Large NDM Load Factors Presentation to DN Charging Methodology Forum

28th June 2016

Objective

- Project Nexus Implementation requires some changes to the Load Factor formula used for Large NDM EUCs

- The following slides explain the proposed changes
  - To give as much advance warning of changes as possible

  - To clarify benefits while mitigating potential impacts

  - To make changes applicable from 01/10/16 easier to understand
    - These changes will be implemented in October, regardless of Project Nexus implementation

Jargon Buster

- ALP – Annual Load Profile (used in NDM Daily Nomination / Allocation)
- AQ – Annual Quantity
- CWV – Composite Weather Variable
- DAF – Daily Adjustment Factor (used in NDM Daily Nomination / Allocation)
- DESC – Demand Estimation Sub-committee (UNC Forum)
- EUC – End User Category (grouping of meter points based on LDZ, AQ and winter consumption level)
- LDZ – Local Distribution Zone
- MWh – 1,000 kWh
- NDM – Non-Daily Metered
- PLF – Peak Load Factor (for determining SOQs)
- SOQ – System Offtake Quantity (Peak Day Load)
- TWG – Technical Workgroup (of DESC)

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Demand Estimation Sub-Committee Background

- Demand Estimation Sub-Committee is a Sub-Committee of UNCC

- Membership of 5 Transporters and (up to) 5 Shippers

- Fulfils a number of obligations set out in UNC section H including:

    - Overseeing development of the NDM Demand Models – ALPs/DAFs/Peak Load Factors

    - Periodic review of Seasonal Normal Composite Weather Variable and CWV definitions

    - Development or revision of the End User Category (EUC) definitions

    - Determination of the 1 in 20 peak day demand

- Meets at least 4 times a year – facilitated by Joint Office

- Meetings are open to any industry parties

- DESC delegates detailed discussion to a Technical Workgroup

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NDM Peak Load Factors Background

- NDM Peak Load Factors are reviewed each year and are derived from the underlying NDM Demand Models

- Peak Load Factor is used to derive an SOQ from an AQ:
  $$SOQ = AQ/(365 \times PLF)$$

- Current method (up to Gas Year 2015/16):
  - Small NDM (up to EUC04 – AQs up to 2,196 MWh)
    - Calculated by simulation from the individual EUC Demand Model
  - Large NDM (EUC05 upwards – AQs above 2,196 MWh)
    - Derived from a model of seasonal normal and peak day Aggregate NDM Demand in the LDZ, plus the ALPs and DAFs for the EUC

Background to the Difference in Approach

- Small NDM (up to EUC04) makes up almost 90% of total NDM AQ

- Large NDM (EUC05 and above) makes up just over 10% of AQ but almost two thirds of the EUCs by number

- Previously processing power was limited and the Large NDM approach to PLFs saved considerable processing capacity

Why Change?

- There are currently 2 inconsistent approaches

- 2 sets of calculation code need to be maintained

- Approach to Large NDM is currently less specific and less accurate

- NDM LDZ Aggregate Demand Model is not required for any other processes post-Nexus – change to Large NDM PLFs could remove the need altogether

- Increased processing capacity is now readily available, so Large NDM could also be calculated by individual EUC simulation

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Planned Change to PLF calculation

- Was proposed and supported at DESC Technical Workgroup meeting in January

- Was approved at DESC in February

- Has been incorporated into Spring Approach to NDM Algorithms for Gas Year 2016

- Is being communicated to interested parties:
  - Gas Transporter Pricing Managers already briefed
  - NTS Charging Methodology Forum – briefed in April
  - Distribution Network Charging Methodology Forum – June

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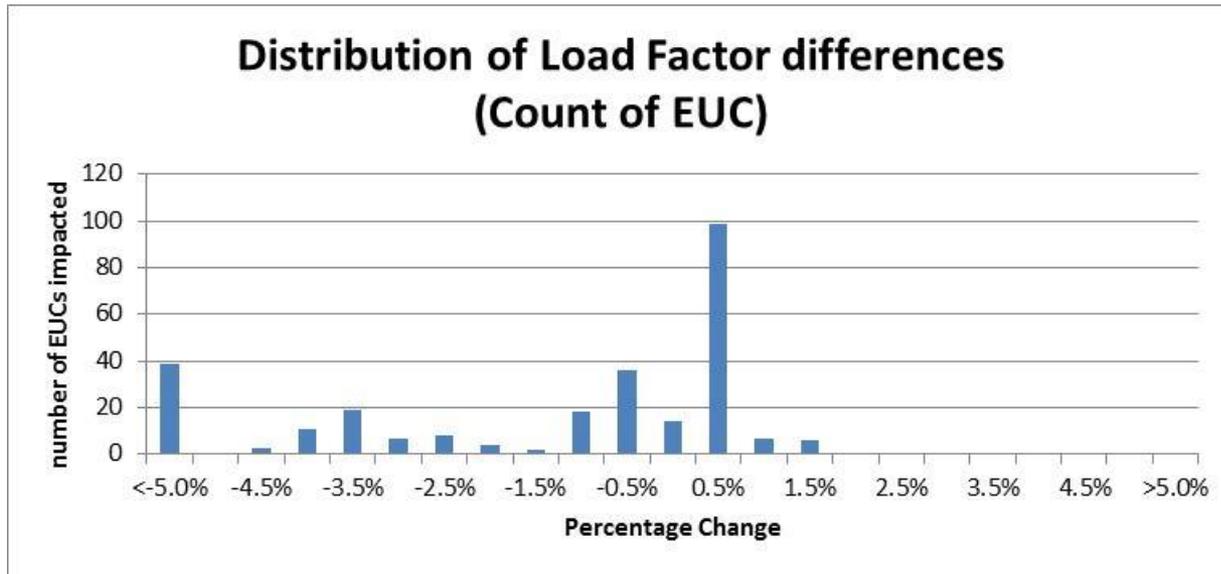
Summary of Impacts of Change

