UNC Request	At what stage is this document in the process?
# UNC 0XXX: *(Joint Office to insert number)* ## Investigate Advanced Analytic Options to support NDM Demand Modelling	01 Request 02 Workgroup Report 03 Final Modification Report

Purpose of Request:
To request a UNC Review Group be established to investigate alternative 'advanced analytics' options in order to further improve the accuracy of the EUC Demand Models which are used to derive the Gas Demand Profiles (ALPs, DAFs and PLFs) which are key parameters in the calculation of NDM Allocation and Capacity Invoicing.

✓	The Proposer recommends that this request should be assessed by a Workgroup This request will be presented by the Proposer to the Panel on dd mmm yyyy *(Code Administrator to provide date)*.
!	High Impact:
!	Medium Impact: CDSP, Shippers and Transporters
!	Low Impact: End Consumers

***Guidance On The Use Of This Template**:*

This is a modification template that the Proposer is asked to complete.

All parts other than the Solution (which is "owned" by the Proposer) may be refined by the workgroup process where relevant. A separate checklist is available to help identify impacts that, if material, should be recorded in this template.

If Ofgem are currently conducting a Significant Code Review (SCR), a modification may not be proposed if the subject matter relates to the SCR, unless Ofgem directs otherwise. Please do not, therefore, raise modifications that relate to the SCR without first talking to Ofgem.

If the impact of the modification on greenhouse gas emissions is likely to be material, please assess the quantifiable impact in accordance with the Carbon Costs Guidance (published by Ofgem).

The Joint Office is available to help and support the drafting of any modifications, including guidance on completion of this template and the wider modification process. Contact: enquiries@gasgovernance.co.uk or 0121 288 2107.

Please contact Xoserve when drafting any modification that impacts central systems. They will be available to help and support the drafting of any modifications that impact central systems, including guidance on potential systems impacts and the drafting of business rules, which reflect system capabilities. Contact: Contact: commercial.enquiries@xoserve.com.

Contents

About this document:

Please provide proposer contacts. The Code Administrator will update the contents and provide any additional Specific Code Contacts.

This document is a Request, which will be presented by the Proposer to the panel on dd month year.

The Panel will consider the Proposer's recommendation, and agree whether this Request should be referred to a Workgroup for review.

Any questions?

Contact:
Joint Office of Gas Transporters

enquiries@gasgovernance.co.uk

0121 288 2107

Proposer:
Insert name

email address

telephone

Transporter:
Insert name

email address.

telephone

Systems Provider:
Xoserve

UKLink@xoserve.com

telephone

Additional contacts:
Insert name

email address.

telephone

1 Request

Why is the Request being made?

This request is being proposed by [name of party TBC] to investigate how the industry (via Demand Estimation Sub Committee - DESC) could improve the accuracy of the NDM demand modelling process further by utilising more advanced analytical approaches e.g. Machine Learning. This follows on from findings presented by the UIG Task Force which identified that the NDM Modelling error, which is a significant contributor to the both the levels and volatility of Unidentified Gas, could be reduced further using such techniques.

Demand Estimation Sub Committee (DESC)

Each year DESC are responsible for confirming the End User Category (EUCs) Definitions, Gas Demand Profiles (ALPs and DAFs) and Peak Load Factors (PLFs). DESC also have the responsibility for reviewing the effectiveness of the NDM Algorithm every 3 years, which is now due.

The timetable that DESC follows for it's annual 'BAU activities', particularly from March to August, does not contain a significant amount of available time for exploring alternative demand modelling options. The review of the performance of EUC demand models and any adhoc analysis is usually performed each Autumn/Winter period. In recent years this has included changing the EUC definitions within Bands 1 and 2 (AQ range 0-293MWh pa) and the formula for deriving the Composite Weather Variable (CWV) (now includes a Solar Radiation term), both of which have contributed to improved EUC demand models and subsequently lower UIG.

