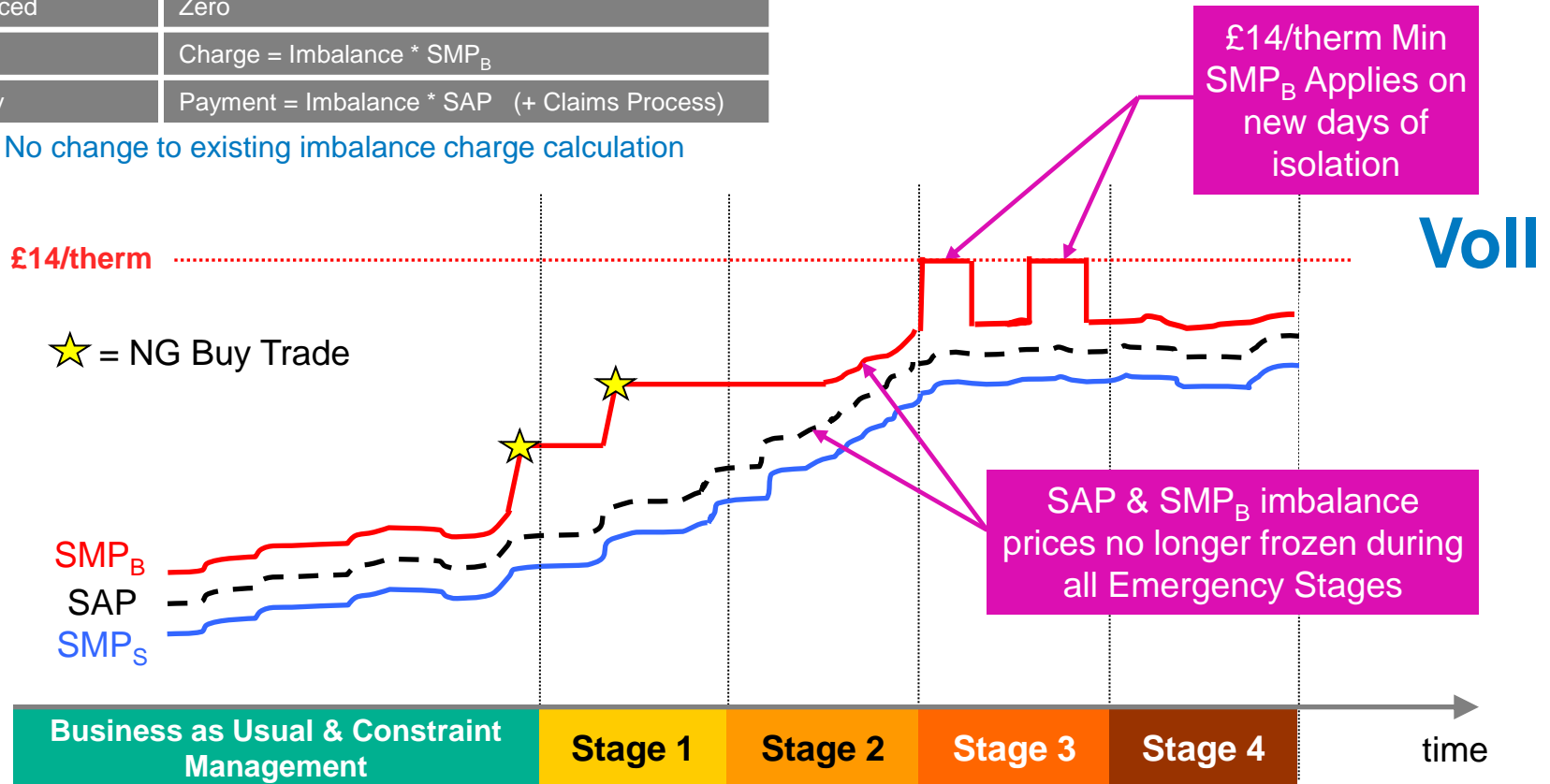


# Emergency Cashout Arrangements

2015/16 Onwards (Driven through Ofgem Significant Code Review)

Balance Position	Imbalance Charge/Payment
Balanced	Zero
Light	Charge = Imbalance * $SMP_B$
Heavy	Payment = Imbalance * $SAP$ (+ Claims Process)

