



The Directors
National Grid Gas plc
National Grid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

22 August 2018

Dear Sir/Madam

UK Transmission System Management Principles Statement Auditor's report for the year ended 31 March 2018 ("the Year")

- 1 We have audited, in our role as UK Transmission System Management Principles Statement auditor, the extent to which National Grid Gas plc ("National Grid Gas"), in its procurement and use of system management and balancing services, has complied with the UK Transmission System Management Principles Statement ("Transmission SMPS") in the Year.
- 2 We have completed this audit work in accordance with the Form of Agreement, Project Proposal WS942194761 agreed between ourselves and National Grid Gas Plc on 11 December 2017.
- 3 Unless the context otherwise requires, words and expressions defined in the Transmission SMPS, which is a document prepared by National Grid Gas pursuant to Part C of Special Condition 8A of its Public Gas Transporter Licence, have the same meanings in this report as in that statement. All references to the Transmission SMPS refer to version 5.0, effective 1 April 2017.

Respective responsibilities of National Grid Gas and the UK Transmission System Management Principles Statement Auditor

- 4 National Grid Gas is responsible for taking all reasonable steps to ensure its compliance with the Transmission SMPS in respect of its use of system management services.
- 5 It is our responsibility, within our terms of reference, to review on a sample basis, the compliance of National Grid Gas with the Transmission SMPS in respect of the use of system management services. This work is performed with a view to expressing an independent opinion as to whether any non-compliances with the Transmission SMPS, which in aggregate we consider material, have come to our attention, which would make us believe that National Grid Gas has not complied with the Transmission SMPS in the use of system management services.
- 6 The scope and subject matter of our review is:
 - a. The identification of both National Requirements and Localised Requirements which may trigger the use of system management services; and
 - b. National Grid Gas' response to the identification of such a trigger, including any system management services that may have been deployed.

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Independence and Quality Control

- 7 We complied with the Institute of Chartered Accountants in England and Wales (ICAEW) Code of Ethics, which includes independence and other requirements founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.
- 8 We apply International Standard on Quality Control (UK&I) 1 and accordingly maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Basis of review and scope of work

- 9 We have performed the reasonable assurance engagement in line with the requirements of the International Standard on Assurance Engagement 3000 (Revised), 'Assurance engagements other than audits or reviews of historical financial information' issued by the International Auditing and Assurance Standards Board.
- 10 We have planned and performed our review in accordance with our review approach which we have agreed with National Grid Gas and which is set out in our document "UK Transmission System Management Principles Statement – Approach Document" ("the Supplement"), effective 6 August 2018. The Supplement sets out the objectives of our work and the nature of the opinion that we planned to issue for the Transmission SMPS review for the Year and has been sent to both National Grid Gas and the Office of Gas and Electricity Markets ("Ofgem").
- 11 The Supplement provides a detailed description of the approach we have adopted in the review. In particular, it describes those aspects of system management services that we have examined during our review and those which are outside the scope of this review. Our review included an examination, on a sample basis, of both the system management services procured and used by National Grid Gas, and of the estimates and judgements made by National Grid Gas in using system management services. This report should be read in conjunction with the Supplement.
- 12 In reaching our conclusion we assessed the risk of a material breach of the way National Grid Gas has used system management services compared with the requirements of the Transmission SMPS, whether caused by fraud or other irregularity or error, and considered the adequacy of procedures and controls established by National Grid Gas to eliminate or reduce such risks.

Opinion

- 13 Based on our procedures, in our opinion National Grid Gas has complied with the Transmission SMPS, in all material respects, during the year ended 31 March 2018, with regards to:
 - The identification of both National Requirements and Localised Requirements which may trigger the use of system management services; and
 - National Grid Gas' response to the identification of such a trigger, including any system management services that may have been deployed.

Use of this report

- 14 This report is intended solely for the use of the Directors of National Grid Gas and Ofgem. While we acknowledge that this report will be published on the National Grid Gas website, this is for information purposes only and we do not intend that it should be relied upon by anyone other than the parties mentioned above.



