NETWORK OUTPUT MEASURES METHODOLOGY

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1.0 PURPOSE AND SCOPE

1.1 Methodology Purpose

1. This Network Output Measures Methodology Statement has been produced in accordance with standard Electricity Transmission Licence Condition B17, which is applicable to the three Transmission Licensees (Electricity) (National Grid, Scottish Power Transmission Limited (SPTL) and Scottish Hydro Electric Transmission Limited (SHETL)).

2. The Licence Condition requires the Transmission Licensees in GB to jointly develop a set of Network Output Measures in four areas:
    a. Network Asset Condition
    b. Network Risk
    c. Network Performance
    d. Network Capability

3. This Methodology Statement describes:
    a. The requirements in the Licence Condition
    b. The Transmission Licensees' collective understanding of the Licence Condition requirements
    c. The process the Transmission Licensees have followed in developing the Network Output Measures
    d. The common framework (concepts and principles) behind the Network Output Measures
    e. The proposed Network Output Measures
    f. Comparisons of the Network Output Measures with measures produced by other Asset Management organisations
    g. Further development requirements which the Transmission Licensees have identified

4. In addition to this Methodology Statement each Transmission Licensee will produce a Specific Appendix to describe specifically how each will produce the Network Output Measures using the common framework described in this Methodology Statement. These Specific Appendices will include the supporting data categories and models used to generate the Network Output Measures.

2.0 DEVELOPMENT PROCESS

2.1 Licence Requirements

5. Within this section the Transmission Licensees have considered part B of the Licence Condition:
    a. The Transmission Licensee shall, in consultation with other Licensees and interested parties, before 31 May 2008 or such later date as The Authority may direct, submit a methodology (the "Network Output Measures Methodology")

2.2 Development Process

6. The development process has included a number of internal and external meetings:
    a. Internal Transmission Licensee meetings
    b. Meetings with the Gas Transmission Licensee
    c. Meeting with the GB System Operator
    d. Cross Transmission Licensee meetings
    e. Meetings with The Authority
    f. Workshop with interested parties (including customers)

7. The Transmission Licensees have presented their proposals to The Authority throughout the development of the Network Output Measures to receive feedback.

8. Using the feedback from these meetings with The Authority, the Transmission Licensees have worked together to develop and agree a common framework (concepts and principles) for the Network Output Measures.

9. Consultation has also taken place with the Gas Transmission Licensee to ensure the Electricity Transmission Network Output Measures are, where practicable, consistent with those being developed for Gas Transmission.

10. Throughout the development of the Network Output Measures, discussions have taken place with the GB System Operator to both obtain information to feed into the development of the measures and gain their feedback on the approach being adopted as a customer of the Transmission Licensees.

11. A workshop was held on 8 May 2008 with interested parties to consult with them on the proposed Network Output Measures. Of the approximately 150 companies (customers and stakeholders) invited, 11 participants attended the workshop and feedback received has either been incorporated into the proposed Network Output Measures contained in this Methodology Statement or will feed into the further developments of the Network Output Measures. Material from the workshop can be accessed on the external National Grid's website. This can be found at the following link (http://www.nationalgrid.com/uk/Electricity/Info/TO_Initiatives).

3.0 USAGE OF NETWORK OUTPUT MEASURES

3.1 Licence Requirements

12. Within this section the Transmission Licensees have considered the following parts of the Licence Condition:
    a. The Network Output Measures shall be designed to facilitate:
        i. The monitoring of the Transmission Licensee's performance in relation to the development, maintenance and operation of an efficient, co-ordinated and economical system of Electricity Transmission
        ii. The assessment of historical and forecast network expenditure on the Licensee's Transmission System