Unidentified Gas (UIG) Task Force

The Task Force was established to investigate all the possible causes of UIG and provide recommendations for resolving them. The daily estimate of NDM demand inevitably contains error, however the Task Force recommendation suggested the current approach to demand modelling could be improved with the use of Machine Learning techniques.

NDM Algorithm Consultation

In Q4 of 2020, an industry consultation was carried out to explore just how much change in the NDM Algorithm it was prepared to accept ahead of performing any investigative analysis. The results provided clear 'red-lines' in terms of the ALPs and DAFs. These parameters are used extensively across the industry and in many other processes and so any demand modelling approach changes should ensure these parameters are retained and therefore limit any updates to systems for most industry participants.

The establishment of a UNC Review Group will allow any investigative work to proceed at a reasonable pace, given the already busy DESC schedule, and increase visibility of progress across the industry.

Scope

The proposed scope of this review is to consider different options of advanced analytic techniques to produce the underlying EUC Demand Models that are required to create the key parameters of ALP, DAF and PLF. The review may investigate and recommend changes to the components and calculation of parameters associated to the CWV. Out of scope are any options which remove the following parameters: ALP, DAF, PLF, CWV and SNCWV

The review could refer to the work done by the UIG Task Force as a starting point and/or consider any alternatives from interested industry participants.

Note: For the Review Group to maintain good progress and meet its timescales it will be necessary for industry participants to provide options and resource as it will not be possible for the CDSP to a) perform all the analysis of various options (given its commitments to DESC) and b) have the necessary knowledge/experience in advanced analytic techniques such as Machine Learning.

Impacts & Costs

The CDSP is most likely to be impacted at the end of this process given it is currently responsible for the production of the annual Gas Demand Profiles, and so any diversion from the current modelling approach will need to be reflected in updates to its own Demand Estimation modelling systems.

In addition to publishing the headline parameters of ALPs, DAFs and PLFs, a number of supporting files are produced for the industry which include the underlying demand model calculations, the format of these are likely to change in the event the process/approach to producing the demand models is significantly different.

The values of the ALPs, DAFs and PLFs themselves could be markedly different to the current view, this may lead to a 'step change' in some of the downstream calculations such as NDM AQs and SOQs, however any change in the approach to the demand modelling should have proved itself to be a 'better' answer than the current calculation and so any movement in these values should be welcomed but also trailed well in advance.

The ultimate impact of changes brought about by this Review Group should be a better alignment of energy first time around between NDM Allocation and UIG i.e. less modelling error. This would also subsequently result in lower reconciliation/UIG volumes.

Recommendations

It is recommended that this topic is referred to a separate UNC Workgroup, to allow proper discussion of the topic and development of options.

Additional Information

Suggested Background/ References reading below:

UNC Related Document: Demand Estimation Methodology
Current approach to EUC demand modelling: Modelling Approach 2020
UIG Task Force Findings: 13.2.5 – Accuracy of NDM Algorithm – Basic Machine Learning and 13.2.6 – Accuracy of NDM Algorithm – Advanced Machine Learning

Possible uses of Machine Learning in Demand Modelling: Machine Learning Options Paper
NDM Algorithm Consultation - Conclusions Document and Summary Presentation

2 Impacts and Costs

Consideration of Wider Industry Impacts

None Identified

Impacts

Impact on Central Systems and Process	
Central System/Process	Potential impact
UK Link	• None, industry consultation has made it clear that current parameters used in NDM Allocation, AQ calculation etc should not be impacted
Operational Processes	• CDSP's Demand Estimation 'off-line' modelling processes and systems will be impacted by any change of approach

Impact on Users	
Area of Users' business	Potential impact
Administrative and operational	• Potential changes required if demand modelling files at the 'layer' below ALPs, DAFs and PLFs are used in any processes
Development, capital and operating costs	• None
Contractual risks	• None
Legislative, regulatory and contractual obligations and relationships	• Possible changes to UNC Related Document

