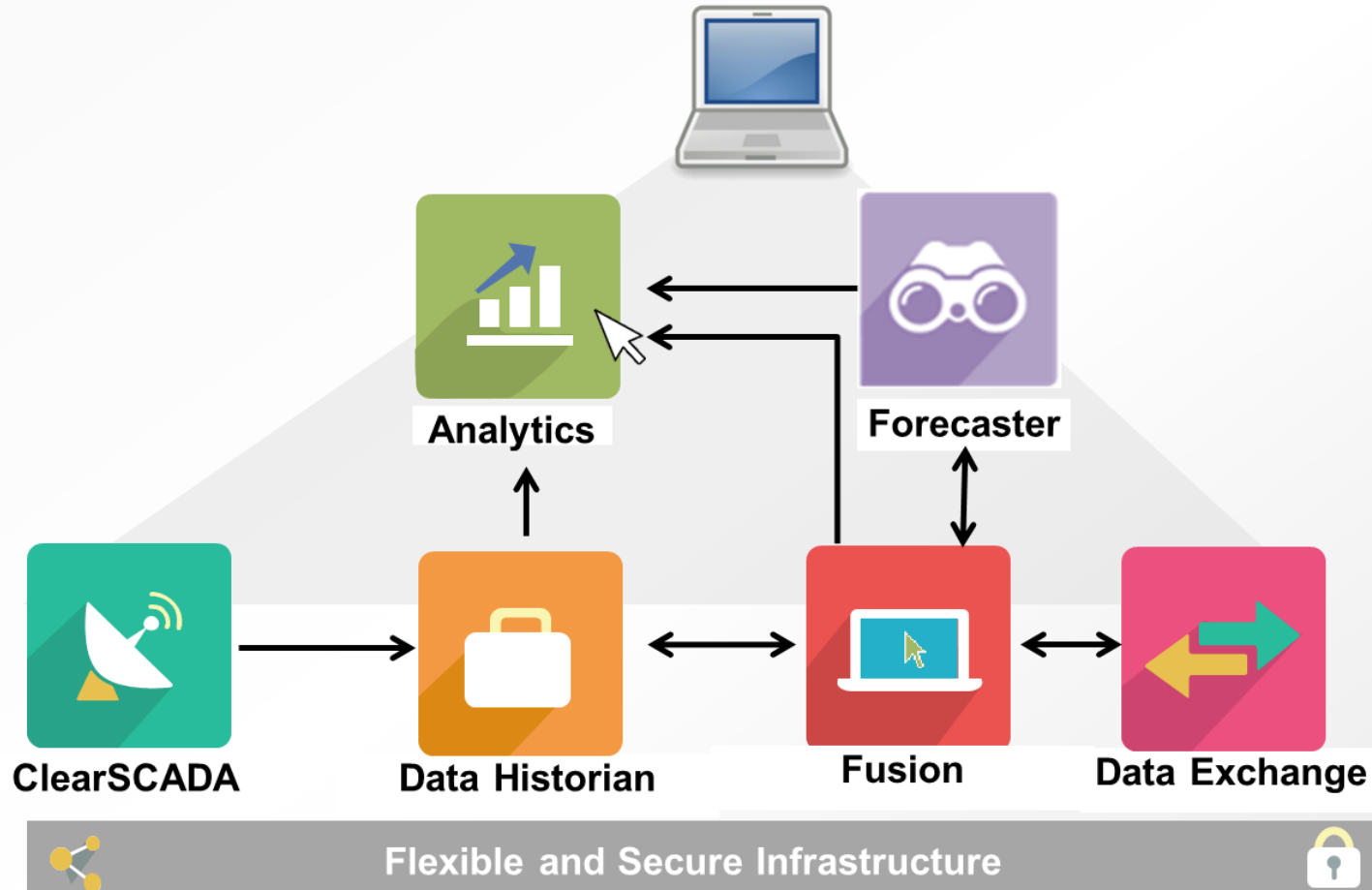


Implementation of the Gas Control Suite



Built upon flexible modular based architecture



Plans for Cutover to the Gas Control Suite

Must maintain safe visibility and control of the NTS at all times

Transfer 1 billion data items from old to new system

Reconnect sixty interfaces to twenty systems

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Minimal impact on external customers & stakeholders