13. Other parts of Licence Condition Part B: Paragraph 4 are addressed in other sections within this document.

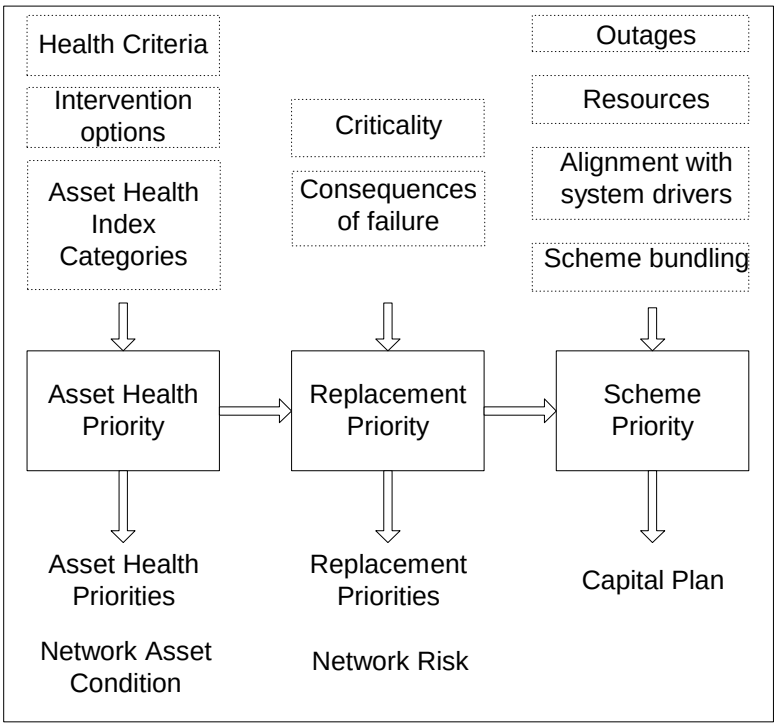
3.2 Using the Network Output Measures

14. The Transmission Licensees are committed to developing Network Output Measures that can be used internally to enhance current Asset Management processes and understanding of business drivers. This is especially in relation to the development, maintenance and operation of our networks and in assessing future network expenditure. The Transmission Licensees have included in their Specific Appendices a description of how they are using the Network Output Measures internally.

15. In developing the Network Output Measures, the Transmission Licensees have also incorporated information from The Authority on how The Authority intends to use the Network Output Measures during this present Transmission Price Control Period and for future Price Control Reviews.

16. Figure 1 shows how elements of the Network Output Measures feed into a capital plan. Health criteria (e.g. Condition, Performance) categorised into Asset Health Indices are used with knowledge of previous interventions (e.g. Refurbishment) to determine Asset Health Priorities. These Asset Health Priorities are combined with information about criticality to determine Replacement Priorities. These Replacement Priorities are combined with other factors (e.g. Outages, Resources) to determine scheme priority which feeds into the Capital Plan.

Figure 1: Understanding Network Expenditure Requirements



17. Figure 1 shows how Asset Health Priorities feed into Replacement Priorities and the Capital Plan. Asset Health Priorities also feed into other intervention activities (e.g. Maintenance, Refurbishment, Repair) or a decision to defer intervention activities.

4.0 REPORTING TO THE AUTHORITY

4.1 Licence Requirements

18. Within this section the Transmission Licensees have considered the following parts of the Licence Condition:
    a. The Transmission Licensee shall in consultation with other Transmission Licensees and interested parties, before 31 May 2008 submit a methodology for approval by The Authority:
        i. The Transmission Licensees will submit an annual report on the Network Output Measures to The Authority by 31 July of every subsequent year once the methodology has been agreed
    b. Once the Network Output Measure Methodology has been approved by The Authority the Transmission Licensee shall:
        i. From 1 April 2009, or such later date as The Authority may direct, record the data required for the application of the Network Output Measures Methodology together with the Network Output Measures derived pursuant to it
        ii. Provide historical data, where reasonably practicable, for a period of the last 10 years from the submission of the methodology

4.2 Reporting Timescales

19. Once the Network Output Measures Methodology has been agreed with The Authority, the recording of the Network Output Measures will begin on 1 April 2009 and the first annual report will be submitted to The Authority by 31 July 2010.

20. The Transmission Licensees will include information on the availability of historical data in the individual Specific Appendices.

21. The Transmission Licensees propose that:
    a. Network Output Measures are incorporated into the Transmission Regulatory Reporting Packs because the Network Output Measures will be reported in July each year coincident with Transmission Regulatory Reporting Packs submission
    b. Information provided in these consolidated Transmission Regulatory Reporting Packs is rationalised to avoid overlaps and duplication and is made consistent with other reporting to The Authority (e.g. GB Transmission System Performance report)

