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Mod0407 UNCC Workgroup Meeting
12th December 2012 – Tony Perchard & Brian Kruger

www.gl-nobledenton.com

Introduction

Design Margin - Assumes 2 hour, 5% rule compliance

- Quantify deviation from rule
- Assess impact in terms of resultant NTS linepack changes

Data Used

- All accepted OPNs
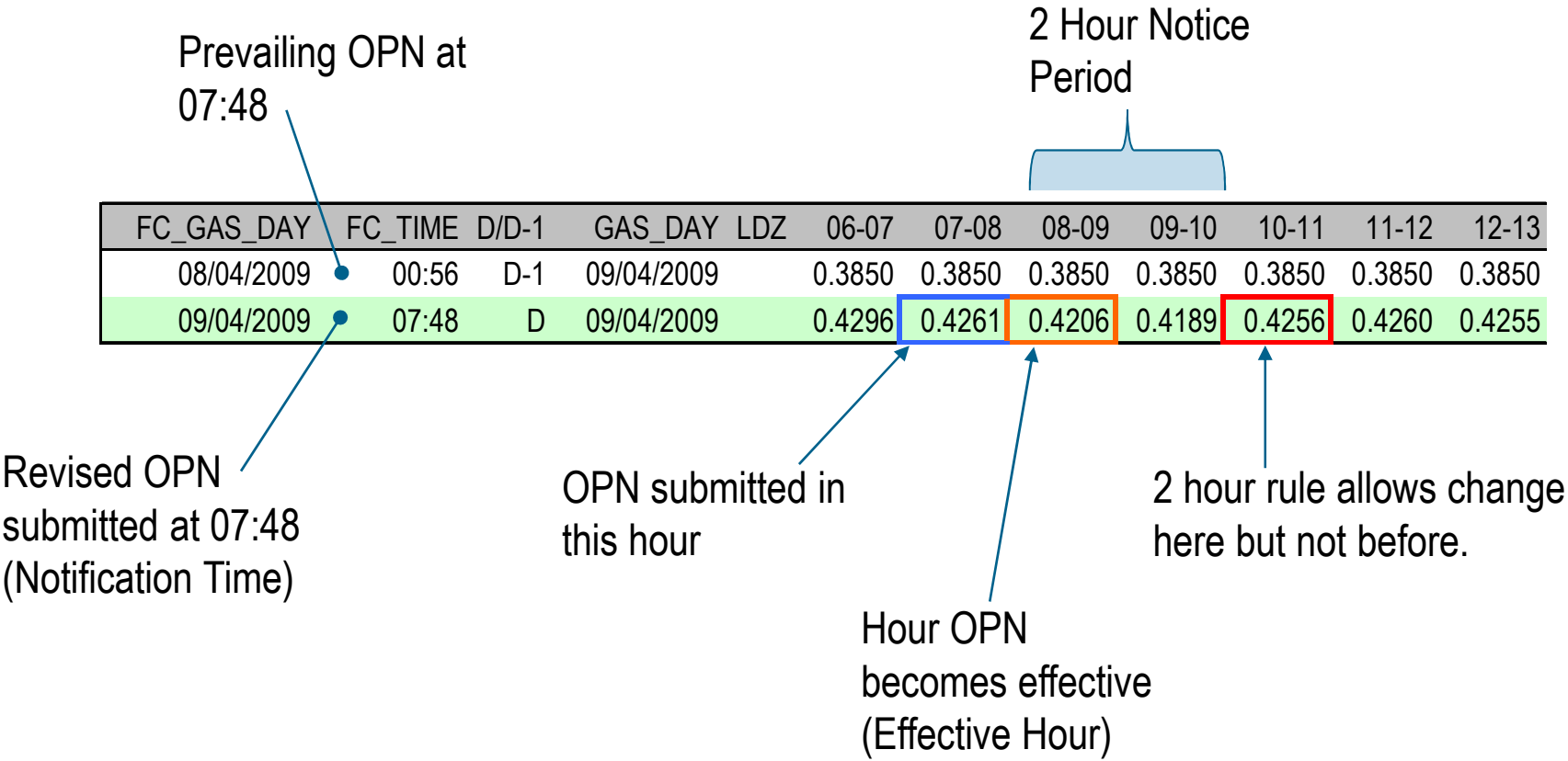- Actual volumes
- 5 April 2009 – 30 June 2012

Current 2hr/5% Rule

- Applies at LDZ Level (aggregate of LDZ offtakes)

- Applies to all OPNs except first submitted

- Applies to both increases and decreases in flow rate

- Initial OPN must be submitted by 18:00D-1
  - Prevailing OPN for today at 18:00 used as D-1 OPN for tomorrow if not submitted

Terminology

- Notification Time
  - Timestamp of OPN entered at GNCC

- Effective Hour
  - Next hour bar after notification time – OPN becomes prevailing OPN

- Notice Period
  - The 2 hour period starting at the effective hour

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Current 2hr/5% Rule

Prevailing OPN at 07:48

2 Hour Notice Period

FC_GAS_DAY	FC_TIME	D/D-1	GAS_DAY	LDZ	06-07	07-08	08-09	09-10	10-11	11-12	12-13
08/04/2009	00:56	D-1	09/04/2009	0.3850	0.3850	0.3850	0.3850	0.3850	0.3850	0.3850
09/04/2009	07:48	D	09/04/2009	0.4296	0.4261	0.4206	0.4189	0.4256	0.4260	0.4255

Revised OPN submitted at 07:48 (Notification Time)

OPN submitted in this hour

2 hour rule allows change here but not before.
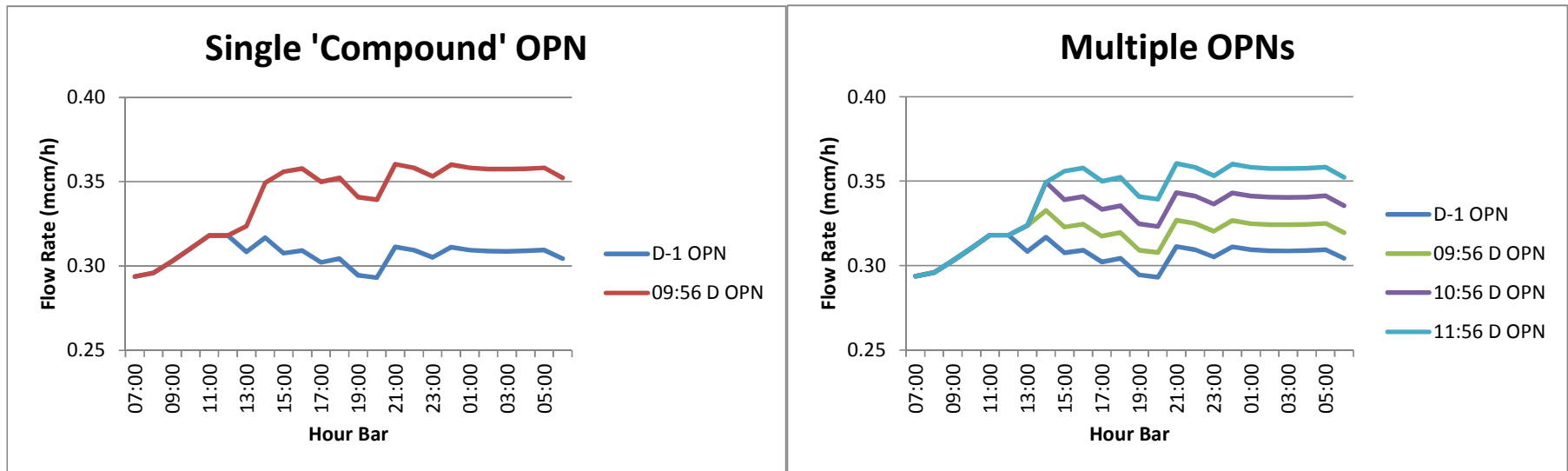
Hour OPN becomes effective (Effective Hour)

