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NPS/003/046 – Technical Specification for Installation, Commissioning and ongoing Maintenance of Online Dissolved Gas Analysers

1. Purpose

This specification details the technical requirements for the installation, maintenance and commissioning of Online dissolved gas analysers.

This document supersedes the following documents, all copies of which should be destroyed:

Document Reference	Document Title	Version	Published Date
NPS/003/046	Technical Specification for Installation, Commissioning and ongoing Maintenance of Online Dissolved Gas Analysers	1.0	October 2024

2. Scope

This specification includes for the installation, commissioning and ongoing maintenance of monitors which are to be installed to various transformers across the Northern Powergrid network. The precise location of these monitors will be supplied after the contract is awarded.

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Technical Requirements

2.2. Compliance with other Specifications and Standards

Technical documents referenced within this specification refer to the latest versions of the relevant International Standards, British Standard Specifications and all relevant Energy Networks Association Technical Specifications (ENA TS) current at the time of supply.

2.3. Technical Specification

2.3.1. Overall

The equipment is to be installed on a range of size and type of transformers. The supplier shall be responsible for the installation, commissioning and ongoing maintenance of the units. The installation shall be carried out on the sites as required. The units shall be able to be installed outside and be rated IP45 so no damage will be caused by been located outdoor, also, a stainless steel or suitably treated enclosure will be required as there may be occasions where the units are installed in a costal location.

3.2.1.1 Unit Technology

The units should provide oil analysis for at least the 4 key gases (Hydrogen, Acetylene, Ethylene and Methane) along with moisture and carbon monoxide. The software which allows the set-up of the units to allow the results to be analysed should be included as part of the initial supply and the unit should be fully commissioned to NPg requirements prior to the engineer leaving site.

The provision for alarm limits to be set by NPg engineers shall be available in order to prevent any nuisance alarms generating and can also be set in order to reflect the normal operating gas levels of the transformers so an early indication of a fault can be identified.

For day-to-day operation, the unit shall be maintenance free the calibration shall be factory set and no further adjustments required after this point. Due to the location of some of the potential substations, the use of a carrier gas or other such consumables are not to be used in the units.

Units may have an option for multi compartment measuring so that both the main tank and separate selector compartment can be monitored in a single unit. Details of this should be provided at the time of tender and options for both single compartment measuring and multi compartment measuring shall be provided.

3.2.1.2 Unit Input and Outputs

Northern Powergrid will install and supply the power cabling to the unit – the cable will be left to be made off and suitably glanded into the unit during commissioning. The supply will be commissioned when the unit is ready to be powered up for commissioning activities.

The units must be capable to transmit the recorded oil sample results via a GPS connection installation – if required suitable IP addresses for the units shall be assigned by NPg. The method of this data transmission will be via e-sim card in order for NPg to change cellular network provider, however, if this technology is not available at the time of the contract placement a physical sim card unit will be accepted on the understanding that a development for e-sim compatibility is in progress and that any installed units will be upgraded at the manufacturers cost when the e-sim technology for the unit becomes available.

All gas concentration data which is transmitted by the unit should be stored on NPg servers and the raw data files should be in an accessible format which can be read and used by standard computer software to enable NPg to use the data for asset health assessments and internal trending of the DGA data.

The unit as well as cabling to enable the volt free contacts and/or a DNP3 connection over RS485 to be wired into the substation SCADA systems where applicable. All hardwired alarm indications will be

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handled by the SCADA systems with integration in the alarm system completed by NPG staff – any multicore cables should be terminated to the required contacts so can be commissioned at a later date.

The unit shall output alarms when the unit requires attention for either a gas warning or gas alarm which will be dependent on the programmed limits stored into the unit. It is expected that the unit will e-mail the local engineers if any of the alarm limits are broken and also if maintenance is required an e-mail shall be sent to the relevant engineers so the relevant maintenance can be programmed – unless it makes the unit unserviceable it shall not prevent the unit from taking the routine samples and not initiate an alarm which may mask any other alarm initiation.

The unit shall be able to be monitored, alarm set points adjusted and data collected by the unit examined and trended by the use of cloud computing initially with no extra software required on the NPg network or server. If after a period of time the addition of software may be considered if this offers an enhanced experience, however, this shall not be required from the initial setup and operation of the units.

3.2.1.3 Maintenance Requirements

Full details of the ongoing maintenance requirements of the unit should be detailed – any maintenance which is required on more frequently than a yearly basis will not be accepted.

The supplier shall have a call out facility so if a unit goes faulty or generates a fault alarm it will be possible for the local engineers to call out an engineer to rectify the fault in a timely manner – all replacement parts shall be provided as part of this contract. Any user changeable parts shall be able to be provided to NPg in order to reduce the downtime of the units as far as is practicable.

It is expected that the engineers who are to be involved in the upkeep of these units will be qualified to access NPg substations and able to hold the correct codes in order to complete the work required.

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3. References

3.1. External Documentation

Reference	Title
n/a	

3.2. Internal Documentation

Reference	Title
n/a	

3.3. Amendments from Previous Version

Reference	Description
3.2.1.1	Added text in relation to multi compartment sampling
Appendix 1	Added row on table to confirm technology type available

4. Definitions

Term	Definition
NPg	Northern Powergrid

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5. Authority for Issue

5.1. 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
Joe McAndrew	Governance Administrator	29/01/2025

5.2. 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	
No	Period: 5 Years	Reason: This spec will be reviewed in line with procurement requirements and after assessment of initial product offering
Should this document be displayed on the Northern Powergrid external website?		Yes
		Date
Paul McAdoo	Lead Policy and Standards Engineer	29/01/2025

5.3. 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
Joe Helm	Lead Policy and Standards Engineer	26/02/2025

5.4. Authorisation

Authorisation is granted for publication of this document.

		Date
Paul Black	Head of System Engineering	07/03/2025

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Appendix 1 – System Characteristics

System Characteristics	Response
Unit Technology	
Gas Detection Technology Utilized in unit	
Number of Compartments available to be sampled	
Unit Inputs and Outputs	
System supply Voltage required	
Alarm Output Options	
Data Transmission options	
Data Analysis medium and software requirements	
Is there an ongoing cost for access to the oil analysis data	
How much data is stored on the units to be accessed	
Is there a limit on the number of users able to use the system	
What is the format the raw data is transmitted from the unit to the server	
The unit can be controlled, adjusted and data monitored via the cloud with no software require for the initial setup and operation	
Maintenance Requirements	
Is there a requirement for an ongoing maintenance contract to meet the units maintenance requirements and what is the expected frequency of these visits	
What is the expected response in the event of a system failure.	
Do you have any trained staff able to access NPg substations or is this something that will be arranged if contract award.	