Project Nexus

Options for Interim AQ Tolerance Check
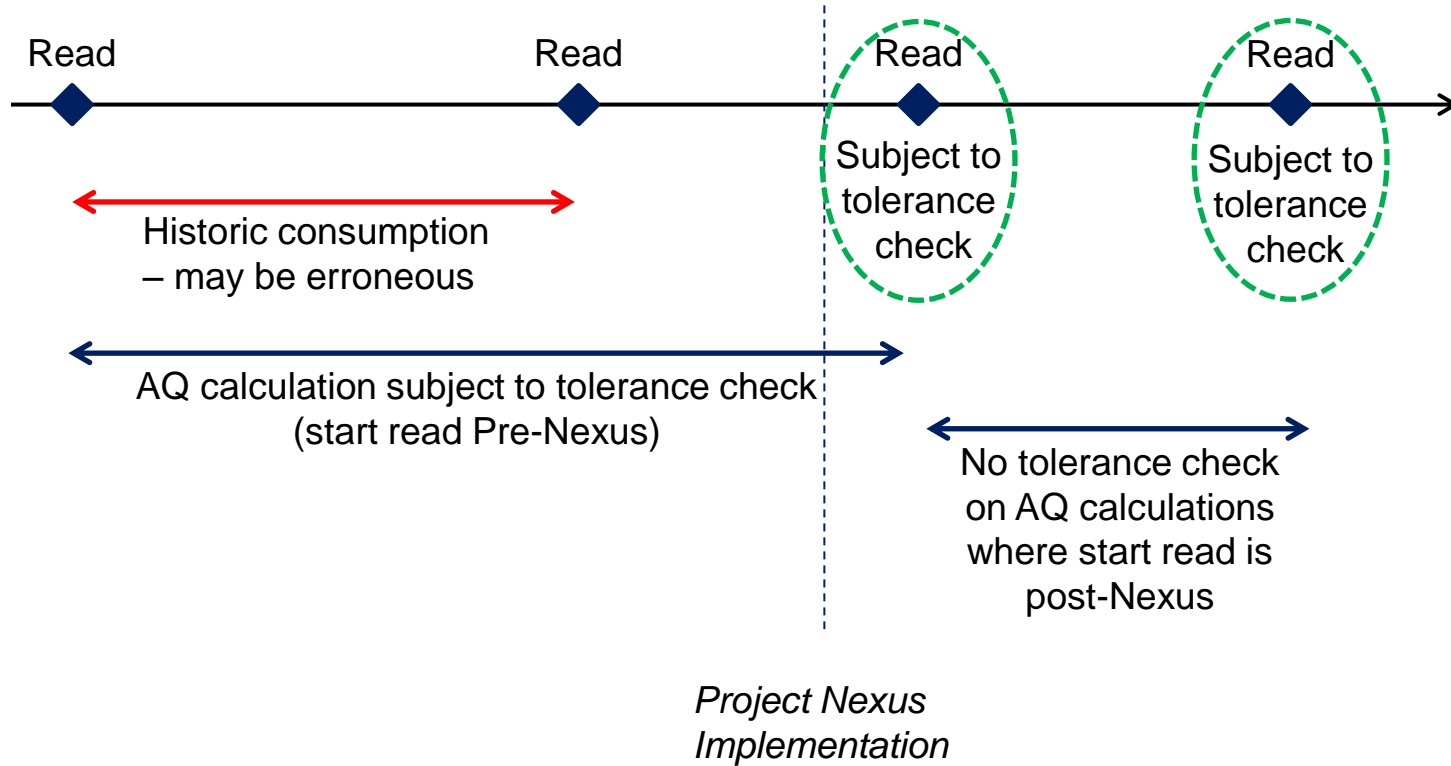
12 May 2015

Background to Analysis

- Concerns about outcome from Rolling AQ calculation for an interim period

- New meter readings subject to AQ/SOQ based tolerances

- Start read for AQ calculation may be pre-Nexus – erroneous read/consumption could inflate the AQ

- AQ goes live following month – no Amendment process

- Proposal for an additional AQ tolerance check for an interim period only

- Tolerances applied only where start read is pre-Nexus …

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Read   Read   Read   Read

Historic consumption – may be erroneous

Subject to tolerance check

Subject to tolerance check

AQ calculation subject to tolerance check (start read Pre-Nexus)