5.0 METHODOLOGY

5.1 Network Asset Condition

5.1.1 Licence Requirements

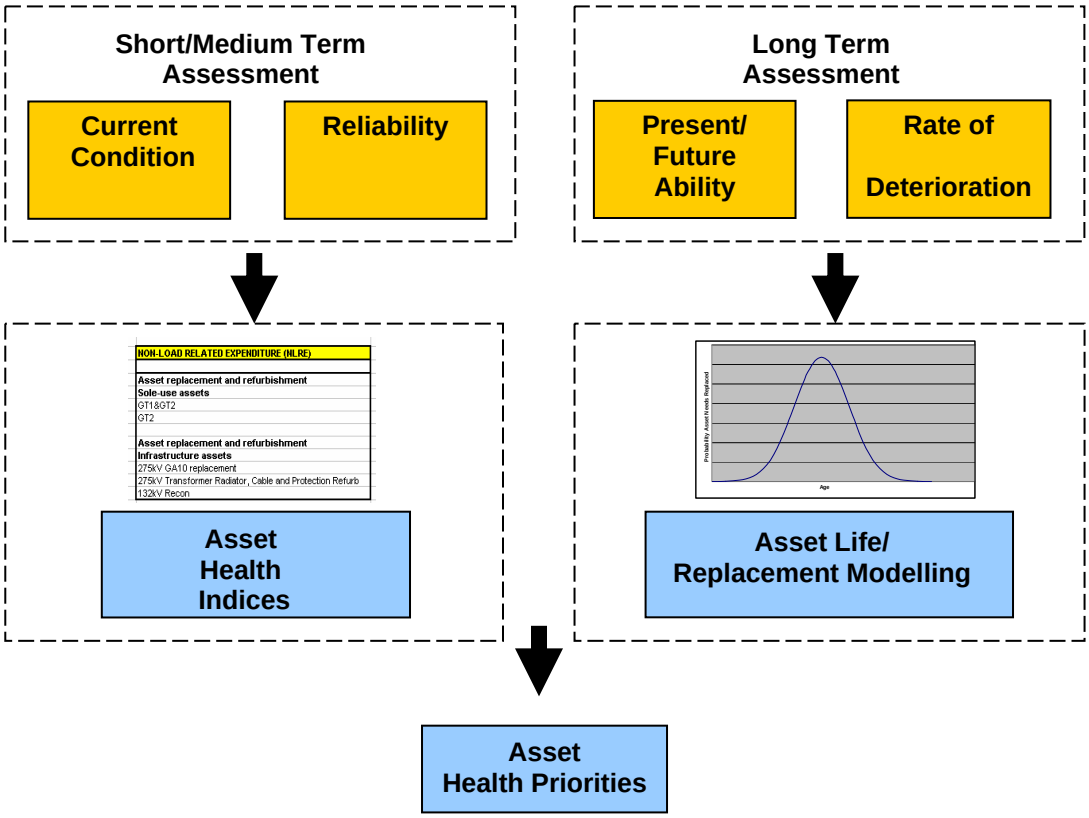
22. Paragraph 2(a) of the Licence Condition requires the Transmission Licensees to enable the evaluation of:
    a. The current condition of the assets which collectively form the Licensee's Transmission System (including the condition of the principal components of those assets) (collectively, 'network assets'), the reliability of network assets, and the predicted rate of deterioration in the condition of network assets which is relevant to making assessment of the present and future ability of network assets to perform their function ('network asset condition')

23. The key elements from this Licence Condition are:
    a. Current condition of the assets
    b. Reliability of network assets
    c. Predicted rate of deterioration in condition
    d. Present/future ability of network assets to perform their function

5.1.2 Methodology

24. The Licence Condition requirement can be summarised as the need to enable the evaluation of Asset Health Prioritisation of the Transmission Licensee's assets. Figure 1 describes how Asset Health Prioritisation feeds into the assessment of the capital plan. Figure 2 presents how the key elements of asset condition combine to determine the number and category of assets to be replaced within specific timescales (i.e. Asset Health Priorities). Each section of the diagram is described in the proceeding paragraphs.

Figure 2: The development of the Asset Health Priorities from short, medium and long term assessment



25. This assessment approach to determine the Asset Health Priorities can be described in two separate timescales:
    a. Short and medium term assessment
    b. Long term assessment

5.1.3 Short and Medium Term Assessment

26. Asset condition is the main factor in determining asset health and correspondingly remaining useful life of the asset. Asset Health Indices are categorised as follows:
    a. Remaining Useful Life 0-2 Years
    b. Remaining Useful Life 2-5 Years
    c. Remaining Useful Life 5-10 Years
    d. Remaining Useful Life >10 Years

27. Asset Health Priorities are based on a number of objective factors, examples of which are noted in Table 1.

Table 1: Example Factors used to determine Asset Health Indices

No	Factor	Measure
1.	External Condition	Photographic comparison by graded comparators
2.	Fault Rate	Using national fault database – collated view of faults
3.	Internal Condition	Dissolved Gas Analysis (BS EN 60567)
4.	Issues Arising	Specific to asset types – ENA NEDeRs, Operational Restrictions

28. Asset performance information (e.g. fault rate, failure information) is factored into the Asset Health Priorities that provides a measure of the reliability of network assets.

29. Asset Health Priorities will be produced for the four main equipment groups:
    a. Circuit Breakers
    b. Transformers
    c. Overhead Line Conductors
    d. Underground Cables

5.1.4 Long term Assessment

30. The long term assessment is based on asset life/replacement profiles. This allows the review of historical/forecast capital expenditure and is an established process used by The Authority and the Transmission Licensees for all four Transmission Price Control Reviews.

31. The study of asset life profiles in the long term assists the assessment of deterioration in condition and implicitly indicates the present/future ability of network assets to perform their function.

5.1.5 Reporting

32. The above short, medium and long term assessment results in the delivery of Asset Health Priorities which measures the overall condition of assets.