- 15 The maintenance and integrity of the National Grid Gas website is the responsibility of the directors of National Grid Gas. The work that we carried out does not involve consideration of these matters and, accordingly, we accept no responsibility for any changes that may have occurred to this report since it was initially presented on the website.
- 16 This report has been prepared in the expectation that National Grid Gas and Ofgem will have sufficient experience of system management services to understand the issues raised without further background explanation and to evaluate the contents of this report in the context of the scope of our work.

Yours faithfully,

PricewaterhouseCoopers LLP

PricewaterhouseCoopers LLP
Chartered Accountants
Birmingham

The UK Transmission System Management Principles Statement Review

Approach Document for
the year ending 31 March
2018

Final

6 August 2018

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Approach document

Background

1. The UK Transmission System Management Principles Statement ('Transmission SMPS') describes, at a high level, the basis on which National Grid Gas plc ('National Grid Gas') will employ system management services in the operation of the National Transmission System ('NTS') with respect to the national distribution of gas. The Transmission SMPS has been written to be consistent with National Grid Gas' licence obligation to operate the NTS in an efficient, economic and co-ordinated manner.
2. Part C of Special Condition 8A of National Grid's Gas Transporter Licence defines system management services as 'services in relation to the balancing of gas inputs and gas off takes from the NTS and includes balancing trades and balancing trade derivatives and constraint management services'.
3. The review will be conducted in accordance with International Standard on Assurance Engagements 3000 (Revised) 'Assurance engagements other than audits or reviews of historical financial information' ('ISAE 3000 (Revised)'), issued by the International Auditing and Assurance Standards Board.

Objective and scope of the System Management Principles Statement Review

4. The objective of our review is to form an independent opinion, based on our review work, as to the compliance of National Grid Gas, in all material respects, with the Transmission SMPS in respect of the use of system management services for the year ending 31 March 2018 ('the Review Year').
5. This Review Approach has been prepared by PricewaterhouseCoopers LLP and accepted by National Grid Gas as the basis for the current year's review, as required in the contractual arrangements in place between PricewaterhouseCoopers LLP and National Grid Gas in respect of this review.
6. The scope, and subject matter for the purposes of ISAE 3000 (Revised), of our review is:
 - a) The identification of both National Requirements and Localised Requirements which may trigger the use of system management services; and
 - b) National Grid Gas' response to the identification of such a trigger, including any system management services that may have been deployed.
7. National Grid Gas' approach to the identification of trigger points which may require the use of system management actions are set out in Part C of the Transmission SMPS.
8. The Transmission SMPS allows National Grid Gas discretion in the timing and nature of the system management services that may be used when a trigger point has been identified. The system management services available to National Grid Gas are described in Part D of the Transmission SMPS and Part C of the Procurement Guidelines. Part B.4 and Part E of the Transmission SMPS describes the principles to be applied by National Grid Gas in determining the timing of the use of system management services and in particular the use of system management services ahead of the gas day.
9. In agreement with National Grid Gas we have excluded from the scope of our review National Grid Gas' procedures which address the following activities described in the Transmission SMPS:
 - a) Emergency Procedures that National Grid Gas may invoke when, and as defined in, National Grid Gas' Emergency Procedure documentation described in Part B.6 of the Transmission SMPS;
 - b) The requirement to notify Users¹ of the impact of the deployment of system management services as required by Part B.5 of the Transmission SMPS;

¹ Persons other than National Grid who are contractually bound by the terms of the Network Code.

- c) Engineering decisions taken in the calculation of constraints on the NTS and the calculation of gas reserve holdings;
 - d) Engineering decisions made in the selection of the most appropriate system management service to deploy; and
 - e) The management and planning of NTS maintenance and other outages.
10. For the avoidance of doubt, it is not our responsibility to:
- a) Confirm that the Transmission SMPS is consistent with legislation/statutory obligations;
 - b) Perform a review or test of the accuracy, integrity or completeness of data received from third parties;
 - c) Assess the validity of data processing performed by National Grid Gas' operational and planning systems, specifically the Gas Control Suite (GCS) system (we will therefore rely upon the output from this system); or
 - d) Review the accuracy of forecast demand as prepared by National Grid Gas compared to actual demand.