No tolerance check on AQ calculations where start read is post-Nexus

Project Nexus Implementation

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# Scope of proposed interim tolerance check

- In scope
  - AQ increases following monthly system calculation
  - SSP to LSP increases
  - LSP to LSP increases
  - Start read date is pre-UKLink Replacement go-live

- Out of scope
  - AQ decreases (or unchanged) following monthly system calculation
  - AQ increases but stays within SSP
  - Start read date is post-UKLink Replacement go-live
  - AQ corrections (post-Nexus process)

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Analysis undertaken

- Analysed all 2013 and 2014 AQ calculations where initial outcome was an increase:
  - LSP to LSP
  - SSP to LSP
- Within SSP excluded
- Compared initial increase to final outcome following Xoserve and Shipper investigations
- 2015 AQ Review excluded – final outcomes not yet known

March   *October*
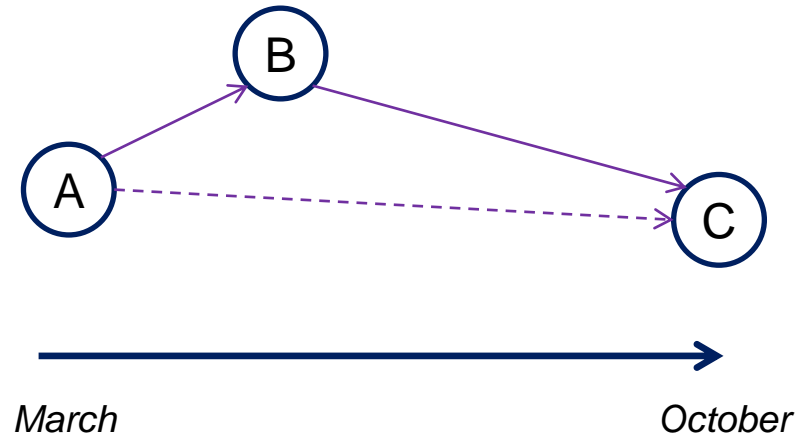
A = Previous live AQ, prior to re-calculation

B = System calculation - revised AQ

C = New Gas Year AQ, following Xoserve and Shipper investigations

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WITHIN LSP INCREASES – RESULTS

Within LSP AQ Changes – Results

- Compared eventual outcomes after Xoserve and Shipper investigations (including Amendment phase) to assess accuracy of initial calculations

- Results shown are "worst case" – data quality should be better after migration to new UKLink – impossible to quantify impact of data cleansing

- For different % tolerances based on confidence levels

  – Assessed potential number of rejections per 1000 calculations – based on initial AQ calculations in 2013 & 2014 (A to B)

  – Assessed potential number of false acceptances per 1000 calculations – based on no. of subsequent reductions (A to C)
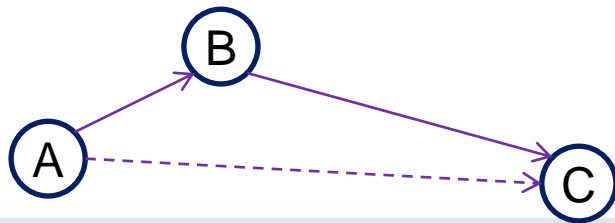
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LSP to LSP – Options for Tolerance levels

Confidence level	Cut-off level - % increase in AQ	Worst case false acceptances per 1000	Worst case number of rejections per 1000
50%	11.06%	0.20	69
80%	27.21%	1.50	37
85%	33.76%	1.90	34
90%	45.68%	2.40	32
92%	54.54%	2.60	31
95%	86.72%	2.90	30
96%	116.00%	3.00	30
99%	2301.04%	3.40	29