33. In using the 'remaining useful life' categorisation as reported by the Distribution Network Operators (DNOs) within their annual Regulatory Reporting Packs, Transmission reporting for Network Asset Condition can be compared with the equivalent DNOs reporting. The proposed Asset Health Priorities are summarised and included within the Transmission Regulatory Reporting Pack as shown in Figure 3.

Figure 3: Proposed Network Asset Condition Regulatory Report Table

Asset Categories		Units	Asset Distribution Based on Estimated Remaining Useful Life				Asset Register	TO Comments
TO Categories			Remaining Useful Life				31-Mar	
			0-2 Yrs	2-5 Yrs	5-10 Yrs	>10 Yrs		
400KV Network								
1	Circuit Breaker	No CB					0	
2	Transformer	No TX					0	
3	Overhead Line	Km					0	
4	Underground Cable	Km					0	
275KV Network								
1	Circuit Breaker	No CB					0	
2	Transformer	No TX					0	
3	Overhead Line	Km					0	
4	Underground Cable	Km					0	
132KV Network								
1	Circuit Breaker	No CB					0	
2	Transformer	No TX					0	
3	Overhead Line	km					0	
4	Underground Cable	km					0	

5.1.6 Development Work Required

34. There is no additional development work proposed for Network Asset Condition. As part of continuous improvement, the Transmission Licensees will develop their understanding of the condition of their transmission assets and consequently further enhancements will be made to the Asset Health Priorities. These enhancements will be reflected in the Transmission Licensees Specific Appendices.

5.1.7 Additional Material Included within Transmission Licensees' Specific Appendices

35. Each Transmission Licensee will cover how Network Asset Condition will be implemented within their Specific Appendix.

[redacted]

5.2 Network Risk

5.2.1 Licence Requirement

37. Paragraph 2(b) of the Licence Condition requires the Transmission Licensees to enable the evaluation of:
    a. The overall level of risk to the reliability of the Licensee's transmission system as a result of Network Asset Condition and the interdependence between network assets ('network risk')

38. The key elements from this Licence Condition are:
    a. Overall level of risk
    b. Inclusion of Network Asset Condition
    c. Interdependence between network assets

39. The Transmission Licensees have carefully considered this Licence Condition and in the development of the proposed measures have used the following definition for Network Risk:

    "The likelihood and consequence of a potential negative impact to the network, as a result of a future event."

5.2.2 Methodology

40. To enable the evaluation of Network Risk the Transmission Licensees will include information used in the development of an optimised replacement plan.

41. To facilitate the development of an optimised replacement plan, prioritised candidates for asset replacement will be produced for the four main equipment groups:
    a. Circuit Breakers
    b. Transformers
    c. Overhead Line Conductors
    d. Underground Cables

42. Development of Replacement Priorities will provide the prioritised candidates for asset replacement. Figure 1 shows how Replacement Priorities feed into the development of the capital plan.

43. Replacement Priorities are determined through three activities:
    a. Assessment of Asset Health Priorities – Already defined as part of Network Asset Condition
    b. Assessment of Criticality
    c. Derivation of Replacement Priorities

44. Replacement Priorities are categorised by:
    a. Replace within 0-2 Years
    b. Replace within 2-5 Years
    c. Replace within 5-10 Years
    d. Replace after 10 Years

45. Criticality has three elements:
    a. System Criticality
    b. Safety Criticality
    c. Environmental Criticality

46. System Criticality covers the impact of the transmission system not delivering services to customers and can be defined at both a circuit and a substation level.

[redacted]

[redacted]

47. A common approach to the assessment of System Criticality is yet to be developed. The factors which are to be included within the assessment of System Criticality are also yet to be finalised. It is proposed that System Criticality will be scored using a consistent scale (i.e. High, Medium, and Low).

