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NSP/009/002 Technical Specification for the Provision of Active Network Management and Associated Services

1. Purpose

The purpose of this document is to detail the active network management (ANM) services and provisions that Northern Powergrid requires to procure as part of the enterprise active network management supply and support tender alongside the ANM system as detailed in the Technical Specification for Enterprise Active Network Management Schemes, NPS/007/020.

This document supersedes the following documents, all copies of which should be withdrawn from circulation.

Document Reference	Document Title	Version	Published Date
NSP/009/002	Technical specification for the provision of active network management and associated services	2.0	March 2024

2. Scope

The scope of this document is limited to the support services and provisions that Northern Powergrid requires as part of the active network management supply and support tender.

The main items included in the scope of this document are, but are not limited to:

- ANM System design support;
- ANM System Integration support;
- Factory, site and user acceptance testing scripts;
- Initial and on-going system configuration and tuning;
- ANM System commissioning support including on-site and remote assistance;
- Post commissioning support including on-site and remote assistance as part of a service contract;
- Warranties;
- Maintenance services;
- Patches and upgrades;
- Training on-site including training material;
- Quality assurances; and
- All product licences.

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3. Requirements

3.1. Anticipated ANM Schemes

It is difficult to quantify the number of ANM schemes that will be realised during the RIIO (revenue = incentives + innovation + outputs) period two running from 2023 to 2028 as there are many variables that influence customer connections. As such this is a contract with no guaranteed volumes. In order to provide the means to compare costs between vendors, Northern Powergrid requires costs to be provided in line with the high-level requirements set out in appendix 1.

The following high level scheme volumes should be used for tender purposes, but no guarantees are given that these levels will materialise:

- Thirty-two or more ANM schemes
- 10 ANM customers per scheme
- 15 constraint locations per scheme

Day rates will also be required for any works that fall outside of the core of ANM provision contained in this document.

The proposed contract term is flexible to cover the whole of the RIIO 2 period extendable throughout on a 3 + 3 + 2-year basis.

3.2. System Design and Support

3.2.1. Initial and Ad-hoc Network Analysis

Ideally Northern Powergrid require the provision of the services stated in this section 3.2.1; however, due consideration will also be given to tenders that do not offer all of the services herein.

Northern Powergrid will provide:

- A single-line diagram of the relevant section of the distribution system;
- Geographic map(s) of the relevant section of the distribution system;
- Circuit ratings, for normal running conditions and first outage, and for normal and reverse power flow;
- Managed Customer rating, ramp rate and position in the merit order;
- At least one recent year's worth of half hourly load profile data (real and reactive power) for all relevant primary, supply point and grid supply point substations and the same for any relevant HV (or higher voltage) feeder circuits;
- At least one year's worth of export / import data associated with any existing material customer connections¹;
- At least one recent year's worth of anonymised export / import profile data associated with any existing customers of a type similar to any new, ANM controlled customers for use as a pro-rata proxy for new customers and / or the new customers own expected profile data.

The vendor will:

¹ There may be restrictions on the specifics of any data provision such that it may be anonymised in some way and / or the third party may have to sign a non-disclosure agreement.

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- Identify the critical circuits which require monitoring;
- Define the rule set to manage the Managed Customer(s) real and / or reactive power import and / or export to avoid breaching circuit ratings;
- Assess likely constraints for each Managed Customer;

This information and assessment applies both for any separate ANM schemes on different parts of the distribution system, and for any changes to an existing ANM scheme once commissioned (e.g. generators entering or leaving such schemes). The bidder's/vendor's methodology shall be suitable for the complexity and interaction of distribution systems / number of Managed Customer / number and location of critical constraint locations etc. i.e. for relatively simple scenarios involving for example a single constraints and a small number of generators a spreadsheet-based analysis may be appropriate, for any more complex arrangements the use of power systems software analysis tools running multiple scenario analyses will be more appropriate. The analysis carried out by the vendor shall be suitable for use by the Managed Customer to undertake an initial assessment of the viability of their proposed connection. This analysis shall include an estimate of the amount of energy import / export expected to be constrained, accounting for the customer's position in the queue, based on the agreed Principle of Access e.g. a last in first out (LIFO). The vendor shall be capable of providing the aforementioned information within 20 working days of receipt of all information necessary for such studies from Northern Powergrid.