Current 2hr/5% Rule Example

First D OPN at 09:56

- Effective from 10:00

- First Change in hour bar 12:00-13:00
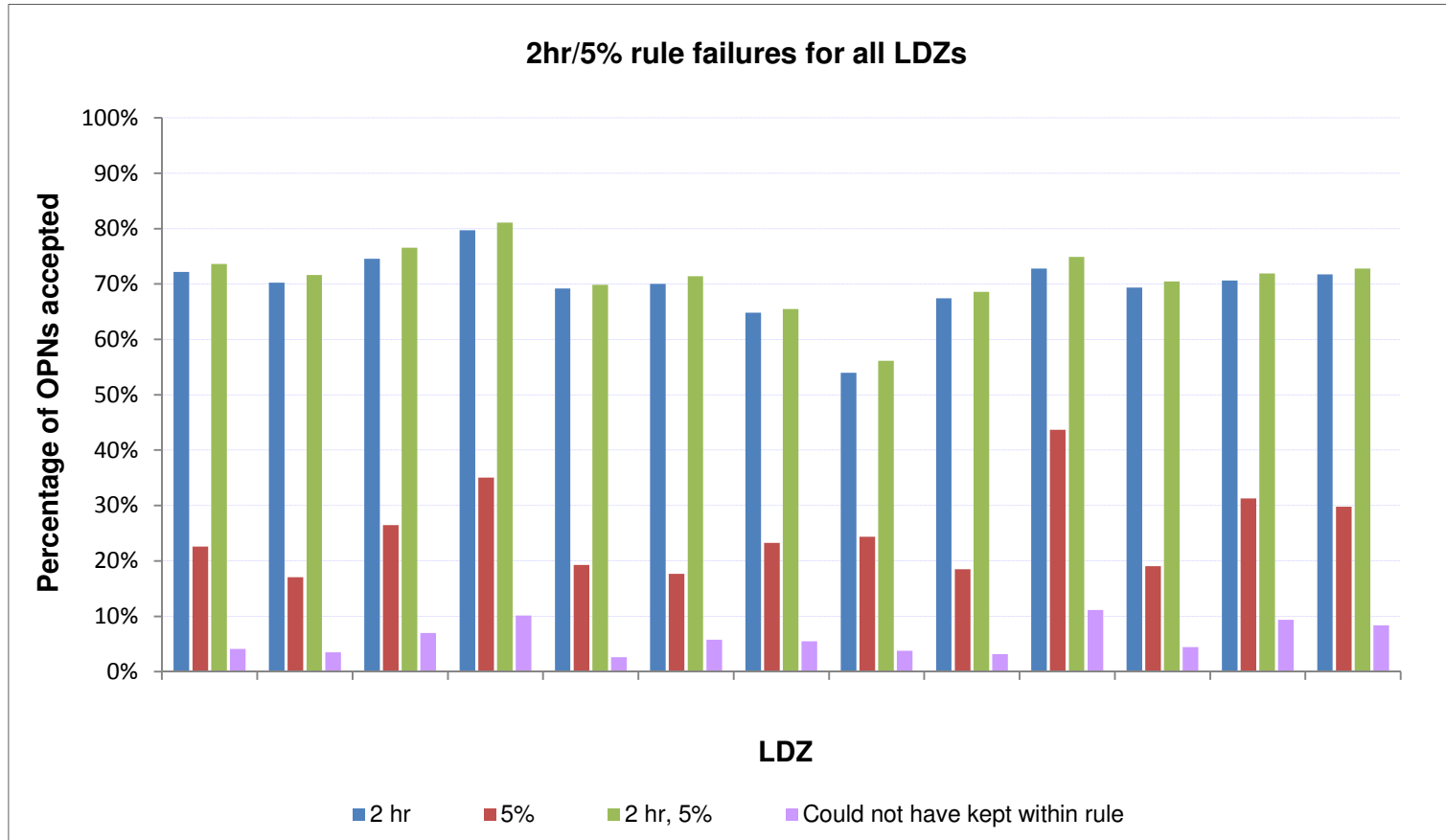
Compound 5% change per hour
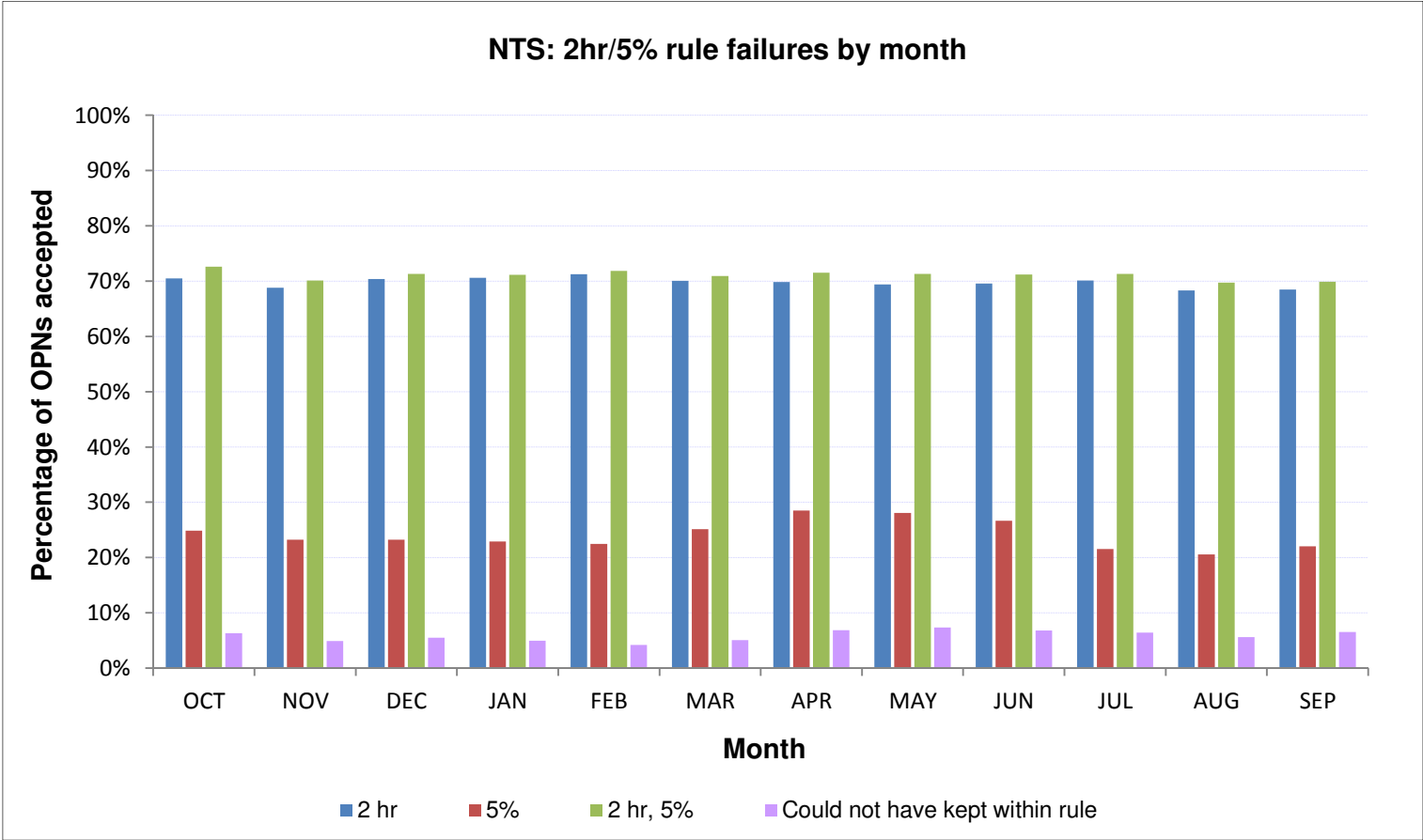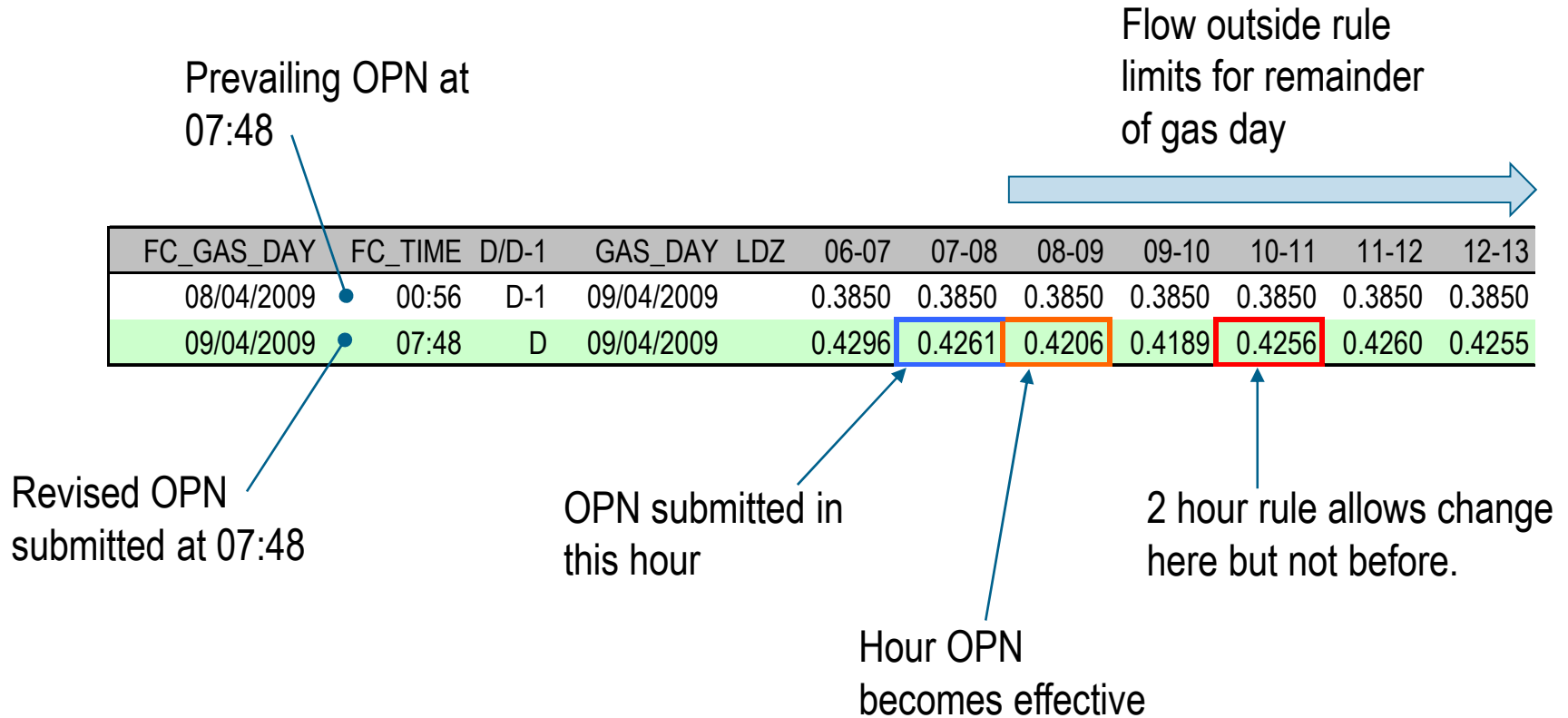
Current Performance vs Rule

How often is rule broken?