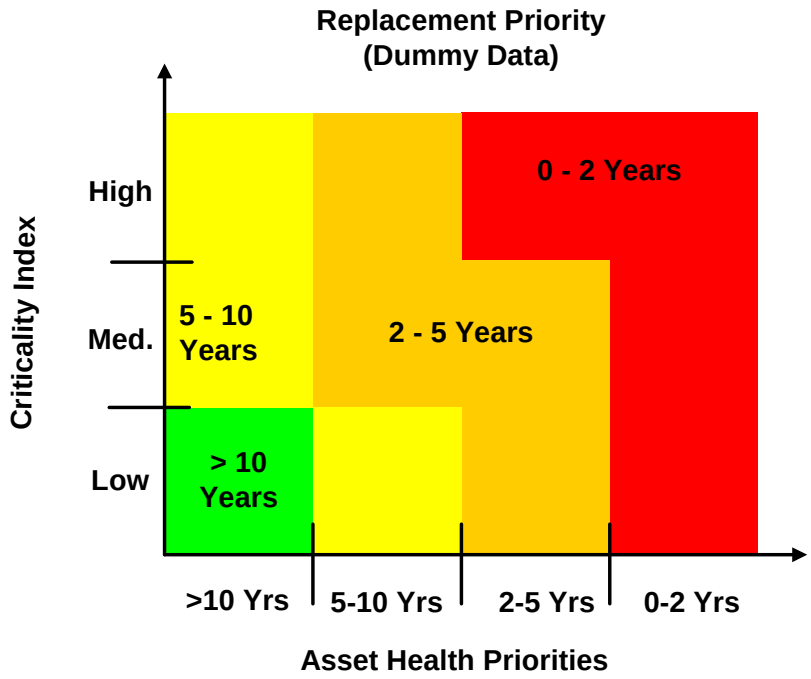
48. Safety Criticality covers the risk of direct harm as a result of asset failure (e.g conductor drop, fire or explosion).

49. Environmental Criticality covers the environmental impact caused by events such as cable oil leakage taking into account the sensitivity of the environment local to the asset.

50. Safety and Environmental Criticality needs to be assessed on an individual asset basis as the safety or environmental impact of asset unreliability will depend on the asset type and location. For this reason whilst Safety Criticality and Environmental Criticality will be categorised using a consistent scale (i.e. High, Medium, and Low), the assessment of Safety and Environmental Criticality will be documented separately for each Transmission Licensee in the Specific Appendices.

51. Figure 4 shows a potential representation of how Asset Health Priorities and Criticality may be mapped to obtain a Replacement Priority.

Figure 4: Potential Mapping of Replacement Priorities



52. Further work is required to develop a common approach to assessing System Criticality, to developing a common scale to allow comparability of System, Safety and Environmental Criticality and developing a common mapping to determine Replacement Priorities. Any of the work undertaken by the Transmission Licensees in developing this thinking will be included in the Specific Appendices.

5.2.3 Reporting

53. The proposed Replacement Priorities are summarised and included within the Transmission Regulatory Reporting Pack as shown in Figure 5.

Figure 5: Proposed Network Risk Regulatory Reporting Table

Asset Categories		Units	Replacement Priorities				Asset Register	TO Comments
TO Categories			Replace Within				31-Mar	
			0-2 Yrs	2-5 Yrs	5-10 Yrs	>10 Yrs		
400KV Network								
1	Circuit Breaker	No CB					0	
2	Transformer	No TX					0	
3	Overhead Line	Km					0	
4	Underground Cable	Km					0	
275KV Network								
1	Circuit Breaker	No CB					0	
2	Transformer	No TX					0	
3	Overhead Line	Km					0	
4	Underground Cable	Km					0	
132KV Network								
1	Circuit Breaker	No CB					0	
2	Transformer	No TX					0	
3	Overhead Line	km					0	
4	Underground Cable	km					0	

5.2.4 Development Work Required

54. Further development work is required in three areas:
    a. The definition of System Criticality
    b. The development of a common comparable scale for System, Safety and Environment Criticality
    c. The definition of Replacement Priority

55. The work required to develop a common approach to assessing System Criticality, common scale to allow comparability of System, Safety and Environmental Criticality and a common mapping to determine Replacement Priorities will be delivered during autumn 2008.

5.2.5 Additional Material Included within Transmission Licensees' Specific Appendices

56. Each Transmission Licensee will cover how Network Risk will be implemented within their Specific Appendix.

5.3 Network Performance

5.3.1 Licence Requirement

58. Paragraph 2(c) of the Licence Condition requires the Transmission Licensees to enable the evaluation of:
    a. Those aspects of the technical performance of the Licensee's transmission system which have a direct impact on the reliability and cost of services provided by the Transmission Licensee as part of its transmission business ('network performance')

59. The key elements from this Licence Condition are:
    a. Performance of the Licensees' transmission system
    b. Direct Impact on the reliability and cost of the services

5.3.2 Methodology

60. Network Performance is a key output for the customer of the Transmission Licensees.

61. To provide a full picture on Network Performance it is necessary to consider a number of complementary performances measures. This is because some measures consider events only and some consider a combination of event and duration. The Transmission Licensees already report a comprehensive set of Network Performance measures in the form of unavailability, faults and failure information through the Transmission Regulatory Reporting Packs and it is proposed the Transmission Licensees will draw on the existing reporting supplemented by consistent reporting of Average Circuit Unreliability.