3.2.2. Scheme Design

The vendor shall be responsible for producing a high-level scheme design that informs Northern Powergrid of the location of all ANM scheme components and the interface requirements in terms of inputs and outputs from each location required for the effective operation of the ANM scheme in accordance with the Technical Specification for Enterprise Active Network Management Schemes, NPS/007/020.

3.2.3. Drawings

The vendor shall be responsible for providing the necessary drawings to support compliance with the requirements of 3.2.1 and 3.2.2 above. General arrangements drawings of how all ANM scheme components would need to be connected to form the ANM system shall be provided by the vendor. Detailed control and protection type drawings relating to the ANM scheme are not included in the scope of supply; however, assistance with their production will be necessary.

3.3. System Integration, Configuration Support and Commissioning

3.3.1. ANM System Integration

Northern Powergrid shall supply details of all interfaces in to and out of the system. The vendor shall, collaborating with third parties directly where reasonably required, configure the system for the effective operation of such interfaces. The vendor shall support the end-to-end integration of the ANM system to transducers, interposing relays, etc., for initial installation and on-going operation and maintenance.

If required, either us or a third party appointed by us, shall install and connect any additional equipment needed, including transducers, interposing relays, small wiring, etc.

Installation programmes if required will be drawn up by Northern Powergrid in consultation with the vendor once the sites have been agreed.

3.3.2. Initial System Configuration

The vendor shall support and advise on the configuration of all equipment in accordance with the system design. Where additional information is required from Northern Powergrid, such as the margin of safety to be built in to standard and thresholds, the vendor shall discuss this with Northern Powergrid and offer technical assistance in defining those values.

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3.3.3. Off-line Testing

The vendor shall use the test system provided as part of the Technical Specification for Enterprise Active Network Management Schemes, NPS/007/020, to simulate the actions of the ANM scheme as far as is reasonably practical. This requirement shall form part of the factory acceptance testing (FAT) required in section 3.3.4.

3.3.4. Factory, Site and User Acceptance Testing

The vendor shall propose scripts for factory, site and user acceptance tests (FAT, SAT and UAT), to be approved by Northern Powergrid.

The vendor shall carry out and verify FAT, with any observers that Northern Powergrid specifies.

The vendor shall, under Northern Powergrid's supervision and with such assistance from Northern Powergrid as may reasonably be required, perform end-to-end commissioning tests for SAT and any further UAT reasonably required by Northern Powergrid.

Where there is a requirement to modify the ANM system, or to other systems which interface with it, the vendor shall propose scripts for regression testing, to be approved by Northern Powergrid and tested on the test system provided as part of successful tender for an ANM system. The vendor shall carry out and verify those tests, with any observers that Northern Powergrid specifies.

The vendor shall provide such facilities as may reasonably be required for off-line testing of modifications and parameter changes.

3.3.5. System Commissioning Support including On-site and Remote Assistance

Commissioning of the ANM system shall be carried out either by third party resource appointed and overseen by Northern Powergrid personnel, or by Northern Powergrid itself, and supported by the vendor. Such support shall include the on-site and remote expertise as may be necessary in order to ensure that all aspects of the ANM system function as required and meet the requirements of the Technical Specification for Enterprise Active Network Management Schemes, NPS/007/020.

3.3.6. On-going Configuration Requirements and Tuning

Configuration includes any work to customise the generic application, such that it provides the functionality set out in Technical Specification for Enterprise Active Network Management Schemes, NPS/007/020, including but not limited to:

- Importing and establishing a model of the distribution system;
- Mapping Monitoring Points to Managed Customers;
- Configuring the Principle of Access;
- Configuring ANM system thresholds, including distribution system asset parameters;
- Configuring Mapping Points and Local ANM Controllers;
- Configuring the interface between the ANM system and DMS;
- Configuring the interface between the Local ANM Controller and the relevant Managed Customer's interface; and
- Adding a new Managed Customer to an existing ANM constraint management zone.