- 2hr - Failure to give 2 hour notice of change
- 5% - Exceeds 5% change after end of notice period
- 2hr, 5% - Overall rule broken
- Could not have kept within rule and achieved same EOD volume

Rule Breaches by LDZ

2hr/5% rule failures for all LDZs

Y-axis: Percentage of OPNs accepted

X-axis: LDZ

Legend: ■ 2 hr ■ 5% ■ 2 hr, 5% ■ Could not have kept within rule

Rule Breaches by Month

NTS: 2hr/5% rule failures by month

Legend: ■ 2 hr ■ 5% ■ 2 hr, 5% ■ Could not have kept within rule

X-axis (Month): OCT, NOV, DEC, JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP

Y-axis: Percentage of OPNs accepted (0% – 100%)

Current Performance vs Rule

How often is rule broken?

- 2hr - Failure to give 2 hour notice of change
- 5% - Exceeds 5% change after end of notice period
- 2hr, 5% - Overall rule broken
- Could not have kept within rule and achieved same EOD volume

How much is rule broken by?
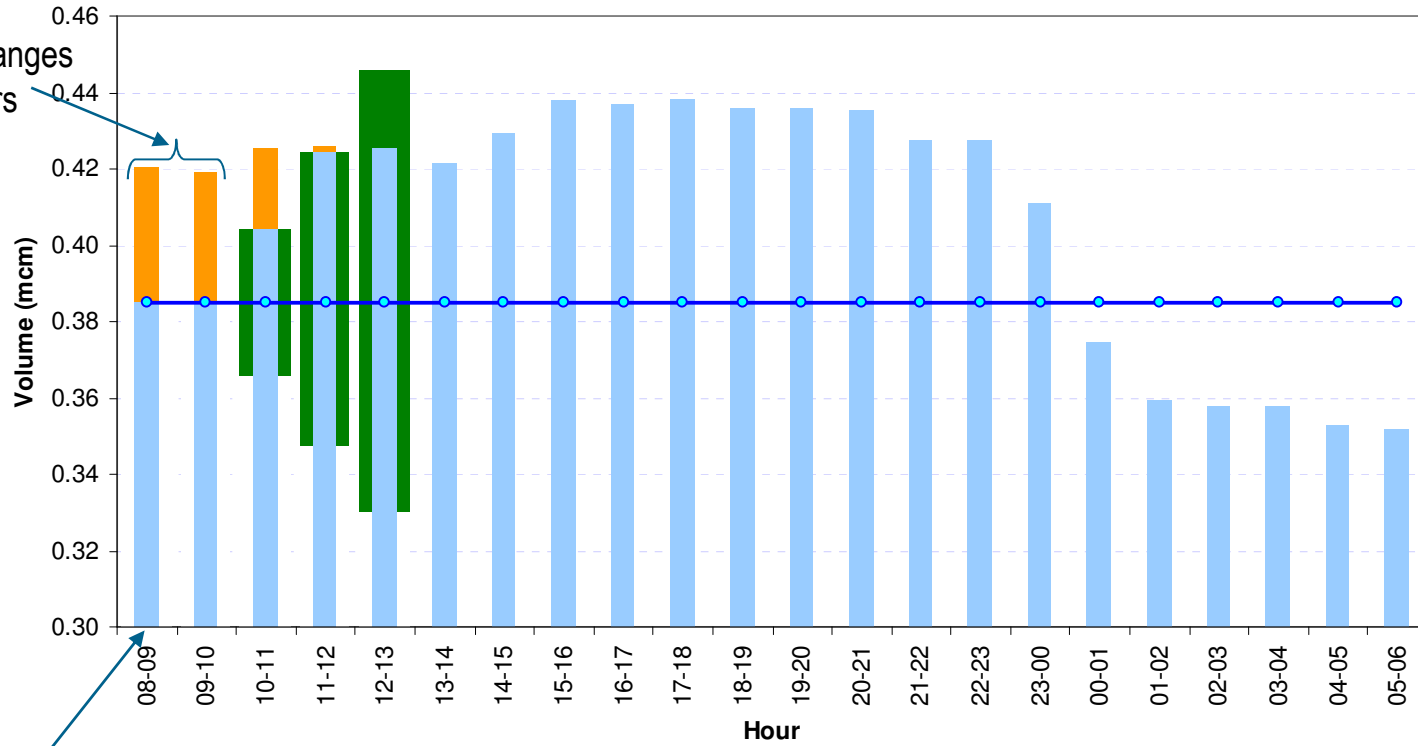
- **NTS Linepack Depletion effect**

Calculation of NTS Linepack Depletion

Prevailing OPN at 07:48

Flow outside rule limits for remainder of gas day

FC_GAS_DAY	FC_TIME	D/D-1	GAS_DAY	LDZ	06-07	07-08	08-09	09-10	10-11	11-12	12-13
08/04/2009	00:56	D-1	09/04/2009	0.3850	0.3850	0.3850	0.3850	0.3850	0.3850	0.3850
09/04/2009	07:48	D	09/04/2009	0.4296	0.4261	0.4206	0.4189	0.4256	0.4260	0.4255

Revised OPN submitted at 07:48

OPN submitted in this hour

2 hour rule allows change here but not before.

Hour OPN becomes effective

Calculation of NTS Linepack Depletion (continued)

Plot showing the volume requested by a revised OPN submitted at 07:48, together with what is permitted by the rule

Two hour notification disallows changes in these hours
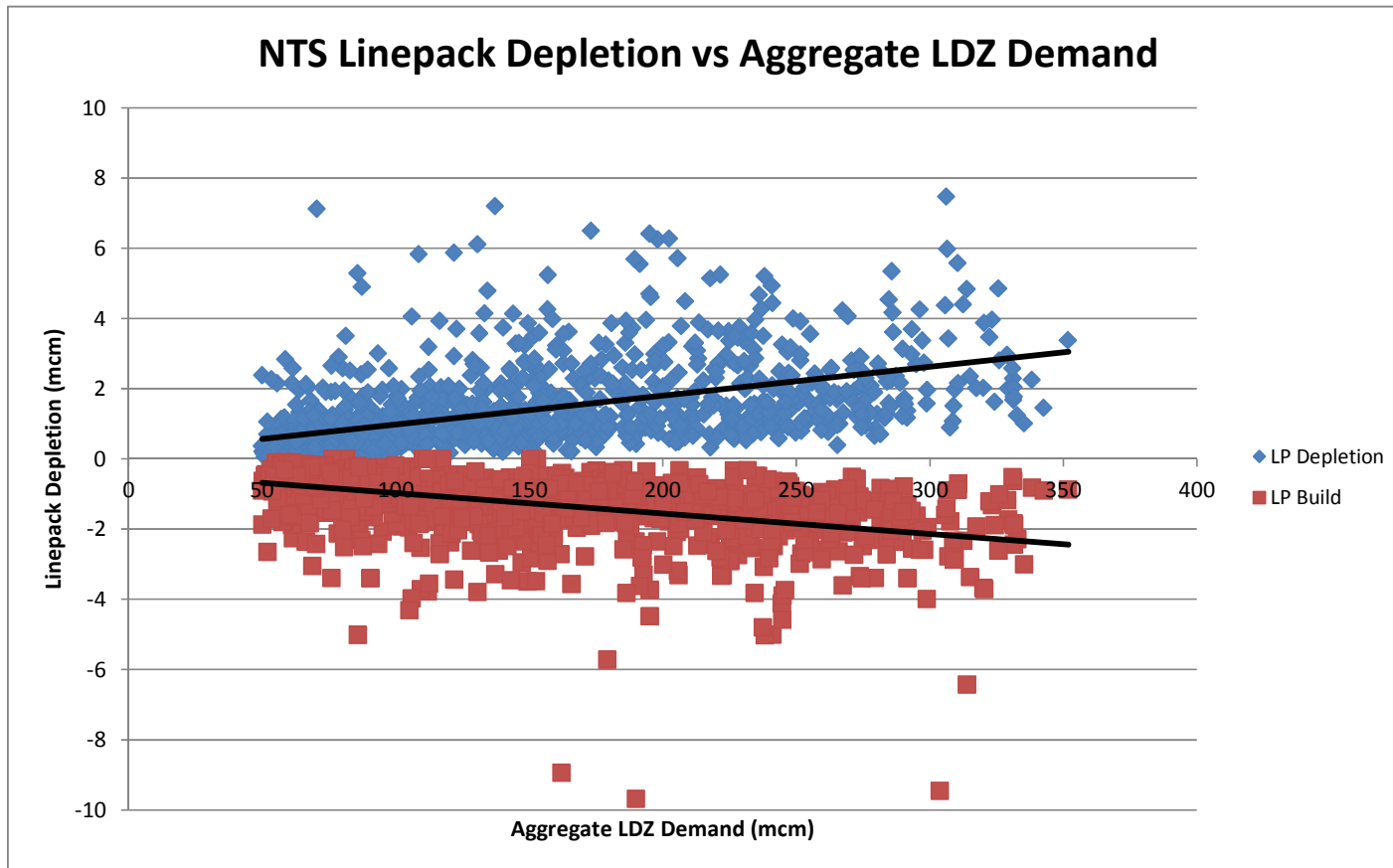
Hour revised OPN becomes effective

