

UNIDENTIFIED GAS

Impact Assessment of LDZ Level UIG Factors

Report No.: , Rev. 1.1

Document No.: 10161618-1

Date: 23 Dec 2019



Project name: Unidentified Gas DNV GL
 Report title: Impact Assessment of LDZ Level UIG Factors Digital Solutions
 Customer: Xoserve Holywell Park
 Customer contact: Fiona Cottam Ashby Road
 Date of issue: 23 Dec 2019 Loughborough
 Project No.: 10161618 LE11 3GR
 Organisation unit: Digital Solutions
 Report No.: , Rev. 1.1
 Document No.: 10161618-1
 Applicable contract(s) governing the provision of this Report:

Objective:

Prepared by: Verified by: Approved by:

Andy Gordon
Senior Consultant

Clive Whitehand
Head of Section

[Name]
[title]

Tony Perchard
Principal Consultant

[Name]
[title]

[Name]
[title]

[Name]
[title]

Copyright © DNV GL 2019. All rights reserved. Unless otherwise agreed in writing: (i) This publication or parts thereof may not be copied, reproduced or transmitted in any form, or by any means, whether digitally or otherwise; (ii) The content of this publication shall be kept confidential by the customer; (iii) No third party may rely on its contents; and (iv) DNV GL undertakes no duty of care toward any third party. Reference to part of this publication which may lead to misinterpretation is prohibited. DNV GL and the Horizon Graphic are trademarks of DNV GL AS.

DNV GL Distribution:

- OPEN. Unrestricted distribution, internal and external.
- INTERNAL use only. Internal DNV GL document.
- CONFIDENTIAL. Distribution within DNV GL according to applicable contract.*
- SECRET. Authorized access only.

Keywords:

[Keywords]

*Specify distribution:

Rev. No.	Date	Reason for Issue	Prepared by	Verified by	Approved by
0.1	2019-11-01	First issue – draft for Xoserve review	Andy Gordon & Tony Perchard	Clive Whitehand	
1.0	2019-11-12	Second Issue – for industry review	Andy Gordon & Tony Perchard	Clive Whitehand	
1.1	2019-12-23	Third Issue	Andy Gordon & Tony Perchard	Clive Whitehand	



Table of contents

1	INTRODUCTION.....	1
2	SUMMARY OF CALCULATIONS	1
2.1	Existing Calculations	1
2.2	Changes Required to Support LDZ Level Factors	1
3	MATERIALITY	2
4	INDUSTRY IMPACT.....	3
5	UIG PROCESS IMPACT.....	4
6	CONCLUSIONS/RECOMMENDATIONS	4

1 INTRODUCTION

This document provides an assessment of the viability and merits of introducing LDZ level UIG factors to the Allocation of Unidentified Gas process to provide improved granularity compared to the national level factors currently in place.

It considers the level of data and calculations currently used, and the changes that would be required for the AUGES to generate LDZ level factors. Consideration is also given to the impact on industry participants including the CDS and code parties.

An assessment of the implementation of LDZ level factors is also given.

2 SUMMARY OF CALCULATIONS

2.1 Existing Calculations

The existing Unidentified Gas calculations use some data split by LDZ, and at present these are aggregated to the national level for factor calculation. Where this is the case, the update required is to extend the factor calculation methodology to use the LDZ-by-LDZ information and to create 13 sets of factors, one per LDZ.

For other data there is currently no split by LDZ and so the underlying calculation methods will have to be updated to incorporate this split. The current level of granularity for each data type is shown in the table below. The table below shows data types that require changes to the calculation method to include a split by LDZ and are shown in red.

Data Type	Current Granularity	Comment
Consumption Method (total Unidentified Gas estimate)	LDZ	
Allocations	LDZ	
Corrections (Unique Sites, DM, LDZ)	LDZ	
Shipperless/Unregistered sites	LDZ / Product Class / EUC	
Consumer Meter Errors	LDZ / Product Class / EUC	
Detected Theft	LDZ / Product Class / EUC	
CSEPS	LDZ / Product Class / EUC	
Detected Theft	LDZ / Product Class / EUC	
Undetected Theft	Product Class / EUC	
Pressure Correction	National	
Temperature Correction	National	Currently set to zero
Balancing Factor	National	

2.2 Changes Required to Support LDZ Level Factors

Updating the factor calculations to work by LDZ and output 13 sets of factors is relatively straightforward, and this will cover the first 7 data types listed in the table above. The largest piece of work associated with this is carrying out the factor smoothing and Quality Assurance on 13 sets of factors instead of one.