After any design work for new or modified schemes, the vendor shall configure the ANM system as required.

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The vendor shall continuously the monitor the operation of the ANM system and compare it the performance expected from the ANM scheme established at the design stage. Examples of areas that should be monitored include:

- Confirmation that threshold limits (relating to distribution system capability) at Monitoring Points are not being exceeded routinely;
- Confirming that Managed Customers are only constrained in accordance with the relevant Principle of Access;
- The proportion of the time when the ANM system issues control instructions / set points;
- Whether Managed Customers are being de-energised routinely for non- compliance with their control instructions / set point values; and
- Confirming that small changes in control instructions / set point values are not issued frequently.

Where monitoring the operation of the ANM system identifies the need, or opportunity, to change user-configurable parameters, the vendor shall identify this to Northern Powergrid and propose new values. Once agreed by Northern Powergrid, the vendor shall make such changes.

3.4. Post Commissioning Support including On-site and Remote Assistance as Part of a Service Contract

The intent of this support agreement is to provide all the technical resource required for the effective operation of the ANM system, so that Northern Powergrid need only oversee those activities. This includes on-going support through to the end of the contract period.

3.4.1. On-going Support

The bidder shall quote for three different levels of help desk staffing and two different levels of support:

- A help desk manned by technically competent staff 08:00-18:00 each working day in England, and service-affecting issues resolved within two working days;
- A help desk manned by technically competent staff 08:00-18:00 each working day in England, and service-affecting issues resolved within four hours;
- A help desk manned by technically competent staff 08:00-18:00 seven days per week, and service-affecting issues resolved within two working days;
- A help desk manned by technically competent staff 08:00-18:00 seven days per week, and service-affecting issues resolved within four hours;
- A help desk manned by technically competent staff around the clock, except Christmas Day, and service-affecting issues resolved within two working days;
- A help desk manned by technically competent staff around the clock, except Christmas Day, and service-affecting issues resolved within four hours.

Any general queries raised with the help desk, or non- service-affecting issues, shall be resolved within one calendar month.

The vendor shall include on-site support for fault-finding and rectification purposes with a view to providing on-site assistance within two working days of fault notification by Northern Powergrid and fault mitigation within one calendar month.

Arrangements for implementing any configuration changes, patches or upgrades shall be agreed by Northern Powergrid in advance as the requirement is that such changes can be made without interrupting continuity of the ANM service.

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3.4.2. Patches and Upgrades

The vendor shall provide, install, test and commission, where agreed with Northern Powergrid, any patches or upgrades identified during business with Northern Powergrid or any other client.

3.4.3. Routine Reporting

The vendor shall generate routine reports, to be agreed by Northern Powergrid, which are issued monthly a sample of the reports is provided in Appendix 2 of the Technical Specification for Enterprise Active Network Management Schemes, NPS/007/020.

These shall cover but not limited to:

- Availability for each Managed Customer;
- The constraint amount, i.e. where thresholds have been breached for each critical circuit;
- A review of parameters, including but not limited to standard and back-stop thresholds, to identify whether the present parameters strike the right balance between robustness and availability;
- Communications failures;
- Managed Customer's failure to respond;
- ANM systems failures, with commentary on each incident.

Any amendments reasonably required by Northern Powergrid to these reports shall be made by the vendor, such changes not to be applied retrospectively.

- The constraints applied to each Managed Customer. This would be a Managed Customer focussed report indicating the extent to which Managed Customers had been constrained. A sample report, detailing the required reporting information for curtailable connections, is provided in Appendix 2 of the Technical Specification for Enterprise Active Network Management Schemes, NPS/007/020;
- The distribution system assets that have triggered the constraint of Managed Customers. This would be a distribution system asset focussed report demonstrating that critical distribution system assets were being managed effectively by the ANM System;
- A review of ANM system configuration parameters, thresholds and operational instances when thresholds are breached. This would be an ANM system focussed report to demonstrate whether the present configuration strike the right balance between minimising the constraints applied to Managed Customers and ensuring the duty imposed on a critical distribution system asset does not exceed its capability, or whether ANM system parameters should be revised and further tuned. This report could be based on a sample operational period;
- Managed Customer's failure to respond to a control instruction / set points; and
- ANM systems failures including communications failures, with commentary on each incident.