Legend:
- Max change permitted by rule
- Volume requested outside of rule
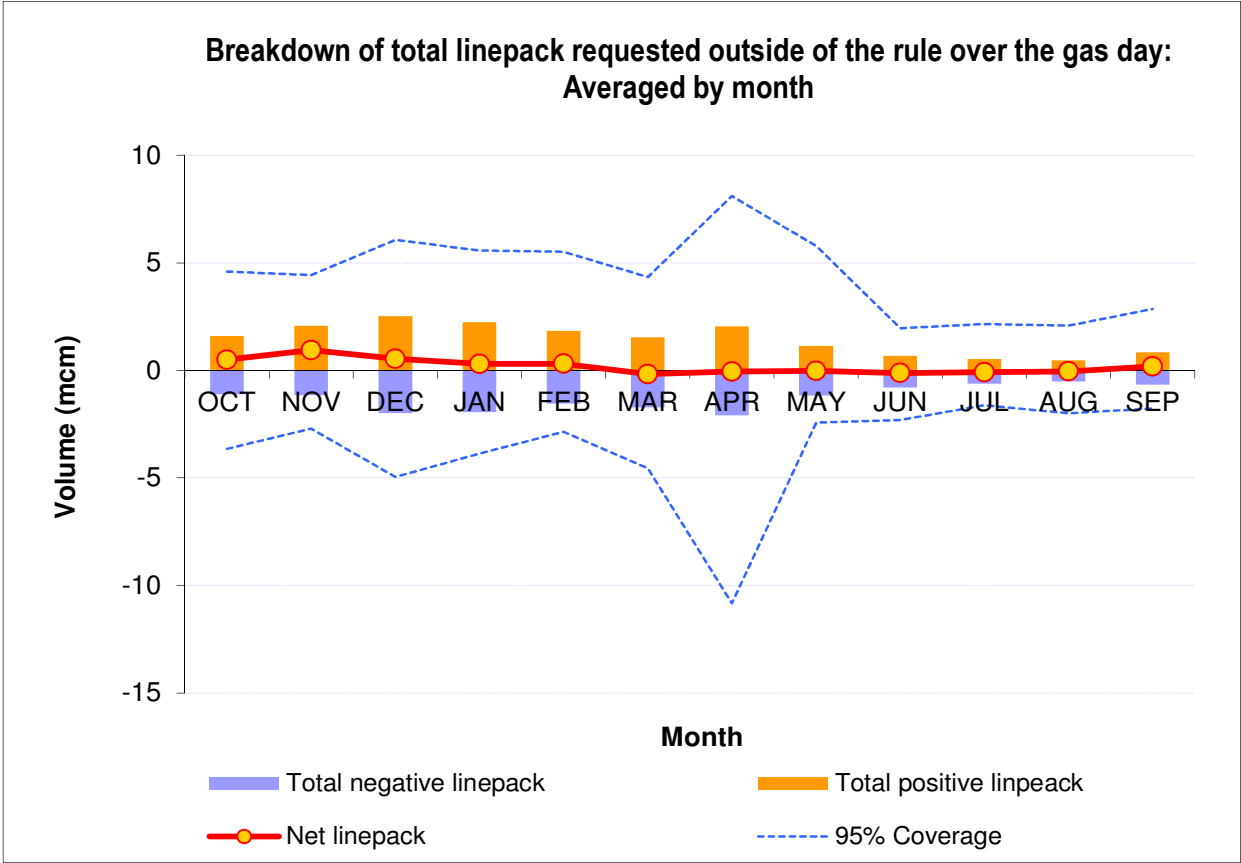- Volume requested within rule
- Prevailing OPN at 07:48

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NTS Linepack Depletion

NTS Linepack Depletion vs Aggregate LDZ Demand
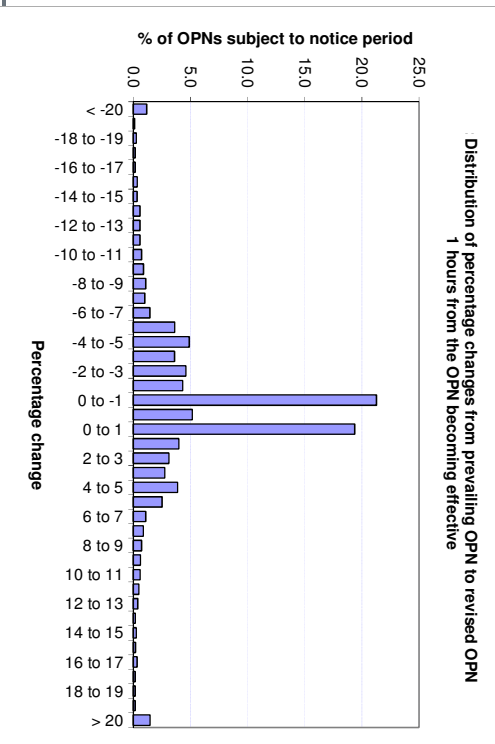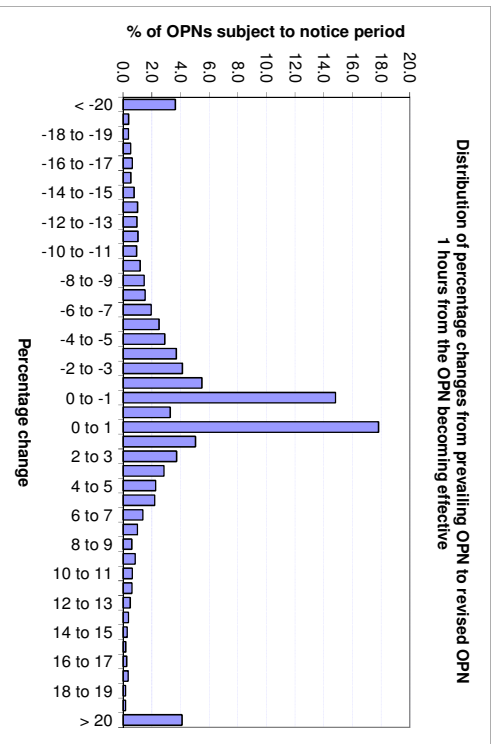
NTS Linepack Depletion

NTS Linepack Depletion vs Aggregate LDZ Demand

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NTS Linepack Depletion by Month
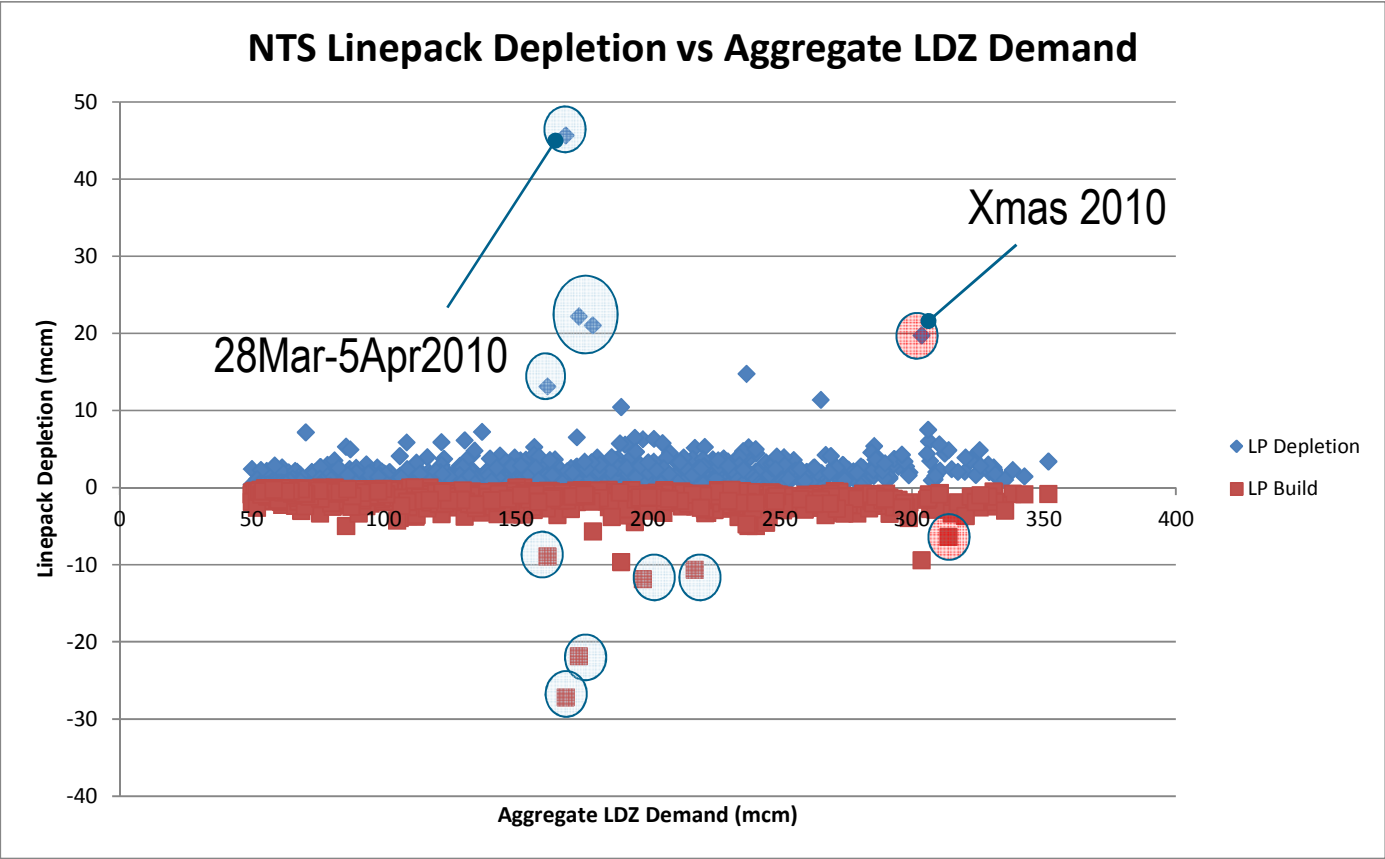
Breakdown of total linepack requested outside of the rule over the gas day: Averaged by month