62. Average Circuit Unreliability is derived from the unavailability of the network due to outages occurring as a result of reliability reasons which cannot be deferred until the next planned intervention and is defined as:

--

63. The events which are classified as being included within the definition of Average Circuit Unreliability are:
    a. Enforced reliability outages taken at less than 24 hours' notice (otherwise known as unplanned unavailability)
    b. Planned reliability outages taken after 24 hours notice

64. Currently the outage planning tool TOGA (Transmission Outage and Generator Availability) does not contain the reporting categorisation required to produce Average Circuit Unreliability for the Transmission Licensees. National Grid currently uses reports out of TOPAM (Transmission Outage Planning and Monitoring) to produce this data and SPTL use reports out of OPD (Outage Planning Diary) but this requires significant manual categorisation and further work is required to define and implement processes within the GB System Operator and the Transmission Licensees to ensure the data is produced consistently across the Transmission Licensees. These processes and TOGA software developments will be delivered during winter/spring 2008/09 and data sets built up over time.

5.3.3 Reporting

65. Average Circuit Unreliability is a network related measure. Outages taken for reliability reasons whether planned or enforced have an impact on the reliability of service.

66. The total number of circuits which this calculation is based on varies by Transmission Licensee and will vary from year to year as the networks are modified. For this reason it is proposed to report the number of circuits used as part of this calculation as at 31 March each year in the Transmission Regulatory Reporting Packs which will be sent to The Authority on 31 July each year.

67. Figure 6 shows the output to be delivered as part of the Network Output Measures for Network Performance.

Figure 6: Proposed Revised Network Performance Regulatory Reporting Table

Average Circuit Unreliability					TO Comments
Year	Month	Units	Value	Number of Circuits	
2009	April	%			
2009	May	%			
2009	June	%			
2009	July	%			
2009	August	%			
2009	September	%			
2009	October	%			
2009	November	%			
2009	December	%			
2010	January	%			
2010	February	%			
2010	March	%			

68. Reporting of Unplanned Unavailability is already included in the GB Transmission System Performance Report and the Transmission Regulatory Reporting Pack and Average Circuit Unreliability is included in National Grid's Transmission Regulatory Reporting Pack. It is the intention of all Transmission Licensees to produce Average Circuit unreliability following acceptance of the Network Output Measures proposals.

69. A further proposal is that the reporting of Unplanned Unavailability and Average Circuit Unreliability is rationalised across the various reports to ensure consistency, and avoid overlaps and duplication.

5.3.4 Development Work Required

70. Development of processes in the GB System Operator and Transmission Licensees to support the reporting of Average Circuit Unreliability.

71. TOGA will need to be developed to allow the Transmission Licensees to consistently report Average Circuit Unreliability. It is anticipated the required developments to TOGA and the associated processes developed by the GB System Operator and Transmission Licensee will be competed by winter/spring 2008/2009.

5.3.5 Additional Material Included within Transmission Licensees' Specific Appendices

72. Each Transmission Licensee will cover how Network Performance will be implemented within their Specific Appendix.

[redacted]

[redacted]

5.4 Network Capability

5.4.1 Licence Requirements

74. Paragraph 2 (d) requires the Transmission Licensees to develop a Network Output Measure to enable the evaluation of:
    a. The level of the capability and utilisation of the Licensee's Transmission System at entry and exit points and other network capability and utilisation factors ('network capability')

75. The key elements from this Licence Condition are:
    a. Information about Transmission System Capability
    b. Information about Transmission System Utilisation

5.4.2 Methodology

76. The Transmission Licensees currently report on transmission system capability as part of the Transmission Regulatory Reporting Pack. It is intended that the capability sections from Table 4.8 "Boundary Transfers and Capability" will be used to meet the requirements of the Licence Condition. This will provide a measure of the existing and future transmission capacity being provided by the Transmission Operators on the main interconnected transmission system.

77. Likewise, the Transmission Regulatory Reporting Pack requires the individual Transmission Licensees "to collect information relating to more localised demand driven need for developing transmission infrastructure". This is presented in Table 4.9 "Demand and Supply Capacity at Substations" with Utilisation being represented as demand as a percentage of capacity. This will show the relationship between localised demand and capacity and hence provide a proxy measure for utilisation.

78. Adopting these measures will provide:
    a. Consistency in reporting and interpretation of requirements across all Transmission Licensees
    b. Prevent duplication in reporting on Capability and Utilisation Measures