The four data types where fundamental changes to calculations are required, and the issues associated with each, are listed below.

Undetected Theft

The TRAS data supplied to the AUGE contains dummy MPRN, which can be used to query the LDZ for each theft from the asset data. The undetected theft analysis can therefore be updated to work on an LDZ by LDZ basis.

Pressure Correction

As of the 2020/21 analysis, calculations are carried out at the LDZ level. This output can therefore be incorporated into the calculation process for LDZ level factors as required.

Temperature Correction

The AUGE is currently carrying out analysis on the effect of meter temperature on UIG. This analysis is being done at LDZ level, but results will be aggregated to obtain the national effect. If required, the LDZ results would be available. The temperature analysis (at the aggregate level) is documented in the 2020/21 AUG Statement.

Balancing Factor

The ability to split the Balancing Factor by LDZ is a natural consequence of calculating all the other component parts of the analysis at this level.

3 MATERIALITY

A critical consideration when assessing the impact of LDZ level factors is whether there is likely to be a material difference between the factors for different LDZs. A full assessment of the variation in factors for different LDZs would require the complete LDZ-level calculation system to be implemented, which is not practical at this stage of the process. Therefore, a more limited analysis has been carried out based on the following principles:

- The vast majority of variation between LDZs will derive from differences in pressure and temperature corrections, and in theft patterns between LDZs.
- The majority of the impact will be seen in the largest UIG market sector, which is PC4 EUC 01B.

Therefore, an analysis was carried out based on the range of UIG(f) values across LDZs for the combination of pressure/temperature corrections and theft, for PC4 01B only. The primary output of this work is the percentage of UIG(f) that is assigned to PC4 01B in each LDZ, and from this the range of such percentages that are observed to occur. The likely impact on the factors of values at the extremes of this range is then assessed.

The analysis consisted of the following steps:

1. Calculate the total UIG(f) for each individual LDZ, using the average figure across a 6-year training period.
2. Calculate the UIG(f) total due to pressure and temperature corrections for each LDZ. From this, calculate the UIG(f) from this source that is assigned to PC4 01B (based on a split by throughput of sites without converters for this UIG type).
3. Calculate the UIG(f) total due to undetected theft for each LDZ. From this, calculate the UIG(f) from this source that is assigned to PC4 01B (based the Balancing Factor split for this UIG type).
4. Add these two figures for each LDZ to give the combined UIG(f) from these sources for PC4 01B. Express this as a percentage of the total UIG(f) for each LDZ calculated in Step 1 above.

5. Calculate the effect on the UIG factors of PC4 01B percentages in this range.

The table below shows the calculation results at each key stage and the final results from this analysis.

LDZ	UIG(f)	Temp/Pressure		Undetected Theft		Combined	PC4 01B
	Total	Total	PC4 01B	Total	PC4 01B	PC4 01B	Percentage
EA	806.6	135.7	96.47	670.9	604.8	701.30	86.9%
EM	797.4	175.3	124.58	622.2	605.7	730.33	91.6%
NE	662.6	107.4	76.32	555.2	532.1	608.41	91.8%
NO	448.9	77.6	55.13	371.3	344.5	399.64	89.0%
NT	759.7	-199.9	0.00	959.5	882.7	896.24	93.4%
NW	904.0	186.9	132.80	717.2	657.5	790.30	87.4%
SC	418.5	143.8	102.22	274.7	245.0	347.20	83.0%
SE	431.3	-98.5	0.00	529.8	509.6	509.56	96.2%
SO	539.4	84.0	59.72	455.4	447.6	507.35	94.1%
SW	326.3	152.3	108.27	173.9	151.5	259.77	79.6%
WM	418.7	175.0	124.40	243.7	218.8	343.20	82.0%
WN	110.2	31.5	22.39	78.7	77.9	100.32	91.1%
WS	363.6	13.1	9.32	350.5	327.0	336.69	92.6%

This table shows that the differences between LDZs result in the percentage of UIG(f) assigned to PC4 01B varying between a minimum of 76.6% (for SW LDZ) and a maximum of 96.2% (for SE LDZ). This range in the magnitude of UIG(f) for PC4 01B has a direct effect on the factors. This effect has been simulated using the Unidentified Gas factor calculation algorithms and has been shown to be approximately $\pm 20\%$. Therefore, for example, if the national factor for PC4 01B was 100, the LDZ factors would be likely to range between 80 and 120 for this market sector.