Change from Prevailing OPN at Effective Hour

Distribution of percentage changes from prevailing OPN to revised OPN
0 hours from the OPN becoming effective

% of OPNs subject to notice period

Percentage change

Distribution of percentage changes from prevailing OPN to revised OPN
0 hours from the OPN becoming effective

% of OPNs subject to notice period

Percentage change

Distribution of percentage changes from prevailing OPN to revised OPN
0 hours from the OPN becoming effective

% of OPNs subject to notice period

Percentage change

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**Distribution of percentage changes from prevailing OPN to revised OPN
1 hours from the OPN becoming effective**

% of OPNs subject to notice period

Percentage change

**Distribution of percentage changes from prevailing OPN
1 hours from the OPN becoming effective**

% of OPNs subject to notice period

Percentage change

**Distribution of percentage changes from prevailing OPN to revised OPN
1 hours from the OPN becoming effective**

% of OPNs subject to notice period

Percentage change

**Distribution of percentage changes from prevailing OPN
1 hours from the OPN becoming effective**

% of OPNs subject to notice period

Percentage change

Change from Prevailing OPN at Effective Hour + 2

This distribution is representative of most (10) LDZs

Distribution of percentage changes from prevailing OPN to revised OPN
2 hours from the OPN becoming effective

Distribution of percentage changes from prevailing OPN to revised OPN
2 hours from the OPN becoming effective

Distribution of percentage changes from prevailing OPN to revised OPN
2 hours from the OPN becoming effective
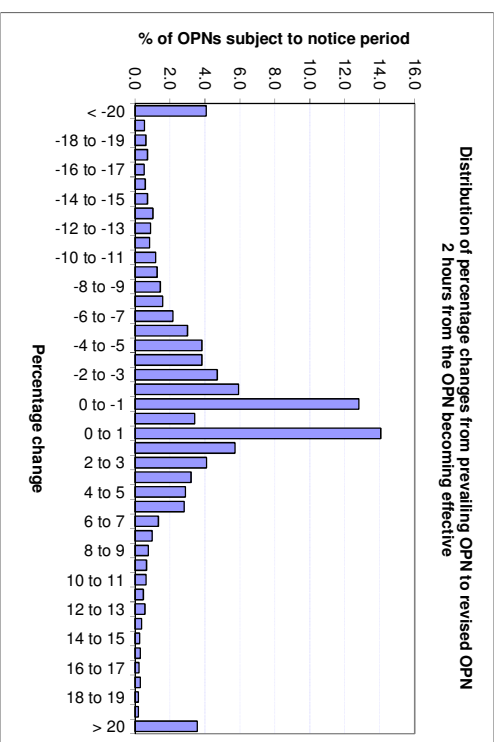
Summary of Current Performance vs Rule

- 2 hour notice period not adhered to
  - Is this a mis-interpretation of the rule?
- 2hr/5% rule often breached when no need in order to achieve EOD volume
- NTS is routinely providing capability over and above the 2hr/5% rule
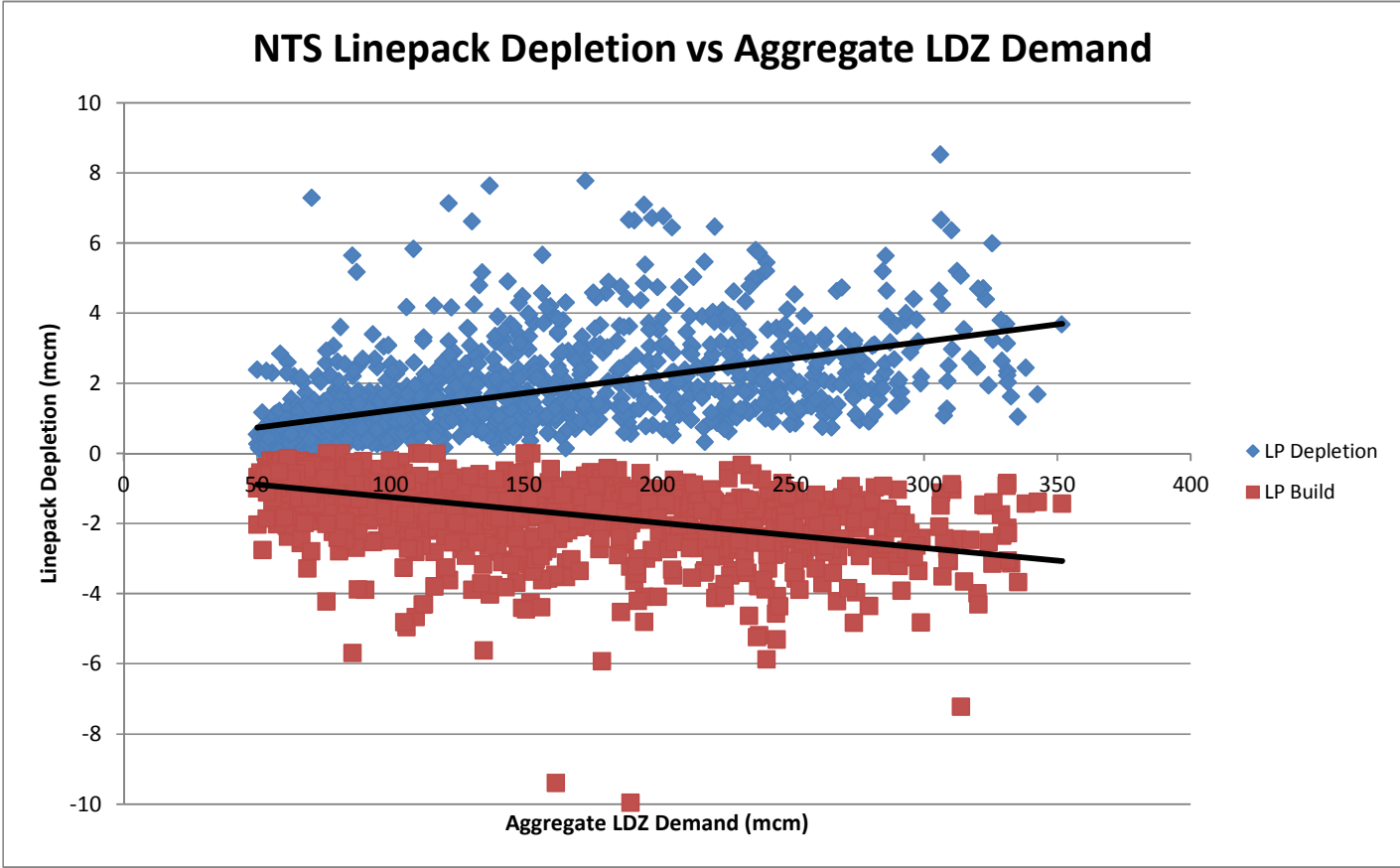- NTS linepack depletion effect ~ 6mcm for 95% coverage (Exc. April)

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Rule Removed

Generate Pseudo OPN

- Scaled Previous OPN
- Same "Remainder of Day" Volume

Use Max(NewOPN,PseudoOPN)

Assumed OPN with No Rule

Additional
NTS
Linepack
Depletion

D-1 OPN

09:56 D OPN

No Rule

Flow Rate (mcm/h) — vertical axis: 0.25, 0.30, 0.35, 0.40

Hour Bar — horizontal axis: 07:00, 09:00, 11:00, 13:00, 15:00, 17:00, 19:00, 21:00, 23:00, 01:00, 03:00, 05:00

Time of OPN Submission (09:56)
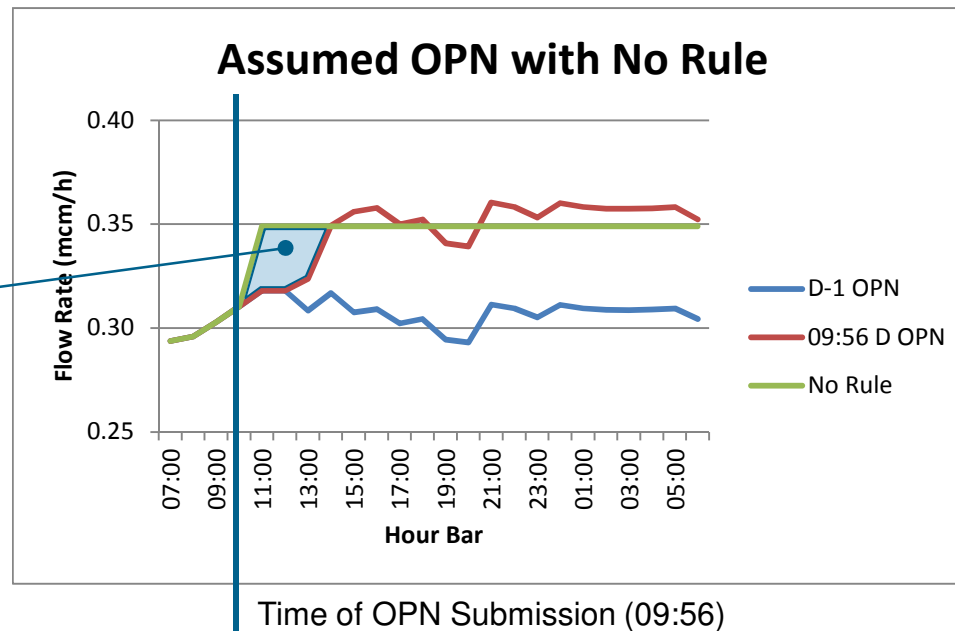
NTS Linepack Depletion – No Rule