**Note:** No change to existing imbalance charge calculation



**Note:** £14/therm minimum  $SMP_B$  not applicable if  $SAP$  + fixed differential rises above £14/therm

**Note:** The  $SMP_B$  price when entering Stage 2 or 3 is the “floor” price for the remainder of the emergency

## Further implementation changes

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- New rules for the robustness of SAP in GDE Stage 2+.
- Balancing Neutrality Mechanism revised to deliver cashout changes:
  - Payment arrangements for involuntary supply curtailment
    - Funding (via Energy Balancing)
    - Payments (via Energy Balancing)
    - Exclusion of commercial interruption
  - Rectification of balancing position in case of FLS
- Settlement timescales
- See SCR annex for more detail

# SCR Summary

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- Changes to the Gas Deficit Emergency Cashout arrangements that recompense End Consumers for involuntary demand side interruption of supply during a GDE
- Implementation date: October 2015
- Operational Impacts to Industry:
  - Changes to cashout arrangements during an Emergency (SAP & SMP prices are un-frozen)
- Industry Activities:
  - Emergency processes are largely 'AS IS' for external parties
  - Minor changes to National Grid emergency procedures
  - National Grid Emergency Planning Team engaging with ICE Endex wrt ICE system changes
  - Changes to National Grid notifications to ICE Endex

## Further information – emergency procedures

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- A range of emergency procedural information is available on the National Grid website

[www.nationalgrid.com/NEC](http://www.nationalgrid.com/NEC) (shortcut link to NG emergency webpages)

- National Grid Transmission Contacts:

- Gary Dolphin– Emergency Planning Manager (01926 65 6210)

[gary.dolphin@nationalgrid.com](mailto:gary.dolphin@nationalgrid.com)

- Chris Hewitt – Emergency Planning Officer (01926 65 3846)

[chris.hewitt@nationalgrid.com](mailto:chris.hewitt@nationalgrid.com)

- National Grid Transmission Emergency Planning Team:

[gasops.emergencyplanning@nationalgrid.com](mailto:gasops.emergencyplanning@nationalgrid.com)

# Demand Side Response update

TX workgroup - 3<sup>rd</sup> September 2015

## Background

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- As part of SoS SCR Ofgem initiated a consultation in July 2013 on the development of a DSR Mechanism
- The SCR process identified that the gas market would benefit from large consumers reducing demand voluntarily ahead of an emergency
- Licence obligations were put in place that require NGG to develop a DSR methodology, run a trial and implement the methodology if directed to do so
- The mechanism has been developed with Industry input and approved by Ofgem to progress to the trial phase

## What is Gas DSR?

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*The DSR product would provide an additional 'route to market' through which Gas Consumers could offer to turn down their gas consumption at times of system stress in return for a payment*

### **DSR offers would...**

- **Only be used once a GDW had been announced;**
- **Only be accepted by NGG;**
- **Utilise the existing OCM – locational market;**
- **Only be eligible to consumers with an AQ greater than 2 million therms and who could offer at least 100,000 kWhs; and**
- **Only be paid for if the offer was accepted i.e. no option fees.**

## Gas DSR Trial

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- The trial was developed with Industry input and NGG progressed with a web based, two phased option

It aimed to:

- Provide an indication of Industry appetite for a DSR product;
- To test some of the high level principles of the methodology;
- To give trial participants a greater awareness of the DSR methodology; and
- To help inform Ofgem's decision on whether to progress to implementation.



## Post Trial

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- The trial ended on the 29<sup>th</sup> July 2015 – NGG submitted their report on the trial to Ofgem on the 26<sup>th</sup> August
- Ofgem decision on moving to the next phase should be made by the 23<sup>rd</sup> September
- NGG will need to raise the UNC mods to formally introduce the DSR methodology as soon as reasonably practicable – suggested Oct 16
- 1<sup>st</sup> Mod Workgroup 22<sup>nd</sup> September 2015
  - Run through the DSR progress to date
  - DSR Trial results
  - Future Mod Workgroups

## Further information – SCR & DSR

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- SCR contact details

- Phil Lucas – Senior Commercial Analyst (01926 65 3546)  
[phil.lucas@nationalgrid.com](mailto:phil.lucas@nationalgrid.com)

- DSR contact details

- Gareth Davies – Balancing Code Development Manager (01926 65 4850) [gareth.davies5@nationalgrid.com](mailto:gareth.davies5@nationalgrid.com)

# Gas SCR Annex

## Annex Components

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- Cash out prices – encouraging supply
  - Fall back SAP
- Neutrality – rectification of balancing position
  - DM ECQ
  - NDM Uplift (NDM ECQ)
- Neutrality - Payment arrangements for involuntary supply curtailment
  - Funding (via Energy Balancing)
  - Payments (via Energy Balancing)
  - Exclusion of commercial interruption
- Settlement timescales