- Results shown are "worst case" – data quality should be better after migration to new UKLink – impossible to quantify impact of data cleansing
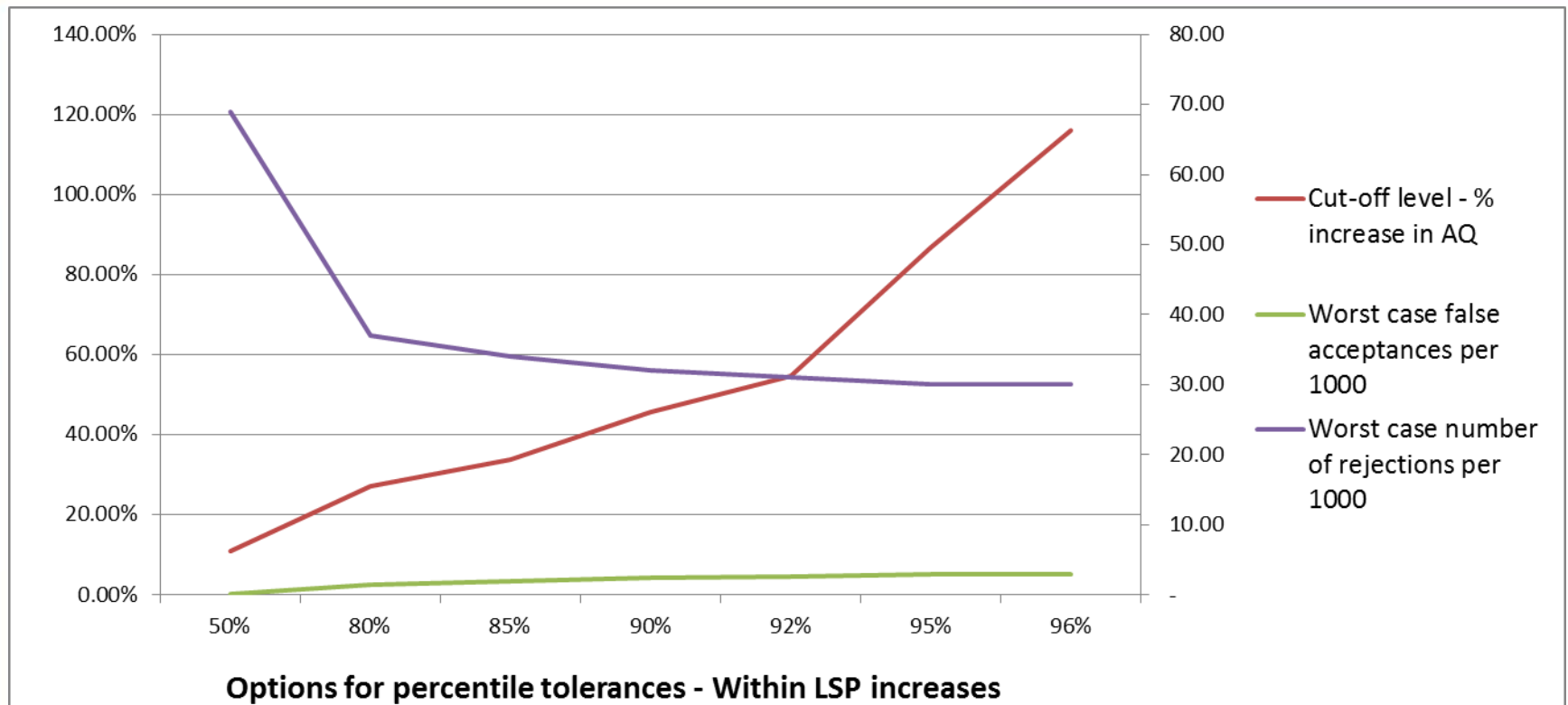
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LSP to LSP – Comparison of Options

Options for percentile tolerances - Within LSP increases

Legend:
- Cut-off level - % increase in AQ
- Worst case false acceptances per 1000
- Worst case number of rejections per 1000

Xoserve Recommendation – within LSP increases

- Recommendation – tolerance level set at 100% increase for within LSP changes
  - round number
  - easy to understand and replicate
- Equates to 95.5% confidence level
- Estimate of 30 rejections per 1000, 3 false acceptances

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SSP TO LSP INCREASES – RESULTS

SSP to LSP Increases – Initial Assessment

- Much greater volatility of change amongst SSP to LSP Threshold Crossers

- Reviewed 2013 and 2014 Threshold Crossers – based on initial system calculation

- Sub-divided population using proposed Read Tolerance Sub-Bands (PN UNC 10th March)

- All sub-bands show big initial increases, mostly reduced subsequently by Xoserve and Shipper investigations …

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2013 & 2014 Initial Threshold Crossers