Average NTS Linepack Depletion

With Rule

Breakdown of total linepack requested outside of the rule over the gas day:
Averaged by month

With No Rule

Breakdown of total linepack requested outside of the rule over the gas day:
Averaged by month

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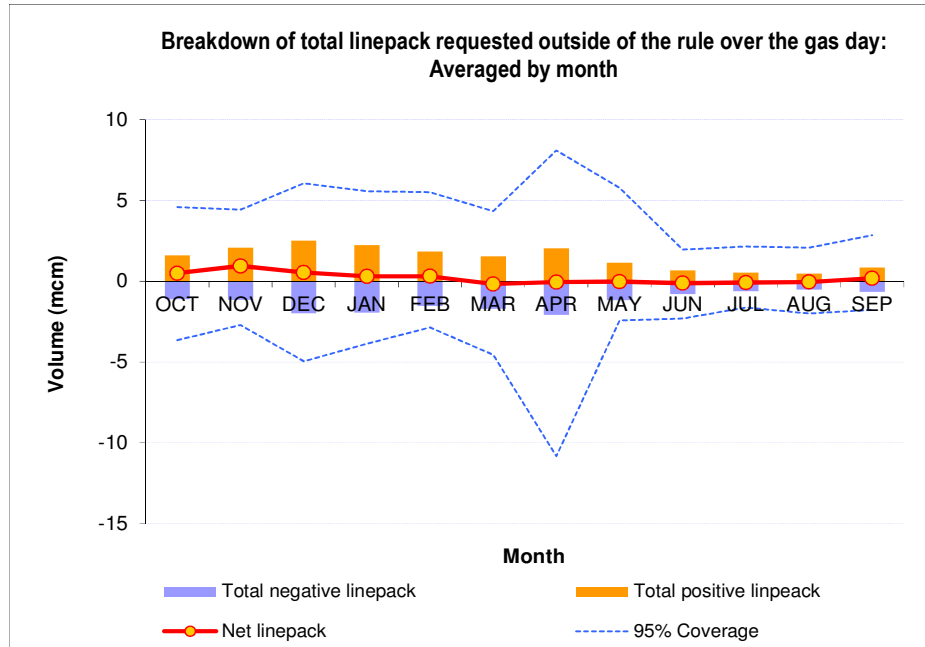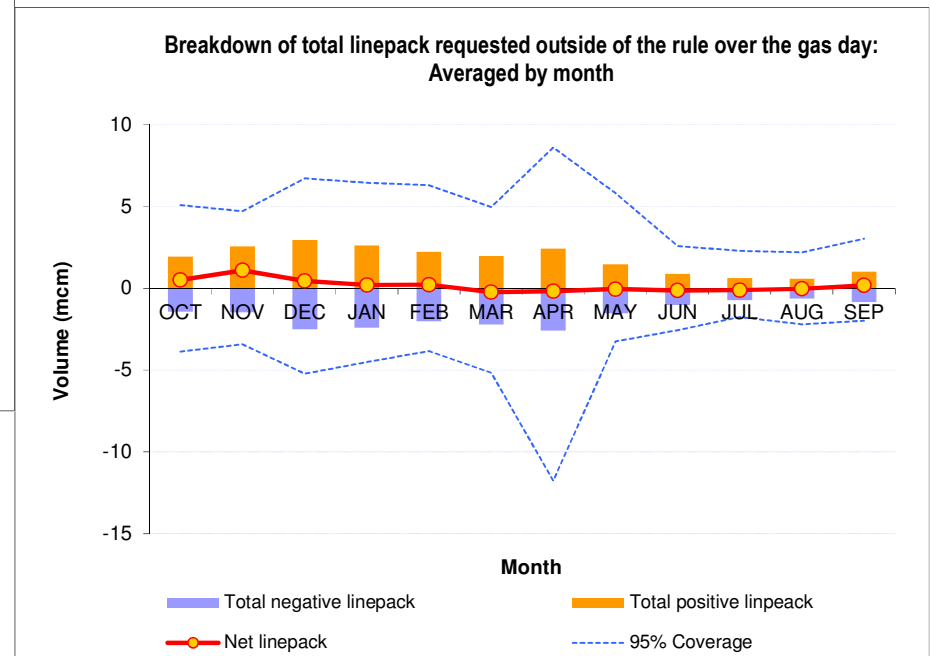
Summary of Rule Removal Analysis

Uncertainty about how behaviour may change if rule removed

Based on simple assumption of how OPN may change

- NTS linepack depletion effect ~ 7mcm for 95% coverage (Exc. April)

Retrospective OPN Changes

Prevailing OPN at 07:48

Retrospective OPN Changes

2 Hour Notice Period

FC_GAS_DAY	FC_TIME	D/D-1	GAS_DAY	LDZ	06-07	07-08	08-09	09-10	10-11	11-12	12-13
08/04/2009	00:56	D-1	09/04/2009		0.3850	0.3850	0.3850	0.3850	0.3850	0.3850	0.3850
09/04/2009	07:48	D	09/04/2009		0.4296	0.4261	0.4206	0.4189	0.4256	0.4260	0.4255

Revised OPN submitted at 07:48 (Notification Time)

OPN submitted in this hour

2 hour rule allows change here but not before.

Hour OPN becomes effective (Effective Hour)

Retrospective OPN Changes

New OPN Submitted at 12:52D

• Retrospective changes more closely reflect actual volumes
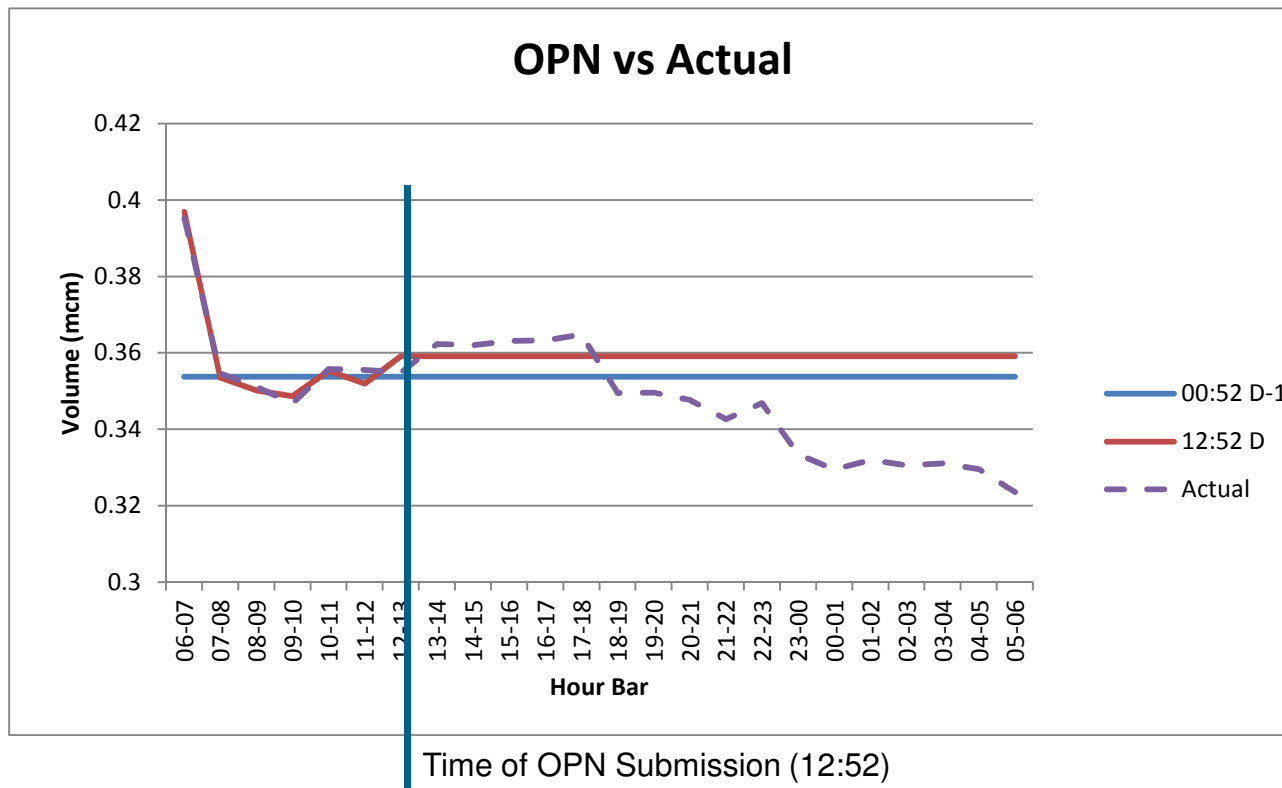
Retrospective OPN Changes