3.4.4. Ad-hoc Reporting

The vendor shall investigate, and report as reasonably requested by Northern Powergrid on issues including but not limited to:

- Specific Managed Customer or Northern Powergrid concerns over constraints imposed; and
- Specific Northern Powergrid concerns over system performance.

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3.4.5. Maintenance Services

So far as is reasonably required to ensure effective operation of the system, the vendor shall:

- Monitor performance of the application and database;
- Carry out routine maintenance tasks (clearing down data tables, etc.);
- Identify to Northern Powergrid any issues with the Central ANM Controller, Local ANM Controllers or Monitoring Points; and
- Identify issues with the Central ANM Controller, Local ANM Controllers or Monitoring Points that may require on-site works, and provide such assistance (on site where appropriate) as is reasonably required to maintain the overall health and fitness for purpose of the ANM system.

3.4.6. Training On-site including Training Materials

The vendor shall provide comprehensive training on the ANM system to be supplied, at Northern Powergrid's premises, for all potential users of the system (recognising that different user groups have different requirements), including:

- Control engineers;
- Technical services fitters and engineers (SCADA and protection);
- Real-time systems support staff; and
- NPg appointed contractors.

The training shall be to such a level that on completion of the courses, Northern Powergrid's or their appointed staff shall be able to design, programme, configure, install, operate and maintain the system and associated equipment over its operational lifetime.

Those staff shall also be able to perform diagnostic maintenance and troubleshoot the system and associated equipment up to the point where, due to the nature of the fault, the vendor recommends calling out specialist assistance/services, typically provided by the vendor. Training content shall include, as a minimum:

- Software and hardware overview;
- Operations, data and communication interfaces & protocols;
- Installation, modification and configuration of the system;
- Programming / algorithms, etc.;
- Database management;
- Routine & fault diagnostics, maintenance tools and test equipment; and
- Failure modes and corrective procedures.

This shall be backed up by detailed documentation of the ANM system, specifically in how it is operated and user-configured.

The vendor shall also provide appropriate awareness training for design engineers and operational staff, again backed up by suitable documentation.

Provision should be made for one suite of training courses covering the above. Additional training courses may be required in future and shall be based on the above but are excluded from this tender.

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It is estimated that there may be up to 15 members of staff in each of the different user groups mentioned above that will require some formal training.

3.4.7. Archiving

The ANM system should retain a minimum of three month's system log data. Where for system performance or storage reasons such data needs to be overwritten, it should be copied to an appropriate archive in advance of any over writing activities taking place. Both the system log data held in the ANM system and any archived system log data should be held in an easily accessible format, which will be proposed by the bidder and agreed by Northern Powergrid. Archived system log data shall be capable of being retained for the duration of the contract.

Note that this requirement relates to system log data; system data (i.e., received data, calculated values, control instructions / set points) and actions shall be retained in a local data historian for at least three years and be accessible to authorised users. After three years, such system data may be archived subject to the agreement of Northern Powergrid.

3.5. Warranties

There shall be a warranty period associated with the ANM system, which shall be for a period of 12 months, as a minimum. The bidder shall provide details of their warranty arrangements and any extended warranty offers.

The warranty period will commence from the date of issue of a notice of 'Final Acceptance' by Northern Powergrid.

The vendor shall provide both remote and local technical / maintenance support during this period, as required. Site visits by vendor's staff to Northern Powergrid to solve any issues covered by the warranty shall be provided free of charge.

3.6. Quality Assurances

The bidder/vendor is required to control the quality of all deliverables within his scope of supply. This activity shall be documented in a manner that provides a high degree of assurance that the required level of product quality has been achieved.