## Cash Out Prices: Fall Back SAP

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- GDE Stage 2+: Fall-Back SAP will be applied where SAP fails to meet the following criteria:
  - the total volume traded is below 250,000 therms/day; and/or
  - there are fewer than 5 trades on the day; and/or
  - there are fewer than 5 counterparties on the day
  
- Fall-Back SAP:
  - 25%: The volume-weighted average (VWA) of executed trades (i.e. the normal SAP calculation)
  - 25%: The median of executed trades; and
  - 50%\*: The SAP from the last day on which none of the 'fall back' criteria were triggered
  - \*NB: if no trades then 100% on last element

## 2(a) Balancing Neutrality Mechanism

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- What is balancing neutrality?
  - UNC section F1.1.2 (d)

“**Balancing Neutrality Charges**” are amounts payable by or to National Grid NTS, so that it does not gain or lose by the payment and receipt of Market Balancing Action Charges, Daily Imbalance Charges, Scheduling Charges and other amounts specified in and in accordance with paragraph 4;”
  - Mechanism for distribution of imbalance cash flows and recovery of SO costs
  - Net cash flow is approximately £20m per annum to the industry

## 2(b) Rectification of Balancing Position

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- Emergency Curtailment Quantity (ECQ) methodologies (NDM and DM) used to determine User UDQO had GDE curtailment not occurred
  - Reduced NDM allocation reduces Shippers' UDQO, reducing Shippers' financial exposure to high cashout costs and market prices.
- Deemed User trade with SO for curtailed volume (DM: existing; NDM: new 'NDM uplift')
  - All volumes applied at average SAP price of previous 30 days
- Commercially interruptible Supply Points that have been curtailed will be excluded from UDQO calculation

## 3(b) Involuntary DSR Payments: Payment Allocation

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DSR Fund will be allocated as follows:

- DM
  - as per DR Curtailed Volume
- NDM
  - Requires calculation to determine change in NDM demand as a result of curtailment
  - The NDM DSR Fund will be calculated based on the forecast demand offtake less the LDZ allocation \* NDM (£14/therm)
  - The NDM fund will be prorated to all involuntary curtailed NDM based on the relevant SOQ



# 3(d) Involuntary DSR Payments: NDM Proration

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## **NDM Domestic:**

- Domestic Market Sector Flag (regardless of Load Band)
- Average Domestic SOQ used as the value for the DSR payment

## **NDM Non-Domestic:**

- Within the 3 non-domestic load bands [ 0-73.2, 73.2 – 293, 293 – 732 MWh] the average SOQ for the relevant Load Band will apply;
- Supply Points > 732 MWh will utilise individual SOQ

# 3(a) Involuntary DSR Payments: Funding

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- Funding from Balancing Neutrality
  - Significant imbalance charges from supply deficit (short Users)
- DSR Fund determined
  - DR curtailment funds for DM Supply Points
    - DR curtailed volume x 30 day average SAP
      - each day subject to Stage 3 isolation
  - NDR curtailment funds for NDM Supply Points
    - NDR curtailed volume x NDM Value of Lost Load (VOLL)
      - VoLL = £14/therm or 27.77p/kWh
      - First day of curtailment only
- Commercially interruptible Supply Points that have been curtailed are not entitled to payment

## 3(e) Involuntary DSR Payments: Shortfall of payments

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- Shortfall in required DSR funds

- Initially targeted at short shippers

$$\frac{\text{Shortfall}}{\text{Greater of}} \times \text{Volume of shippers short position}$$

the total volume of involuntary DSR, or  
Total volume of short shippers imbalance position

- Remaining shortfall pro-rated across end consumers reducing involuntary DSR payments

- Non-payment of EBI

- Existing Neutrality Mechanism and Energy Balancing Debt Recovery arrangements will apply

- However, smear based upon UDQO and UDQI over previous year and not for the relevant day (as is the case under existing rules)

## 3(f) Involuntary DSR Payments: Commercial Interruption

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- A Supply Point with a Commercial Interruption contract with a Supplier is excluded from payment arrangements
  - Interruptible volume also excluded from rectification of balancing position
- User (shipper) required to inform NGG (via Xoserve) of existence of such contracts
  - 30 days prior to October in each Year; or
  - as soon as reasonably practicable if this agreement was made later

## 4 Settlement Timescales

Charge	Calculation	
Short imbalance cashout	Imbalance Volume X relevant cashout price	} M+28
Targeted shortfall cost for required DSR Fund	Imbalance Volume X weighted Unit price	
Involuntary DSR Payment	Curtailment Volume X (DM: 30 day average SAP) / (NDM: VoLL)  NB: prorated if shortfall remains	} M+M4 (18 month closeout)