5.4.3 Reporting

79. Figure 7 shows the table which will be submitted to reflect the 'capability' requirement.

Figure 7: Network Capability Regulatory Reporting Table

Boundary	Responsible TO	y-7 00/01	y-6 01/02	y-5 02/03	y-4 03/04	y-3 04/05	y-2 05/06	y-1 06/07	y 07/08	y+1 08/09	y+2 09/10	y+3 10/11	y+4 11/12	y+5 12/13
Required Capability (GW)														
1 North West	SHETL													
2 North South	SHETL													
3 South West	SHETL													
4 SHETL-SPT	SHETL & SPT													
5 SPT North - South	SPT													
6 SPT - NGC Boundary	SPT & NGET													
7 Upper North - North	NGET													
8 North to Midlands	NGET													
9 Midlands to South	NGET													
10 South Coast	NGET													
11 North East & Yorkshire	NGET													
12 South & South West	NGET													
13 South West	NGET													
14 London	NGET													
15 Thames Estuary	NGET													
16 North East, Trent & Yorksh	NGET													
17 West Midlands	NGET													
Actual Capability (GW)														
1 North West	SHETL													
2 North South	SHETL													
3 South West	SHETL													
4 SHETL-SPT	SHETL & SPT													
5 SPT North - South	SPT													
6 SPT - NGC Boundary	SPT & NGET													
7 Upper North - North	NGET													
8 North to Midlands	NGET													
9 Midlands to South	NGET													
10 South Coast	NGET													
11 North East & Yorkshire	NGET													
12 South & South West	NGET													
13 South West	NGET													
14 London	NGET													
15 Thames Estuary	NGET													
16 North East, Trent & Yorksh	NGET													
17 West Midlands	NGET													

80. Figure 8 shows the table which will be submitted to reflect the 'utilisation' requirement.

Figure 8: Network Utilisation Regulatory Reporting Table

	y-4 03/04	y-3 04/05	y-2 05/06	y-1 06/07	y 07/08
Number of substations within (demand / non-SGTcapacity) % bands					
Peak demand / intact capacity					
>120%					
110%-120%					
100%-110%					
90%-100%					
80%-90%					
<80%					
No Capacity					
Seasonal peak demand / n-1 capacity					
>120%					
110%-120%					
100%-110%					
90%-100%					
80%-90%					
<80%					
No Capacity					
Maintenance period demand / n-2 capacity - >300MW demand groups					
>120%					
110%-120%					
100%-110%					
90%-100%					
80%-90%					
<80%					
No Capacity					

81. The rules for creating Table 4.8 are taken from the "Price Control Review Reporting Rules: Instruction and Guidance". Further information is as follows:
    a. Boundaries: A system boundary splits the network into two parts across which transfer capabilities can be assessed
    b. Planned Transfer: This is defined within the GB Security and Quality of Supply Standard (SQSS)
    c. Boundary Capability: Assessed as according to the GB SQSS
    d. Boundary Transfer Capacity: As defined in the GB SQSS if the two parts either side of the boundary are of applicable sizes, otherwise apply an equivalent scaling to the generation and demand

82. The rules for creating Table 4.9 are taken from the "Price Control Review Reporting Rules: Instruction and Guidance". The most recent information should be used from the most recent business planning studies. Other definitions:
    a. Supply Capacity: Assessed as per the GB SQSS in two separate ways – limited by supergrid transformer (SGT) capacity or limited by any other factors
    b. Peak Demand: The maximum demand of the demand group at the substation
    c. Seasonal Peak Demand: Equal to peak demand or if more onerous conditions arise with lower demand and the accompanying relevant rating
    d. Maintenance Period Demand: As defined in GB SQSS
    e. Intact Capacity: The capacity with no local outages
    f. n-1 Capacity: The first circuit outage condition as defined in GB SQSS
    g. n-2 Capacity (300MW demand groups only): The second circuit outage condition as set out in the GB SQSS – only applicable for substations where the peak group demand is greater than 300MW

5.4.4 Additional Material Included within Transmission Licensees' Specific Appendix

83. There is no additional output required in the Transmission Licensees' Specific Appendices.

5.4.5 Development Work Required

84. There is no additional development work proposed for Network Capability.

[redacted]

6.0 FURTHER DEVELOPMENT WORK

86. This section summarises the areas of Methodology Statement development which have already been identified during the previous paragraphs:
    a. For Network Asset Condition there are no identified areas for development
    b. For Network Risk further development work is required in three areas:
        i. The definition of System Criticality
        ii. The development of a common comparable scale for System, Safety and Environment Criticality
        iii. The definition of Replacement Priority
    c. For Network Performance further development is required in two areas:
        i. Development of processes in the GB System Operator and Transmission Licensees to support the reporting of Average Circuit Unreliability
        ii. TOGA will need to be developed to allow the Transmission Licensees to consistently report Average Circuit Unreliability
    d. For Network Capability there are no identified areas for development

87. It is anticipated the required developments to TOGA and the associated processes developed by the GB System Operator and Transmission Licensees will be competed by winter/spring 2008/2009.