In addition to covering the ANM system, this control shall encompass all aspects of the bidder/vendor works such as project management, documentation, software design, testing, implementation activities and commissioning.

The bidder/vendor shall ensure that deliverables are developed and tested in accordance with a suitable Quality Assurance Programme and that additionally normal factory test procedures are performed before final testing and shipping.

For the required level of quality assurance to be achieved, the bidder/vendor shall demonstrate that he has a functional and adequately documented Quality Management System formulated to satisfy the requirements of the ISO-9001 and ISO-9002 standards standard. The bidder/vendor's Quality Assurance Plan shall be subject to approval by Northern Powergrid.

Northern Powergrid reserves the right to carry out quality assurance inspections and audits if deemed necessary. The bidder/vendor shall make all necessary arrangements and efforts to facilitate these inspections and audits.

3.7. Product Licences

All software licences required for proper operation of the system shall be included in the bidder's offer. Licences shall be provided as Northern Powergrid company-wide licences.

All costs associated with licences shall be included within the ANM system bidder's offer.

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3.8. Variations

The vendor shall inform Northern Powergrid of any such likely variations as soon as they become aware of them, and then any variations in delivered equipment shall be agreed in advance in writing with Northern Powergrid.

3.9. Reference Sites

The vendor shall provide evidence of this system, or a similar previous version, having been successfully deployed at least twice. The vendor shall, so far as is reasonably practicable, arrange for site visits or similar verification and information exchange between the users of those existing deployments and the buyer.

The system offered shall have been proven by satisfactory operating experience, for a minimum period of three years, in similar operating conditions.

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4. References

4.1. External Documentation

Reference	Title
ISO 9001, 2015	Quality Management Systems (QMS)
ISO 9002, 1994	Model for quality assurance in production, installation and servicing

4.2. Internal Documentation

Reference	Title
NPS/007/020	Technical Specification for Enterprise Active Network Management Schemes

4.3. Amendments from Previous Version

Reference	Description
Whole document	Whole document review

5. Definitions

Definition	Term
Active network management	A system that manages power flows on an electricity distribution network by issuing real power set-point instructions to participating customers to alter their import/export with a view to maintaining power flows within pre-determined limits that do not exceed asset capabilities.
Bidder	The company that is tendering to provide active network management equipment and/or services.
Customer	A person who is already connected to or is seeking a connection to Northern Powergrid's distribution system, including an Embedded Network Operator.
Constraint	A limitation on the electricity network to deliver power beyond a certain level, whether related to a physical asset or regulatory requirement. Currently limited to thermal, forward / reverse power flow and voltage constraints.
FAT	Factory acceptance test.
I/O	Input/output.
Principles of Access	High level principles that set out the order in which participating customers are to be constrained.
RIIO-ED2	Revenue = Incentives + Innovation + Outputs – Electricity Distribution Price Control 2.
RTU	Remote Terminal Unit.
SAT	Site acceptance test.
SCADA	Supervisory control and data acquisition
Set point	A target MW value issued by the ANM system that is not to be exceeded by a participating customer.
UAT	User acceptance test.
Vendor	The company that is to provide active network management equipment and/or services.

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6. Authority for Issue

6.1. CDS Assurance

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

		Date
Deb Dovinson	Governance Administrator	08/07/2024

6.2. Author

I sign to confirm that I have completed and checked this document and I am satisfied with its content and submit it for approval and authorisation.

Review Period - This document should be reviewed within the following time period:

Standard CDS review of 3 years?	Non-Standard Review Period & Reason	
Yes	Period: n/a	Reason: n/a
Should this document be displayed on the Northern Powergrid external website?		Yes
		Date
Rose Wabuti	Smart Grid Development Engineer	08/07/2024

6.3. Technical assurance

I sign to confirm that I am satisfied with all aspects of the content and preparation of this document and submit it for approval and authorisation.

		Date
Alan Creighton	Senior Smart Grid Development Engineer	09/07/2024
Jeremy Meara	Operational Data and Systems Manager	08/07/2024

6.4. Authorisation

Authorisation is granted for publication of this document.