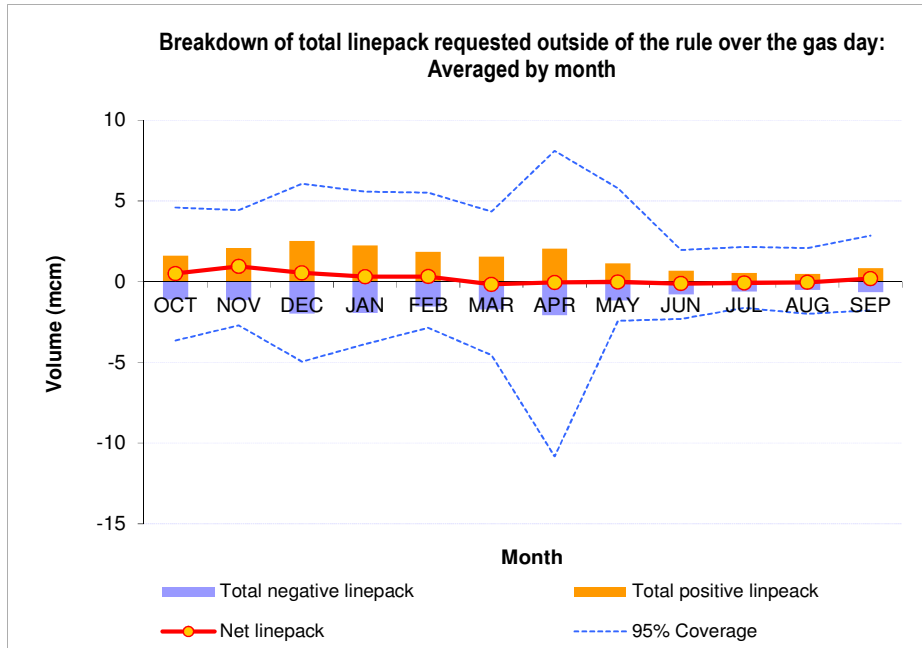How often are retrospective changes made?
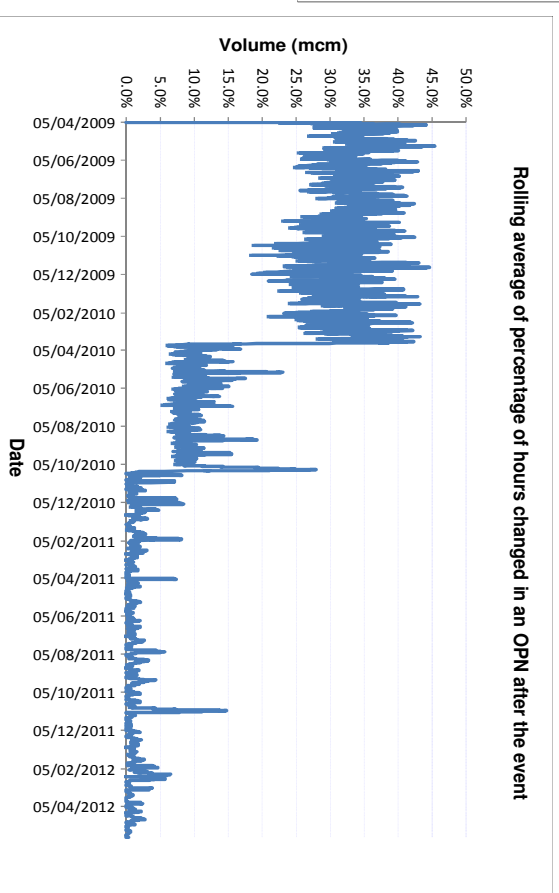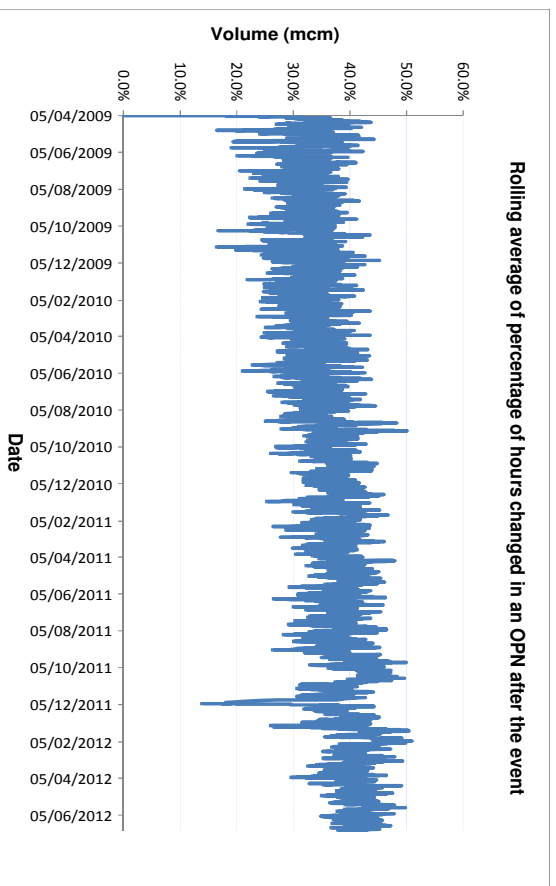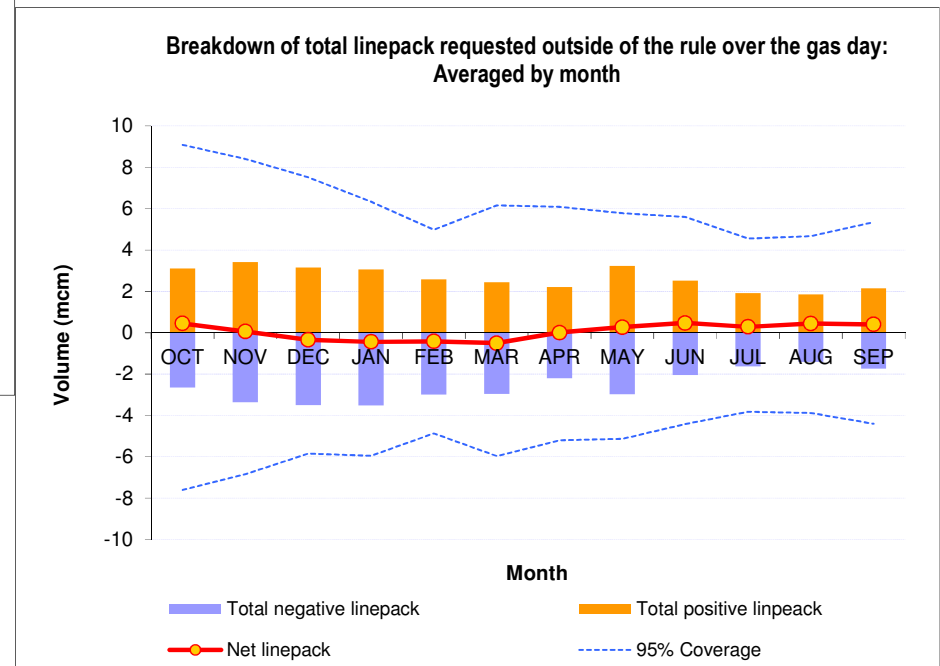
NTS Linepack Depletion – Retrospective Changes
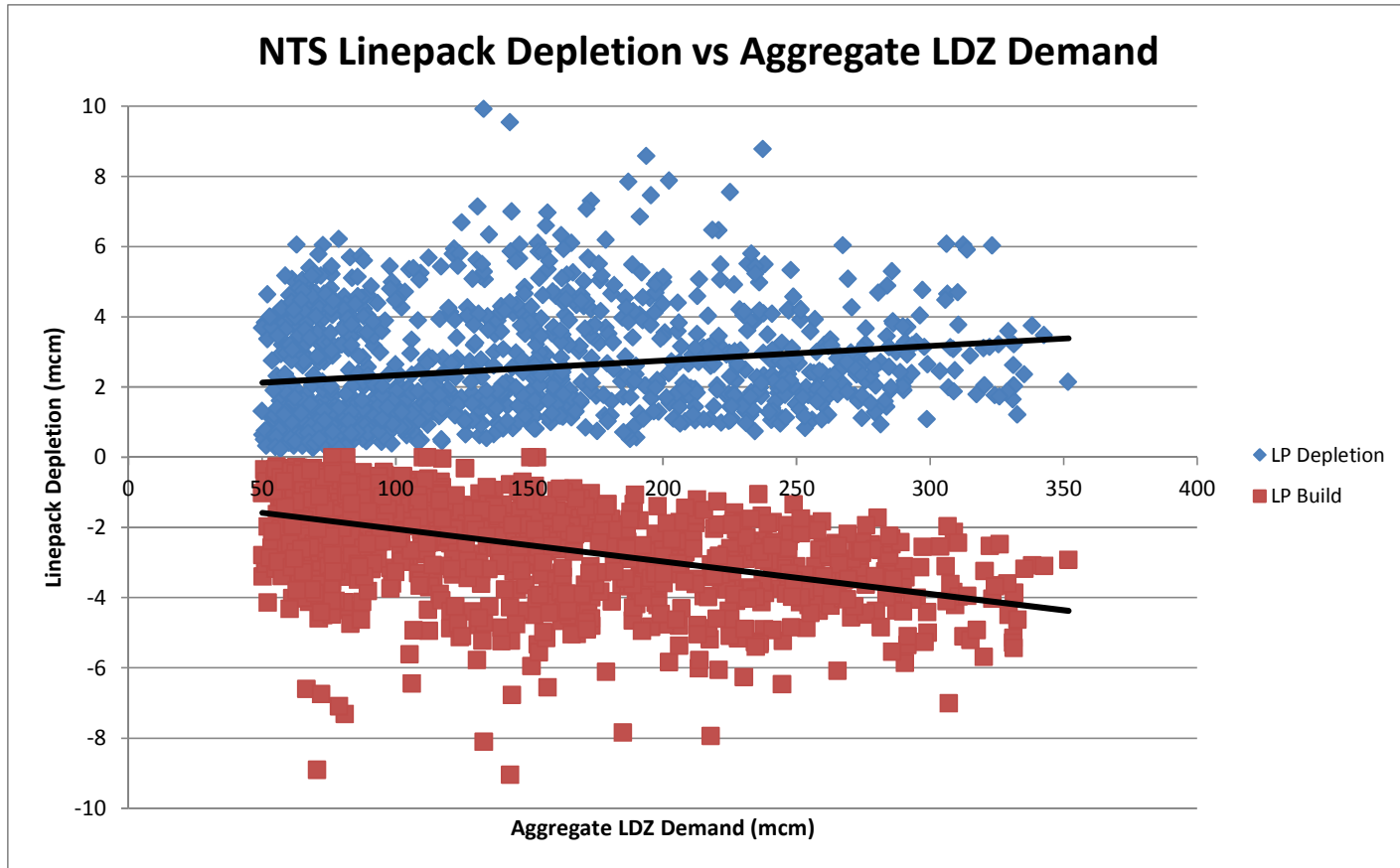
Avg NTS Linepack Depletion – Retrospective Changes