- PLFs for Small NDM EUCs are not affected – no change

- PLFs for Large NDM EUCs will be more accurate, will better reflect weather sensitivities

- PLFs have been recalculated for Gas Year 2015 using the new approach for comparison purposes

- Some PLFs will increase, some will decrease

- Two thirds of movements are within +/- 1.5 of current value
  - E.g. Current PLF 46.4%, revised value 45.2%, change of -1.2

- In general a higher PLF means a lower SOQ, lower PLF means higher SOQ

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Impact on Peak Load Factors 2

- Overall Large NDM currently represents 12% of the market by volume

- Network Pricing managers estimate that overall NDM LDZ total SOQs will increase by between 0.1% and 0.2%

- Following slide summarises the change in PLF grouped by magnitude

  - NOTE: these are not the sole changes that will take place in Oct 2016 (AQ review, normal movement in PLFs etc. will also occur)

  - Differences are in numerical terms, e.g. current 63.3%; revised 61.9% = difference of -1.4

- Estimated impacts of this change only for each EUC are set out in a spreadsheet published along with this presentation

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Estimated Impact on Peak Load Factors

- Differences in load factors between current and revised approaches have been calculated using 2015/16 as a template

- The distribution of differences is as follows:

Distribution of Load Factor differences (Count of EUC)

Note differences are in numerical terms,
e.g. current 63.3%; revised 61.9% = difference of -1.4

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Next Steps

- These changes have been included in the approach to Spring Modelling for Gas Year 2016

- Implementation of these changes will be made for Gas Year 2016 onwards

- Part of the movement in Large NDM PLFs for Gas Year 2016 will be attributable to change in approach to calculation

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Benefits

- The benefits of this change include:

  - Large NDM load factors will be calculated in a manner consistent with the Small NDM load factors

  - It will give more accurate answers by taking into account the specific weather sensitivities of that EUC in determining the 1 in 20 peak demand through simulation

  - We will no longer need to maintain the LDZ NDM Aggregate demand models (an unnecessary overhead and also artificial in a post-Nexus world).

Where to go for more information

- More detail on the calculations are set out in following 2 slides

- Can also be found in the NDM Algorithm Booklet for 2015 – available on Xoserve secure website

- 2016 Booklet will highlight the change of approach

- Minutes of DESC and TWG meetings are available on Joint Office Website

- Proposed PLFs for October 2016 will be published for industry review in early July

- DESC and TWG members listed on Joint Office DESC pages

- Xoserve Demand Estimation team can be contacted via Xoserve.demand.estimation@xoserve.com

Appendix – Current Approach – More detail

- The current approach for Large NDM is described in Appendix 10 of the NDM Algorithms Booklet.

- Peak Load Factor (PLF) = $\dfrac{1}{ALP_t * (1+WCF_p * DAF_t)}$

  where the ALP and DAF values are those relating to the day_t of maximum seasonal normal aggregate NDM demand in the LDZ

- $WCF_p = (PDN/SNDN_m) - 1$
  where PDN = 1 in 20 peak day aggregate NDM demand for LDZ
  and $SNDN_m$ = maximum seasonal normal aggregate NDM demand

- Note: the WCF_p is at LDZ level (not EUC) and in the pre-Nexus formula the DAF is the EUC model attributes relative to the aggregate NDM model

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Appendix – Proposed Approach – More detail

- The new approach will be to follow the process as described for Small NDM in Appendix 10 of the NDM report but for Large NDM EUCs

- The Large NDM EUC Load Factor calculation will be:

$$\frac{\text{Aggregate AQ from EUC model}}{\text{1 in 20 peak demand simulated from the EUC model} \times 365}$$

- Where 1 in 20 peak day demand estimate is derived from each Large NDM EUC model by simulation, using the smoothed EUC demand model in conjunction with the database of historic daily composite weather variable values for the appropriate LDZ.

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