		Date
Mark Callum	Smart Grid Development Manager	08/07/2024
Paul Black	Head of System Engineering	15/07/2024

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Appendix 1 – Schedule of Costs

The bidder should account for all costs by providing the following information:

1 Pricing details for the delivery and implementation of the ANM system.

Delivery and implementation of the ANM system			
	Year 1	Year 2 (if needed)	Total
	Cost (£)	Cost (£)	Cost (£)
Implementation services – core ANM application:			
• Project management			
• Technical specialists			
• Trainers (for user training)			
• Other (please specify):			
•			
Implementation services - redundant multi-site configuration:			
• Project management			
• Technical specialists			
• Other (please specify):			
•			
Implementation services – backup arrangements:			
• Project management			
• Technical specialists			
• Other (please specify):			
•			
Implementation services - providing an ANM graphical user interface located at each of two control centres			
• Project management			
• Technical specialists			
• Other (please specify):			
•			
Implementation services - interface with our DMS/ADMS			
• Project management			
• Technical specialists			
• Other (please specify):			
•			
Software:			

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Delivery and implementation of the ANM system			
• Initial licence fee			
• Other (please specify):			
•			
Other (please specify):			
•			
•			
Total			

2 Delivery of a Grid Supply Point based ANM scheme managed by the Central ANM controller.

These shall be incremental costs over and above those associated with implementation of the core system. For the purpose of providing these costs please provide the per scheme estimated cost of the delivery of an ANM scheme.

Please provide these per scheme estimated costs, on three different bases:

- For a small scheme, with up to 2 Managed Customers in the scheme and up to 5 constraint Monitoring Points;
- For a medium scheme, with up to 10 Managed Customers in the scheme and up to 15 constraint Monitoring Points; and
- For a large scheme, with up to 20 Managed Customers in the scheme and up to 35 constraint Monitoring Points.

Please also provide suggestions and recommendations for i) the most time-efficient way (i.e. shortest elapsed time), and ii) the most cost-efficient (i.e. least cost), of delivering ANM schemes covering 32 Grid Supply Points / Supply Points.

Please provide pricing details for the delivery of a Grid Supply Point / Supply Point based ANM scheme system using the headings below:

Delivery of a Grid Supply Point/Supply Point based ANM scheme	
Small scheme	
Item	Cost (£)
Scheme design	
Constraint assessments	
Scheme deployment; including: <ul style="list-style-type: none"> • scheme set up, configuration, factory acceptance testing, pre-production testing, tuning, reporting set up, go-live, and post go-live support 	
Other (please specify):	
•	

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Delivery of a Grid Supply Point/Supply Point based ANM scheme	
Small scheme	
•	
Total	

Delivery of a Grid Supply Point/Supply Point based ANM scheme	
Medium schemes	
Item	Cost (£)
Scheme design	
Constraint assessments	
Scheme deployment; including: <ul style="list-style-type: none"> scheme set up, configuration, factory acceptance testing, pre-production testing, tuning, reporting set up, go-live, and post go-live support. 	
Other (please specify):	
•	
•	
Total	

Delivery of a Grid Supply Point/Supply Point based ANM scheme	
Large scheme	
Item	Cost (£)
Scheme design	
Constraint assessments	
Scheme deployment; including: <ul style="list-style-type: none"> scheme set up, configuration, factory acceptance testing, pre-production testing, tuning, reporting set up, go-live, and post go-live support. 	
Other (please specify):	

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Delivery of a Grid Supply Point/Supply Point based ANM scheme	
Large scheme	
•	
•	
Total	

3 Ongoing support and maintenance

Please provide pricing details of ongoing support and maintenance costs for the ANM system using the headings below:

Ongoing Support and Maintenance					
	Yr1	Yr2	Yr 3	Yr 4	Yr 5
	Cost (£)	Cost (£)	Cost (£)	Cost (£)	Cost (£)
Annual software support fee					
Annual 3 rd line support fee (if different from above) on the following bases:					
• A help desk manned by technically competent staff 08:00-18:00 each working day in England ² , and service-affecting issues resolved within two working days.					
• A help desk manned by technically competent staff 08:00-18:00 each working day in England, and service-affecting issues resolved within four hours.					
• A help desk manned by technically competent staff 08:00-18:00 seven days per week, and service-affecting issues resolved within two working days.					
• A help desk manned by technically competent staff 08:00-18:00 seven days per week, and service-affecting issues resolved within four hours.					