Review approach

11. Our review work will be planned and undertaken to consider whether:
- National Grid Gas' procedures in respect of the identification of trigger points for the possible deployment of system management services are consistent with the requirements of Part C of the Transmission SMPS;
 - National Grid Gas has complied with its internal procedures in respect of the identification of trigger points;
 - National Grid Gas' procedures in respect of the deployment of system management services are consistent with the requirements of Parts D and E of the Transmission SMPS; and
 - National Grid Gas' action or inaction following the identification of a trigger point is reasonable in that such action:
 - Should reduce the potential gas demand/supply imbalance that has been identified;
 - Has not shown any undue bias towards any one particular shipper or provider of system management services; and
 - Has complied with National Grid Gas' internal operating procedures.
12. We will assess relevant internal operating procedures (review criteria) used by National Grid Gas for consistency with the Transmission SMPS. We will also review system management activities undertaken by National Grid Gas against these internal operating procedures to gain assurance that National Grid Gas has operated the NTS in accordance with the requirements of the Transmission SMPS.
13. It should be noted that instances of non-compliance with National Grid Gas' internal procedures will not automatically result in a non-compliance with the Transmission SMPS. In such circumstances we will discuss the procedural non-compliance with National Grid Gas' management and assess whether the procedural non-compliance has had any material financial effect on Users or indicates material bias towards or against any particular User.
14. We will design our testing to provide reasonable assurance that the identification of trigger points and the deployment of system management services during the Review Year have been carried out in accordance with the areas of the Transmission SMPS within the scope of our review.
15. In undertaking our review, we will assess the risk of a material non-compliance of the areas of the Transmission SMPS within the scope of our review. In areas where we have identified specific risks, or where weaknesses have been identified in the operation of specific internal controls, these compliance tests will be supplemented by substantive tests of detail of the relevant underlying data.

16. We will select a sample of gas days for testing in the Review Year. The selection of the particular days reviewed will be based solely on our assessment of risk. It will represent a mixture of ‘normal’ days and other days where we, or National Grid Gas’ Licence Assurance Audit Team, have identified unusual factors (e.g. system outages) or procedural non-compliances which, in our view, represent a risk as to compliance with internal operating procedures. Our sample of days for testing will also include days upon which either a Margins Notice or a Gas Deficit Warning has been issued and balancing actions have been taken.
17. We plan to sample a minimum of 48 gas days for testing. Should we identify any significant procedural non-compliances we plan to increase the extent of our testing.
18. Throughout our work, we will continue to monitor developments that impact upon the deployment of system management services and, where we identify a resulting risk in respect of our review, we will assess the risk and determine an appropriate response.

Materiality

19. We will plan and perform our review so as to be able to provide reasonable assurance that National Grid Gas has deployed system management services in all material respects in accordance with the Transmission SMPS.
20. The assessment of what is material, and therefore what issues, if any, warrant inclusion in the Transmission SMPS Report, is a matter of professional judgement. However, in applying this professional judgement, we will judge a failure on National Grid Gas’ part to comply with the Transmission SMPS as being material if, in our opinion, a reasonable professional person, considering National Grid Gas’ adherence to the Transmission SMPS in the round, would conclude that National Grid Gas had not complied with the Transmission SMPS if the matter was disclosed to them. In applying this judgement we will take into account the following factors:
 - a) The extent to which the actual outcome would have been different had the principles set out in the Transmission SMPS been applied;
 - b) The surrounding circumstances at the time(s) of any failure to comply with the Transmission SMPS;
 - c) The aggregate impact in the Review Year of any failure to comply with the Transmission SMPS;
 - d) The relative significance of the particular provision of the Transmission SMPS that has not been complied with; and
 - e) National Grid Gas’ definition of a Material and Non-material Breach as used internally to assess the significance of a non-compliance with procedures and used as the basis of reporting such matters at meetings with Shippers.