Future LP Depletion (after Effective Hour)

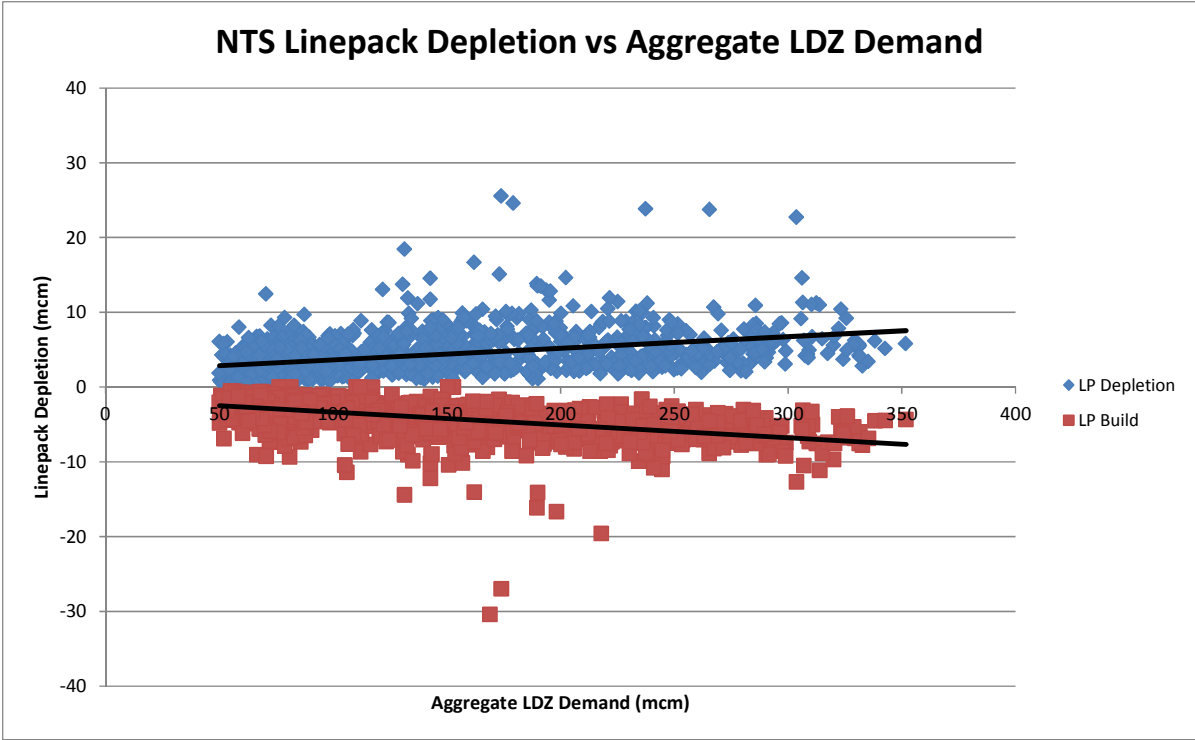## Retrospective LP Depletion (prior to Effective Hour)

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Summary of Retrospective Analysis

NTS linepack depletion due to retrospective OPN changes is greater than future changes
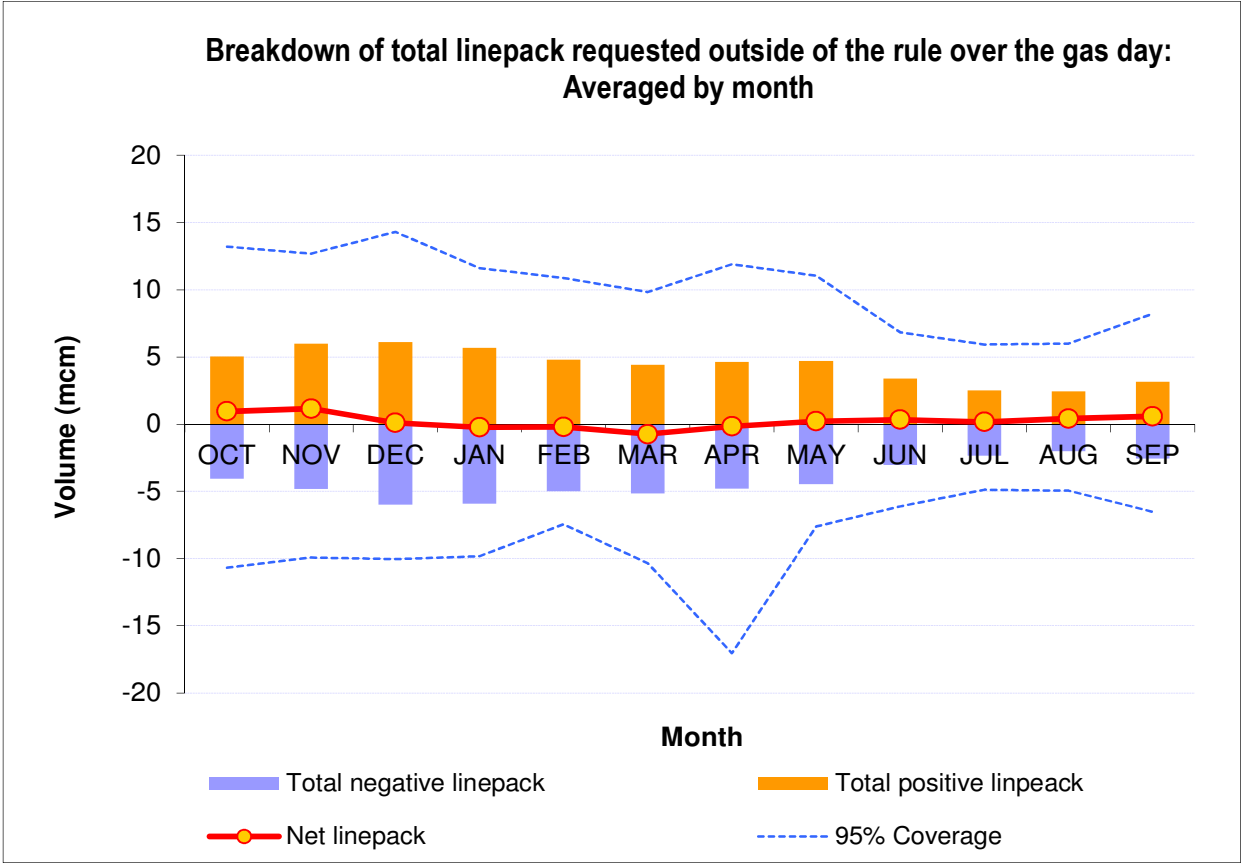
Additional NTS linepack depletion effect ~ 9mcm for 95% coverage

Combined NTS Linepack Depletion Effect

Combined effect of retrospective changes + rule removal

NTS Linepack Depletion by Month

Summary

Current Performance

- 2 hour notice period not adhered to
- NTS linepack depletion effect ~ 6mcm for 95% coverage (Exc. April)

Potential Impact of Rule Removal

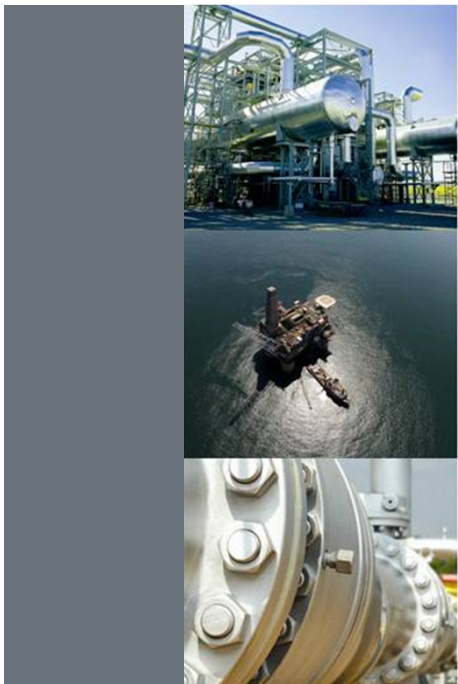- NTS linepack depletion effect ~ 7mcm for 95% coverage (Exc. April)

Current Impact of Retrospective OPN Changes

- NTS linepack depletion effect ~ 9mcm for 95% coverage

Combined Impact of Rule Removal and Retrospective OPN Changes

- NTS linepack depletion effect ~ 14-15mcm for 95% coverage

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Thankyou for your attention

Tony Perchard

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