² This requirement refers to a technical support option where the help desk is available on every working day aside from those public holidays (i.e. days on which most businesses and non-essential services are closed) recognised in England. To be clear, it does not mean that the help desk should be located in England.

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Ongoing Support and Maintenance					
<ul style="list-style-type: none"> A help desk manned by technically competent staff around the clock, except Christmas Day, and service-affecting issues resolved within two working days. 					
<ul style="list-style-type: none"> A help desk manned by technically competent staff around the clock, except Christmas Day, and service-affecting issues resolved within four hours. 					
Security patching					
Other (please specify):					
<ul style="list-style-type: none"> 					
<ul style="list-style-type: none"> 					
Total					

Please provide details of the basis on which the recurring annual costs above shall be adjusted to take account of indexation. For example, is it expected that the index to be used shall be as published by the Office for National Statistics in the Consumer Prices Index including owner occupiers' housing costs (CPIH), or will it be an alternative measure.

Please indicate if it is expected that adjustment mechanism will have a cap (maximum increase) and collar (minimum increase) in place.

4 Scheme re-configurations

We recognise that scheme maintenance can be an ongoing obligation and that it can be necessary to re-configure and/or update ANM schemes in order to take account of changing operational circumstances (including but not limited to changes in network topology etc.)

Please provide details of the typical cost of maintaining a scheme over a 5-year period on three different bases:

- For a small scheme, with up to 2 Managed Customers in the scheme and up to 5 constraint Monitoring Points;
- For a medium scheme, with up to 10 Managed Customers in the scheme and up to 15 constraint Monitoring Points; and
- For a large scheme, with up to 20 Managed Customers in the scheme and up to 35 constraint Monitoring Points.

Scheme reconfigurations – small scheme	
Item	Cost (£)
Cost of scheme reconfiguration	
Addition of extra monitoring points	
Addition of extra generators	

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Scheme reconfigurations – small scheme	
Item	Cost (£)
Any other material cost drivers not referred to above (please specify):	
Other (please specify):	
Total	

Scheme reconfigurations – medium scheme	
Item	Cost (£)
Cost of scheme reconfiguration	
Addition of extra monitoring points	
Addition of extra generators	
Any other material cost drivers not referred to above (please specify):	
Other (please specify):	
Total	

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Scheme reconfigurations – large scheme	
Item	Cost (£)
Cost of scheme reconfiguration	
Addition of extra monitoring points	
Addition of extra generators	
Any other material cost drivers not referred to above (please specify):	
Other (please specify):	
Total	

5 ANM system upgrades and new releases

Please provide details of the frequency with which we will need to undertake significant system upgrades and/or deployments of materially changed or new application software releases for the ANM system.

In addition, please provide pricing estimates for such upgrades/new releases using the following headings.

ANM upgrades and new software releases			
	Year 1	Year 2 (if needed)	Total
	Cost (£)	Cost (£)	Cost (£)
Implementation services – upgrades to, or deployments of materially changed or new releases of, core ANM application software:			
• Project management			
• Technical specialists			
• Other (please specify):			
•			
•			
Total			

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6 Distributed Energy Resource Management System (DERMS)

Northern Powergrid will be looking in the future to develop the organisational capability to have a system that has ANM system functionality and DERMS functionality. This could be achieved by either i) integrating the ANM system with a separate DERMS or ii) evolving the ANM system to become a DERMS. These two options are described in sections 6.1 and 6.2 respectively. The bidder is required to describe how their ANM system may develop in the future to either integrate with a DERMS via suitable interfaces or evolve into a DERMS by increasing the functionality of the ANM system to provide DERMS functionality.