Cutover experiences

GCS implementation issues impacting Gemini

- GCS implementation issues
- Principal impacts on shippers
- Initial actions to address issues
- Identified reconciliations and billing CV amendments
- Ongoing actions to address issues

GCS implementation issues

- Unable to complete normal after day processes to provide verified measurement and CV data to Gemini on 30 and 31 July during GCS cutover
- Measurement and CV data which had been verified as correct in Gemini for gas days 25 to 29 July before cutover was overwritten
- Some incorrect data items were passed to Gemini
- Unable to amend all items of incorrect data during Exit Closeout period during initial days of GCS operation

Principal impacts on shippers

- Incorrect allocation and demand attribution data remained in Gemini at Exit Closeout
- Some shippers received negative NDM allocations for Scotland and South East LDZs for gas days 27 and 28 July
- Some incorrect daily CV data, used for customer billing purposes, provided
- Incorrect allocations will have impacted some individual imbalance positions

Initial actions to address issues

- Worked closely with GCS project team and Gemini Application Support to identify and resolve key defects
- Introduced additional checks into after day processes
- Set up dedicated team to validate all data in GCS, Gemini and MIPI from 25 July
- Prompt reconciliation of high magnitude measurement errors affecting shipper NDM allocations on 27 July
- Measurement errors for LDZ offtakes were processed using the standard RbD process
- Worked closely with Xoserve to provide additional information to shippers to accompany July Commodity and Reconciliation invoices

Reconciliations identified - 25 July to 7 August

| Gas Day | NTS VLDMCs/ Industrials | NTS/LDZ Offtakes | LDZ VLDMCs/ Industrials | LDZ Bio- methane sites | Totals | Rec. Estimate (kWh) |
|----------|-------------------------------|---------------------|-------------------------------|------------------------------|--------|---------------------------|
| 25/07/16 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26/07/16 | 0 | 0 | 0 | 1 | 1 | 318,328 |
| 27/07/16 | 2 | 15 | 4 | 1 | 22 | 149,744,109 |
| 28/07/16 | 3 | 2 | 0 | 1 | 6 | 19,855,411 |
| 29/07/16 | 7 | 30 | 0 | 6 | 43 | 74,201,905 |
| 30/07/16 | 29 | 11 | 5 | 13 | 58 | 50,153,808 |
| 31/07/16 | 2 | 0 | 0 | 3 | 5 | 9,026,878 |
| 01/08/16 | 13 | 1 | 5 | 13 | 32 | 66,918,366 |
| 02/08/16 | 15 | 11 | 5 | 6 | 37 | 22,511,875 |
| 03/08/16 | 5 | 0 | 0 | 6 | 11 | 484,223 |
| 04/08/16 | 1 | 2 | 5 | 6 | 14 | 25,063,319 |
| 05/08/16 | 1 | 0 | 0 | 2 | 3 | 4,399,548 |
| 06/08/16 | 2 | 2 | 0 | 12 | 16 | 1,079,438 |
| 07/08/16 | 4 | 3 | 3 | 4 | 14 | 8,597,485 |

Billing CV amendments identified - 25 July to 7 August

| Gas Day | Billing CV Changes |
|----------|--------------------|
| 25/07/16 | 0 |
| 26/07/16 | 0 |
| 27/07/16 | 3 |
| 28/07/16 | 2 |
| 29/07/16 | 11 |
| 30/07/16 | 7 |
| 31/07/16 | 2 |
| 01/08/16 | 9 |
| 02/08/16 | 7 |
| 03/08/16 | 3 |
| 04/08/16 | 3 |
| 05/08/16 | 2 |
| 06/08/16 | 3 |
| 07/08/16 | 3 |

Processing of reconciliations

| NTS Inputs Points | NTS VLDMCs/ Industrials | NTS/LDZ Offtakes | LDZ VLDMCs/ Industrials | LDZ Bio-methane sites | Billing CV Changes |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------|
| No reconciliation (amendment up to M+15) | Correct measurements agreed with impacted shipper(s) | Reconciliation by Difference process | Reconciliations processed by Xoserve on behalf of Gas Distribution Networks | | Revised CVs notified directly to shippers, Xoserve and Ofgem |
| Reconciliation quantities notified to shippers via monthly Reconciliation and Energy Balancing invoices | | | | | |

