Level 3 End-Point Assessment - Gas Network Craftsperson – Electrical and Instrumentation

EPA Specification Section 4 – The GNC Standard with Amplification and Guidance

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for end-point assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk

Help Desk telephone: 0121 713 8310

The Gas Network Craftsperson Standard consists of the following core requirements, this applies across all pathways:

- Core Knowledge (6 elements)
- Core Skills (15 elements)
- Core Behaviours (12 elements)

The following pages list each of the core elements of the standard, the assessment method(s) required and additional Amplification and Guidance from EUIAS on the range and depth expected. This applies across all roles.

Core Knowledge
Assessed in Knowledge and Skills Assessment
CK2 The requirements of the **Gas Safety (Management) Regulations** as relevant to their role, this being supported through company specific procedures involved in the practical installation and maintenance of gas network assets. **CK3** The requirements of **Health and safety standards and regulations, and environmental and regulatory requirements**, including; The Health and Safety at Work Act Dangerous Substances Explosive Atmospheres Regulations, The ATEX Directives, The Management of Health and Safety regulations, PUWER, Working at Height Regulations, Confined spaces Regulations, COSHH, PPE Regulations, RIDDOR, Noise at work regulations, Control of Asbestos regulations and the Manual Handling Operations Regulations. **CK5 Gas engineering and mechanical or electric principles and processes** that underpin the location, diagnosis and rectification of faults
Core Knowledge
Assessed in the Technical Interview underpinned by logbook Part 2 – Focussing on the on-programme evidence in the logbook

CK1 Company testing, and commissioning procedures needed to establish the condition of gas assets, equipment, network infrastructure and the **actions needed as a result of the tests**. This includes both practical applications and the use of diagnostic techniques and IT systems.

CK4 Company **maintenance practices, processes and procedures** associated with gas network systems, controls and equipment

CK6 Company policies, procedures and engineering instructions as specified by the employer

Core Knowledge

Amplification and Guidance

CK1: Company testing, and commissioning procedures needed to establish the condition of gas assets, equipment, network infrastructure and the **actions needed as a result of the tests**. This includes both practical applications and the use of diagnostic techniques and IT systems.

- State the procedures to be followed
- Explain the purpose of testing
- Describe the diagnostic techniques which may be employed
- Explain how to interpret test results and the actions to take
- Describe the impact of malfunction or failure

CK2: The requirements of the **Gas Safety (Management) Regulations** as relevant to their role, this being supported through company specific procedures involved in the **practical installation** and **maintenance** of gas network assets.

- Explain the purpose, relevance, and application of GSMR
- Describe how this is supported through company specific procedures

CK3: The requirements of **Health and safety standards and regulations, and environmental and regulatory requirements,** including; The Health and Safety at Work Act Dangerous Substances Explosive Atmospheres Regulations, The ATEX Directives, The Management of Health and Safety

regulations, PUWER, Working at Height Regulations, Confined spaces Regulations, COSHH, PPE Regulations, RIDDOR, Noise at work regulations, Control of Asbestos regulations and the Manual Handling Operations Regulations.

- Demonstrate an understanding of the stipulated health and safety legislation and regulations
- Explain the application of the stipulated health and safety legislation and regulations for the safety of yourself, colleagues and others

CK4: Company **maintenance practices, processes and procedures** associated with gas network systems, controls and equipment

- Explain the importance of following procedures
- Demonstrate specific knowledge of key procedures

CK5: Gas engineering and mechanical or electric principles and processes that underpin the location, diagnosis, and rectification of faults

- Explain basic engineering theories, including the effects of pressure, temperature and volume
- Explain the application of theory to the way in which equipment functions
- Describe the application of theory to identify and rectify faults

CK6: Company policies, procedures and engineering instructions as specified by the employer

- Explain the difference between policies, procedures, and engineering instructions
- State the range and purpose of Company policies, procedures, and engineering instructions
- Explain the importance of following policies, procedures, and engineering instructions
- Demonstrate specific knowledge of key Company policies, procedures, and engineering instructions