Initial AQ (kW ▾	Average % Diff after system calc	Max% Diff after system calc	Average % Diff after amendments	Max % Diff after amendments
1	347,107,910%	479,125,224,900%	132,579,301%	43,032,529,800%
2-200	6,137,949%	1,779,627,953%	28,937%	13,057,500%
201-500	382,629%	53,696,571%	1,579%	401,999%
501-1000	235,570%	397,361,491%	574%	201,793%
1001-5000	45,445%	30,383,926%	121%	144,957%
5001-10,000	14,672%	4,779,482%	13%	31,888%
10,001-20,000	7,015%	5,393,254%	4%	33,624%
20,001+	3,849%	78,899,108%	23%	39,128%

A to B

A to C

proposed Read Tolerance Sub-Bands (PN UNC 10th March)

B

A

C
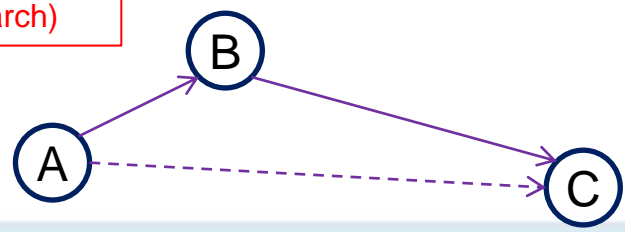
SSP to LSP – Example Tolerance

- High volatility means either high rejections or high false acceptances at any tolerance level – example at 99.5% confidence level

- Lower tolerances would mean 100% rejection in some sub-bands

Initial AQ (kWh)	Cut-off level - % increase in AQ	Worst case false acceptances per 1000	Worst case number of rejections per 1000
1	3,253,186,230%	495	11
2-200	1,261,671%	528	454
201-500	71,535%	208	779
501-1000	22,838%	148	840
1001-5000	5,825%	138	857
5001-10,000	826%	8	991
10,001-20,000	462%	15	979
20,001+	497%	157	600

- Results shown are "worst case" – data quality should be better after migration to new UKLink – impossible to quantify impact of data cleansing

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SSP to LSP Increases – Alternative Approach

- No obvious answer to a tolerance % at any confidence level – rejections + false acceptances close to 1,000 for most sub-bands

- Alternative approach – determine a maximum acceptable financial exposure – set tolerance to prevent an AQ increasing above that level

- E.g. agree a maximum average exposure of [£500] of energy allocation for a month = max AQ of [300,000 kWh] based on 2p/kWh

- Set % tolerance levels to prevent any AQ increasing above that level

Example 1 – SSP to LSP – max exposure £500

Target revised max AQ			300,000	
Estimated max monthly energy allocation		£	500	2 p/kWh

Initial AQ (kWh)	Percentile Threshold	Cut-off level - % increase in AQ	Worst case false acceptances per 1000	Worst case number of rejections per 1000
1	0.31	29,999,900%	139	694
2-200	0.09	149,900%	83	910
201-500	0.18	59,900%	165	824
501-1000	0.21	29,900%	196	793
1001-5000	0.14	5,900%	141	856
5001-10,000	0.17	2,900%	169	829
10,001-20,000	0.17	1,400%	159	835
20,001+	0.34	310%	106	660

- Results shown are "worst case" – data quality should be better after migration to new UKLink – impossible to quantify impact of data cleansing

- Actual monthly exposure depends on weather and time of year

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Example 2 – SSP to LSP – max exposure £800

Target revised max AQ			480,000	
Estimated max monthly energy allocation		£	800	2 p/kWh

Initial AQ (kWh)	Percentile Threshold	Cut-off level - % increase in AQ	Worst case false acceptances per 1000	Worst case number of rejections per 1000
1	0.42	47,999,900%	198	584
2-200	0.16	239,900%	147	844
201-500	0.29	95,900%	274	713
501-1000	0.32	47,900%	308	680
1001-5000	0.25	9,500%	241	754
5001-10,000	0.30	4,700%	295	703
10,001-20,000	0.31	2,300%	300	694
20,001+	0.42	556%	173	584

- Higher tolerances – fewer rejections

- Actual monthly exposure depends on weather and time of year

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Xoserve Suggestion for SSP to LSP changes

- Erroneous AQs calculated by monthly system process can be corrected by read submission in time for following month's calculation, so …

- Identify a maximum acceptable financial exposure for a month

- Set % increase tolerances by sub-Band so that revised AQ can never be above that level

- Tolerance levels will be parameterised – could be amended easily if industry agreed new values after first few months of calculations

- Consider possible level of rejections when setting tolerances

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