- Reconciliations are expected to be processed over next 3 months
- Need to confirm correct measurements with shippers/operators

Ongoing actions to address issues

- Maintaining additional checks to ensure the best available data is published in Gemini within Exit Closeout
- Completing validation of all data in GCS, Gemini and MIPI from 25 July to at least 21 August
- Processing reconciliations of identified measurement errors using the standard processes
- Continuing to confirm calculations of billing CVs and notify shippers of any amended values using the standard procedures

Ongoing actions to address issues

- One potential impact identified is that shipper imbalances are cashed out at SMP whereas RbD reconciliation quantities are reconciled at SAP
- Some shippers may incur additional costs from the SMP/SAP difference, some shippers may benefit, with net cost passing to neutrality
- Individual shipper exposure will be further adjusted via neutrality redistribution of this net cost
- Currently working with Xoserve to investigate if we can identify which shippers have been impacted
- Please liaise with your normal contacts within National Grid or Xoserve to discuss any further concerns regarding reconciliation issues

MIPI Update



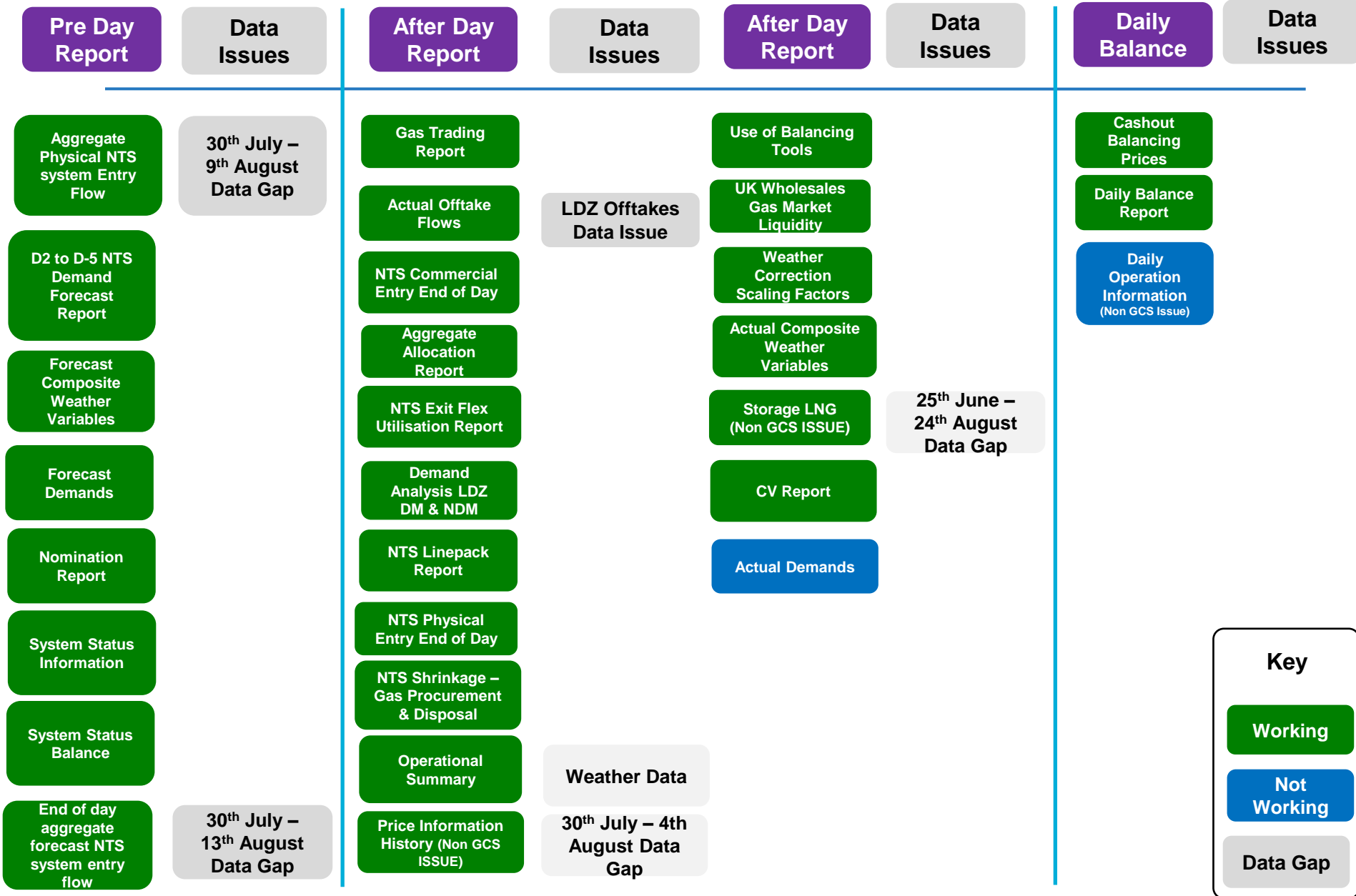
MIPI Data Update

Gas Operational Forum – Wednesday 21 September 2016

MIPI Update

- Leading up to and following GCS implementation there have been a number of data discrepancies on MIPI.
- A commitment was made to undertake work for this period (25th July- 5th August) by Friday 14th October.
- National Grid has been providing weekly updates on this work through the MIPI news item webpage.
- Data to be historically corrected
 - LDZ Offtakes at D+5
 - NTS Actual Demand

MIPI Energy – Daily Reports



Key

- Working
- Not Working
- Data Gap

Prevailing View Update

Prevailing View
Current Gas Day : Thursday, 15/09/2016 | [Help](#) | [Print](#)

[Previous](#)
Welcome to National Grid
[Next](#)

| System Status | Today | Tomorrow |
|---------------|------------|------------|
| | 15/09/2016 | 16/09/2016 |