6.1 Integration with a DERMS

In this option Northern Powergrid would be looking, in the future, for its enterprise ANM system to integrate with a DERMS providing the capabilities typically associated with such a system including forecasting of the need for NPg flexibility services and dispatching such flexibility services as required.

Please provide, as a separate document any system software development required for the future integration of the enterprise ANM system with a typical DERMS including:

- Changes to the ANM system software; and
- Additional software required to integrate with a DERMS.

Please provide costs for the future integration of the enterprise ANM system with a DERMS.

Integration of enterprise ANM with a DERMS			
	Year 1	Year 2 (if needed)	Total
	Cost (£)	Cost (£)	Cost (£)
Implementation services – upgrades to, or deployments of materially changed or new releases of core ANM application software:			
• Project management			
• Technical specialists			
• Trainers (for user training)			
• Other (please specify):			
•			
Implementation services - integration with a DERMS			
• Project management			
• Technical specialists			
• Other (please specify):			
•			
Implementation services – interface with our DMS/ADMS			
• Project management			
• Technical specialists			
• Other (please specify):			
•			
Software:			
• Initial licence fee			

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• Other (please specify):			
•			
Other (please specify):			
•			
•			
Total			

6.2 Evolution of ANM into DERMS

In this option Northern Powergrid would be looking, in the future, for its enterprise ANM system to evolve over time, into a full DERMS providing the capabilities typically associated with such a system including forecasting of the need for Npg flexibility services and dispatching such flexibility services as required.

Please provide as separate document the key minimum modules/functionalities that will be available in the costed DERMS.

Please provide costs for the evolution of the enterprise ANM system to include DERMS capability.

Expansion of enterprise ANM into a full DERMS			
	Year 1	Year 2 (if needed)	Total
	Cost (£)	Cost (£)	Cost (£)
Implementation services – upgrades to, or deployments of materially changed or new releases of, core ANM application software:			
• Project management			
• Technical specialists			
• Trainers (for user training)			
• Other (please specify):			
•			
Implementation services - interface with our DMS/ADMS			
• Project management			
• Technical specialists			
• Other (please specify):			
•			
Software:			
• Initial licence fee			
• Other (please specify):			
•			

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Other (please specify):			
•			
•			
Total			

Please provide pricing details of ongoing support and maintenance costs for the DERMS using the headings below:

Ongoing Support and Maintenance – for additional modules needed to expand an enterprise ANM into a DERMS					
	Yr1	Yr2	Yr 3	Yr 4	Yr 5
	Cost (£)	Cost (£)	Cost (£)	Cost (£)	Cost (£)
Additional annual software support fee					
Annual 3 rd line support fee (if different from above) on the following bases:					
• A help desk manned by technically competent staff 08:00-18:00 each working day in England, and service-affecting issues resolved within two working days.					
• A help desk manned by technically competent staff 08:00-18:00 each working day in England, and service-affecting issues resolved within four hours.					
• A help desk manned by technically competent staff 08:00-18:00 seven days per week, and service-affecting issues resolved within two working days.					
• A help desk manned by technically competent staff 08:00-18:00 seven days per week, and service-affecting issues resolved within four hours.					
• A help desk manned by technically competent staff around the clock, except Christmas Day, and service-affecting issues resolved within two working days.					
• A help desk manned by technically competent staff around the clock, except Christmas Day, and service-affecting issues resolved within four hours.					
Other (please specify):					
•					

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•								
Total								

Please provide details of the basis on which the recurring annual costs above shall be adjusted to take account of indexation. For example, is it expected that the index to be used shall be as published by the Office for National Statistics in the Consumer Prices Index including owner occupiers' housing costs (CPIH), or will it be an alternative measure.

Please indicate if it is expected that adjustment mechanism will have a cap (maximum increase) and collar (minimum increase) in place.

7 Day rates

Please provide details of day rates that would be applicable for ad-hoc enhancements and engineering activities.

Please provide details of relevant role types for which day rates may apply.