Given the magnitude of UIG(f), this range in factors corresponds to a considerable energy value of gas, and hence a considerable amount of money. We therefore conclude that the likely variation in factors from LDZ to LDZ is material.

4 INDUSTRY IMPACT

The three major industry players affected by a change to LDZ-level factors are the AUGÉ, the CDSP and code parties. The impact on each is summarised below.

AUGÉ

The AUGÉ's calculation systems for Undetected Theft, Pressure Correction, Temperature Correction and the Balancing Factor will have to be updated to function at the LDZ level. Factor calculations will have to be updated to accept this new level of data and produce 13 sets of factors instead of one. Factor smoothing and quality assurance will have to be carried out on all 13 sets. We estimate that all the above will take a total of 20 FTE-days effort to initially implement and then up to a further 5 FTE-days effort per year thereafter to produce the larger set of factors and quality check. (The calculations/processing will mostly be automated, but there will be more data to validate and more factors to verify).

CDSP

The CDSP will have to verify whether their settlement system is currently able to hold individual tables of factors for each LDZ, and to look up the correct factors for each LDZ during calculations. If this capability is not currently present, the system will have to be updated to include it. We understand the CDSP will need to carry out an impact assessment including a test phase for any subsequent implementation.

Code Parties

A Network Code Modification would be required to amend the UIG factors table to include LDZ level factors, as the format is set out in UNC section E rather than in the "Framework for the Appointment of an AUGÉ" document. This will have to be proposed by a code party. Code parties may need to update their systems to account for LDZ level factors (e.g. modelling of portfolio costs etc). Feedback on potential changes will be requested.

5 UIG PROCESS IMPACT

It should be noted that total UIG is already apportioned at an LDZ level. However, the factors used to split the total UIG by EUC and product class are currently the same for all LDZs. Implementing different UIG factors by LDZ will allow the split of UIG between different EUCs and product classes to vary by LDZ but will not change the total amount of UIG in each LDZ.

The key impacts on the UIG calculation processes of changing to LDZ level factors are as follows:

- LDZ level factors will show differences in the pattern of factors from LDZ to LDZ. The key contributors to these differences will be:
 - Any differences in theft patterns between LDZs.
 - Differences in average gas temperature between LDZs.


We believe that the dominant effect will be temperature, and as such we recommend that LDZ level factors should only be used in conjunction with a non-zero temperature correction.

- A successful implementation of LDZ level factors will lead to a more accurate assignment of UIG to EUCs and Product Classes in each region of the country.
- There will be greater transparency in terms of where UIG arises from which may allow targeted effort to reduce UIG in these areas
- There may be commercial impacts on consumers if UIG costs are distributed regionally by suppliers.
- UIG is produced at an LDZ level, the LDZ factors will refine how that is distributed across product classes by LDZ but will not move UIG between LDZs.

6 CONCLUSIONS/RECOMMENDATIONS

From a technical perspective, we conclude that the calculation of UIG factors by LDZ is viable and relatively straightforward for the AUGÉ to implement, and that the variation in factors between LDZs is likely to be material.

LDZ level factors have the potential to provide a more accurate split of UIG by EUC and Product Class for each region of the country, but this benefit will only be realised in full if a non-zero temperature



correction effect is also implemented. This is made feasible through DNV GL's access to the Gas Temperature Survey report GRTC R3895, and this is part of the 2020/21 factor calculation analysis.

CDSP system changes may be required in order to support LDZ level UIG factors, and as a minimum testing of the system to ensure that it functions correctly on an LDZ by LDZ basis will be required.

The following recommendations are made:

- The CDSP should assess what changes (if any) and testing will be required concerning their settlement system and the costs associated with this.
- Code parties should assess the potential impact on their systems and processes.
- Subject to satisfactory outcomes of these assessments, a code party should sponsor a UNC modification covering the implementation of LDZ level factors.



About DNV GL

DNV GL is a global quality assurance and risk management company. Driven by our purpose of safeguarding life, property and the environment, we enable our customers to advance the safety and sustainability of their business. We provide classification, technical assurance, software and independent expert advisory services to the maritime, oil & gas, power and renewables industries. We also provide certification, supply chain and data management services to customers across a wide range of industries. Operating in more than 100 countries, our experts are dedicated to helping customers make the world safer, smarter and greener.