| GDW | NONE | |
| MN Trigger | 455.00 | |

| Forecast | Graph |
|------------------------|-----------------------|
| Demand (mscm) | |
| Forecast Demand | 183.6 (06:06) |
| Seasonal Normal Demand | 176.0 172.0 |
| Supply (mscm/d) | |
| Forecast Flow | 192.2 (06:00) |
| Physical Flow | 203.2 (06:00) |
| Linepack (mscm) | |
| PCLP | 332.0 (06:06) |

[Long Term Demand](#)
[System Entry Point Flow Data](#)

Forecast Map
Actual Map

[Demand](#)
[Supply](#)
[Demand](#)
[Supply](#)

Forecast Annual Peak Demand 465 mscm

[Real Time Flow Data](#)

| ANS Messages |
|--------------|
| NONE |

| Actual | Graph | 13/09/2016 |
|----------------------------------------------|--------------------------------------------|-----------------------------------------------|
| Demand (mscm) | | |
| Actual Demand | | 200 |
| Seasonal Normal Demand | | 174 |
| Actual CWV | | |
| CWV Seasonal Normal | | 15 |
| Supply (mscm) | | |
| Beach including Norway | | 166 |
| LNG Imports | | 41 |
| Interconnectors | | 2 |
| Storage | | 6 |
| Linepack (mscm) | | |
| Opening | | 323.5 |
| EOD Export Physical Flows (mscm) | | |
| Bacton | | 57 |
| Moffat | | 12 |
| Storage Stock Levels (GWh) | | |
| | Graph | |
| | | 13/09/2016 14/09/2016 |
| Short | | 0 0 |
| Medium | | 13,698 13,760 |
| Long | | 13,715 13,715 |
| Actual Storage Stock (GWh) | | |
| | Graph | |
| Aggregate LNG Importation Stock (GWh) | | |
| | Graph | |
| | | 13/09/2016 14/09/2016 |
| | | 8,121 7,553 |
| Price | | |
| | Graph | 13/09/2016 |
| | | SAP SMP Buy SMP Sell 7 day Avg |
| p/kWh | 0.7574 0.7953 0.7195 0.8216 | |
| p/thm | 22.20 23.31 21.09 24.08 | |

GCS Communications

- Since go live with have ensuring the industry is kept updated with developments:
 - Shipper & DN teleconference;
 - Weekly MIPI updates on Gas Transmission Operational Newspaper;
 - ANS messages.
- Queries have been managed through Customer Liaison Team.
- Of the 78 queries raised since GCS implementation 70% are now closed with the remaining expected to be closed within the next 2 weeks.

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