88. From feedback received during the workshop held with interested parties. the Transmission Licensees will also investigate the benefits of reporting:
    a. Average Circuit Unreliability statistics for the four equipment groups reported under Network Asset Condition and Network Risk
    b. Average Circuit Unreliability events using a statistical distribution of outage time

7.0 COMPARATIVE ANALYSIS

7.1 Licence Requirements

89. Within this section the Transmission Licensees have considered the following parts of the Licence Condition:
    a. The Network Output Measures shall be designed to facilitate the comparative analysis over time between:
        i. Geographic areas of, and network assets within the Licensee's transmission system
        ii. Transmission systems within Great Britain
        iii. Transmission systems within Great Britain and within other countries
        iv. Transmission systems and Distribution Systems within Great Britain

7.2 Transmission Systems within Great Britain

90. By developing a joint methodology across the Transmission Licensees the Network Output Measures will be produced in the same format and allow comparative analysis across Transmission Licensees.

7.3 Transmission Systems within Great Britain and Other Countries

91. The names of specific companies have not been included within this Methodology Statement to enable external publication of these comparisons.

92. In addition to the development of the Network Output Measures, the three Transmission Licensees have researched methods used to report similar measures within Great Britain and other countries. Examples of these systems are Condition Based Risk Management, Asset Health Indices and Criticality Indices. Whilst adopting a methodology used by other transmission companies would indicate the outputs will have the same definitions, the evidence collected shows these methodologies are highly configurable so the companies using them can obtain the outputs they need. For this reason, adopting methodologies used by other transmission companies will not lead to outputs based on the same definitions unless the companies are required to provide the output to comply with a common framework e.g. Distribution Regulatory Reporting Packs.

93. National Grid supported the establishment of and is representing the UK on, the recently convened CIGRE working group C1.16 which has been set up to develop Electricity Transmission thinking on Transmission Asset Risk Management. The working group has found that companies are only reporting on elements of Network Risk due to:
    a. Lack of complete data
    b. Information being retained by specialists

7.4 Transmission Systems and Distribution Systems within Great Britain

94. Throughout the development of the Network Output Measures proposals, the Transmission Licensees have reviewed the Distribution Regulatory Reporting Pack templates to ensure consistency in reporting across transmission and distribution.

7.5 Additional Comparative Analysis

95. The names of specific companies have not been included within this Methodology Statement to enable external publication of these comparisons.

96. In rail a process has been developed for the optimisation of maintenance regimes for safety critical assets. This takes into account financial and safety risk associated with the assets. The process follows five key steps:
    a. Identify failure modes/root cause and analyse how deterioration occurs
    b. Assess and quantify maintenance and failure costs
    c. Link failure modes directly with mitigating maintenance tasks
    d. Use software tools to model cost-risk optimisation maintenance intervals
    e. Provide an ALARP (As Low As Reasonably Practicable) safety justification for the new maintenance regime

97. In rail an Asset Stewardship Index (ASI) has been developed which provides an overall measure on all aspects of asset stewardship, including:
    a. Safety
    b. Quality (Condition and Capability)
    c. Performance

    The measures provide coverage across most of the asset types and have been weighted to reflect the importance of the assets to the overall ASI measure. This is then used to determine if the asset stewardship is improving or deteriorating. This measure is used as an incentive but the incentive is only positive.

98. In highways Performance Indicators have been developed to monitor their performance over time and measure the effectiveness of their process. These are set every year.

99. The 'Capital Maintenance Planning: Common framework' for the UK water industry, is based on the analysis of risk (specifically the probability and consequences of asset failure) and encompasses an economic approach which allows the trade-off between capital and operational cost options. The forward looking risk based aspect of the framework encourages consideration of the optimal balance between proactive and reactive maintenance as well as Opex and/or Capex solutions and assists in identifying the economic level of capital maintenance.

100. This additional comparative analysis highlights that the Transmission Licensees are covering the main areas identified from other relevant industry sectors.

8.0 ONGOING REVIEW AND DEVELOPMENT OF NETWORK OUTPUT MEASURES

8.1 Licence Requirements

101. Within this section the Transmission Licensees have considered the following parts of the Licence Condition:
    a. The Transmission Licensee shall at all times keep the approved Network Output Measures Methodology under review to ensure that it facilitates the objectives
    b. The Transmission Licensee shall make such modifications to the approved Network Output Measures Methodology as may be required to better facilitate the objectives
    c. The Transmission Licensee shall unless The Authority has within 28 days of the report being finished to it given a direction that the modifications may not be made, implement the modifications to the Network Output Measures Methodology

8.2 Process to Modify Network Output Measures

102. Once the initial development of the Network Output Measures is concluded, the Transmission Licensees will jointly review the Network Output Measures, ensure they are still meeting the objectives of the Licence Condition and propose further developments of the measures.

103. The Methodology Statement will be jointly agreed and reissued each year following this review to reflect any proposed changes or further developments to ensure it facilitates the objectives of the Licence Condition. The Transmission Licensees will also conduct three other teleconferences during the year (probably at 3 monthly intervals in between the annual face-to-face meeting) to discuss common issues with the Network Output Measures.