Reporting

21. We will issue a Transmission SMPS Report following the completion of our review work for the Review Year. The report will provide our opinion as to the extent to which National Grid Gas has complied, in all material respects, with the Transmission SMPS for the Review Year.

More detailed description of review work undertaken

22. The review work that we will carry out can be divided into the main areas shown below.

Input of Daily Flow Notifications (DFNs), Off-take Profile Notifications (OPNs) and Storage Flow Notifications (SFNs) notifications received from third parties

23. Input/conversion of data:

- Review adequacy of key internal procedures and management controls relating to the input of data provided by fax by third parties;
- Review, on a sample basis, evidence of compliance with procedures and controls in respect of the accuracy and timeliness of data input;
- Test, on a sample basis, accuracy and timeliness of conversion (where appropriate) and input of values notified by fax by third parties;
- Test, on a sample basis, accuracy and validity of manual adjustments made to values notified by faxes received from third parties; and
- Review audit findings identified by the National Grid Licence Assurance Audit Team in respect of input of fax data.

The identification of potential requirement to deploy system management services

24. For a national requirement to deploy system management services:

- Review adequacy of key internal procedures and management controls relating to the identification of a national requirement to deploy system management services and the consistency of these procedures with the Transmission SMPS; and
- Review, on a sample basis, evidence of compliance with procedures and controls in respect of the identification of a national requirement to deploy system management services.

25. For local requirement to deploy system management services:

- Review adequacy of key internal procedures and management controls relating to the identification of a local requirement to deploy system management services and the consistency of these procedures with the Transmission SMPS;
- Review, on a sample basis, evidence of compliance with procedures and controls in respect of the identification of a local requirement to deploy system management services; and
- Review, on a sample basis, gas pressure data to identify trigger points.

26. Incidents/exceptions:

- Review audit findings identified by the National Grid Licence Assurance Audit Team in respect of the identification of national and local trigger points; and
- Review, on a sample basis, operational logs/fault logs for IT systems to check for any system failures that may have resulted in delays in identifying national and local trigger points.

The deployment of system management services

27. The deployment of system management services:

- Review adequacy of key internal procedures and management controls relating to the deployment of system management services and the consistency of these procedures with the Transmission SMPS. Internal procedures to be considered will include the Balancing Hierarchies and Entry Capacity Strategy;
- Review, on a sample basis, evidence of compliance with procedures and controls in respect of the deployment of system management services;

- Review, on a sample basis, supporting documentation for each use of system management services to check consistency of supporting documentation with system records of actions taken; and
- Perform, on a sample basis, an overall review of system management services deployed to check for any potential bias towards or against a shipper or other provider of system management services.

28. Incidents/exceptions:

- Review audit findings identified by the Licence Assurance Audit Team in respect of the deployment of system management services; and
- Review, on a sample basis, operational logs/fault logs for IT systems to check for any system failures that may have resulted in delays/restrictions in National Grid Gas' ability to deploy system management services.

Maintenance of the integrity of data used in identifying requirements to deploy system management

29. A new operational system, Gas Control Suite (GCS), was implemented in July 2016 to replace iGMS. The scope of our review does not include the accuracy of processing undertaken by National Grid Gas' operational system GCS. However, our review does include controls over the integrity of data held by GCS and other systems used in the determination of trigger points and the deployment of system management services. Our review will therefore consider the adequacy of key controls over the following for these systems:

- Program development;
- Program changes;
- Computer Operations; and
- Access to programs and data.

Appendix

Appendix: Draft of our proposed review opinion.

The Directors
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Gallows Hill, Warwick
CV34 6DA

Dear Sir/Madam

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Yours faithfully,

PricewaterhouseCoopers LLP

Chartered Accountants

Birmingham



This document has been prepared only for National Grid plc and solely for the purpose and on the terms agreed with National Grid plc. We accept no liability (including for negligence) to anyone else in connection with this document, and it may not be provided to anyone else.

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