Impact on Transporters	
Area of Transporters' business	Potential impact
System operation	• None
Development, capital and operating costs	• None
Recovery of costs	• Any changes in the underlying demand models could have the effect of impacting downstream calculations of AQs/SOQs
Price regulation	• None
Contractual risks	• None
Legislative, regulatory and contractual obligations and relationships	• Possible changes to UNC Related Document
Standards of service	• None

Impact on Code Administration	
Area of Code Administration	Potential impact
Modification Rules	• None
UNC Committees	• None
General administration	• None
DSC Committees	• None

Impact on Code	
Code section	Potential impact
	• Section H

Impact on UNC Related Documents and Other Referenced Documents	
Related Document	Potential impact
Network Entry Agreement (TPD I1.3)	• None
General	Potential Impact
Legal Text Guidance Document	• None
UNC Modification Proposals – Guidance for Proposers	• None
Self Governance Guidance	• None
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TPD	Potential Impact
Network Code Operations Reporting Manual (TPD V12)	• None
UNC Data Dictionary	• None
AQ Validation Rules (TPD V12)	• None
AUGE Framework Document	• None
Customer Settlement Error Claims Process	• None
Demand Estimation Methodology	• Very likely to be impacted depending on outcome of analysis e.g. formulae and/or wording to describe modelling approach
Energy Balancing Credit Rules (TPD X2.1)	• None
Energy Settlement Performance Assurance Regime	• None
Guidelines to optimise the use of AQ	• None

Impact on UNC Related Documents and Other Referenced Documents	
amendment system capacity	
Guidelines for Sub-Deduct Arrangements (Prime and Sub-deduct Meter Points)	• None
LDZ Shrinkage Adjustment Methodology	• None
Performance Assurance Report Register	• None
Shares Supply Meter Points Guide and Procedures	• None
Shipper Communications in Incidents of CO Poisoning, Gas Fire/Explosions and Local Gas Supply Emergency	• None
Standards of Service Query Management Operational Guidelines	• None
Network Code Validation Rules	• None
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OAD	Potential Impact
Measurement Error Notification Guidelines (TPD V12)	• None
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EID	Potential Impact
Moffat Designated Arrangements	• None
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IGTAD	Potential Impact
	• None
DSC / CDSP	Potential Impact
Change Management Procedures	• None
Contract Management Procedures	• None
Credit Policy	• None
Credit Rules	• None
UK Link Manual	• None
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Impact on Core Industry Documents and other documents	
Document	Potential impact
Safety Case or other document under Gas Safety (Management) Regulations	• None
Gas Transporter Licence	• None

Other Impacts	
Item impacted	Potential impact
Security of Supply	• None
Operation of the Total System	• None
Industry fragmentation	• None
Terminal operators, consumers, connected system operators, suppliers, producers and other non code parties	• None

3 Terms of Reference

Suggested Terms of Reference may be provided by the Proposer for consideration by the Panel

Background

Insert text here

Topics for Discussion

- Understanding the objective
- Review UIG TF outcomes/analysis
- Confirm scope (consultation conclusions)

- Identify resources / expertise needed
- Agree Timescales
- Determine Data Requirements, Measures and Success Criteria
- Determine options for analysis
- Impact Assess the options
- Shortlist options before analysis
- Perform analysis
- Asses results against Success Criteria
- Development of Solution (including business rules if appropriate)
- Assessment of potential impacts of the Request
- Assessment of implementation costs of any solution identified during the Request
- Assessment of changes to UNC Related Documents and any legal text.

Outputs

Produce a Workgroup Report for submission to the Modification Panel, containing the assessment and recommendations of the Workgroup including a draft modification where appropriate.

Composition of Workgroup

The Workgroup is open to any party that wishes to attend or participate.

A Workgroup meeting will be quorate provided at least two Transporter and two User representatives are present.

Meeting Arrangements

Meetings will be administered by the Joint Office and conducted in accordance with the Code Administration Code of Practice.

4 Recommendations

Proposer's Recommendation to Panel

The Proposer invites the Panel to:

- DETERMINE that Request 0XXX progress to Workgroup for review.