Core Skills

Assessed in the Knowledge and Skills Assessment

CS12 Through risk assessment, minimise risks to life, property and the environment when undertaking work activities

Core Skills

Assessed in the Technical Interview underpinned by logbook
Part 1 – Focussing on the practical task evidence in the logbook

CS1 Undertake and document risk assessments in accordance with company procedures

CS2 Comply with workplace health, safety & environmental practices and regulations, maintaining a safe and secure working environment

CS3 Follow engineering instructions and company procedures to complete tasks safely and on-time

CS4 Undertake inspection and examination of network assets in order to maintain the safe and compliant operation of the network to ensure the integrity, safety and security of supply

CS5 Maintain and/or install gas engineering assets, components and associated equipment

CS6 Install, test, purge and commission gas network assets

CS7 Operate powered tools and equipment, such as drills, angle grinders, brush cutters and shot blasting equipment as required for network maintenance operations

CS8 Use approved gas detection equipment to ensure safe environment

CS9 Use Personal Protective Equipment (PPE) and safety equipment in accordance with manufacturer's instructions and employer policy

CS10 Obtain and analyse asset condition and performance information to facilitate decision making

CS11 Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact

CS13 Accurately record job information, complete job reports and process

Assessed in the Technical Interview underpinned by logbook
Part 2 – Focussing on the on-programme evidence in the logbook

CS1 Undertake and document risk assessments in accordance with company procedures

CS2 Comply with workplace health, safety & environmental practices and regulations, maintaining a safe and secure working environment

CS3 Follow engineering instructions and company procedures to complete tasks safely and on-time

CS14 Liaise with gas consumers, statutory agencies and members of the public in order to ensure their safety

CS15 Accurately update company systems with details of work undertaken

Core Skills

Amplification and Guidance

CS1: Undertake and document **risk assessments** in accordance with company procedures

- Demonstrate knowledge of risk assessment processes
- Correctly identify hazards and risks
- Correctly identify and implement mitigation actions
- Correctly use documentation

CS2: Comply with **workplace health, safety & environmental practices and regulations**, maintaining a safe and secure working environment

- Correctly identify stakeholders who need to be informed of work being undertaken
- Demonstrate understanding and application of safe working practices
- Establish and maintain a safe work area/site

CS3: Follow **engineering instructions and company procedures** to complete tasks safely and on-time

- Demonstrate understanding and application of relevant procedures for the task

CS4: Undertake **inspection and examination of network assets** in order to maintain the safe and **compliant operation of the network** to ensure the integrity, safety and security of supply

- Correctly apply procedures whilst undertaking work
- Demonstrate the maintenance of network assets to ensure the safety and security of supply
- Demonstrate the correct use of tools and testing equipment

CS5: Maintain and or install **gas engineering** assets, components, and associated equipment

- Correctly install or maintain equipment, including pipework, meters, and pressure regulators
- Demonstrate the correct and safe use of tools and equipment

CS6: Install, test, purge and commission gas network assets

- Correctly install or maintain equipment, including meters and regulators
- Correctly apply tightness and functional test procedures
- Demonstrate the correct application of purge and commissioning procedures

CS7: Operate **powered tools and equipment**, such as drills, angle grinders, brush cutters and shot blasting equipment as required for network maintenance operations.

- Demonstrate the correct and safe use of powered tools and equipment

CS8: Use **approved gas detection equipment** to ensure safe environment

- Demonstrate the correct use of gas detection equipment
- Correctly interpret outputs where gas readings are detected
- Demonstrate the implementation of appropriate actions

CS9: Use **Personal Protective Equipment (PPE)** and **safety equipment** in accordance with manufacturer's instructions and employer policy

- Demonstrate the correct wearing and use of PPE and safety equipment

CS10: Obtain and analyse **asset condition** and **performance information** to facilitate decision making

- Correctly assess the condition and performance of equipment
- Correctly interpret results and take appropriate actions

CS11: **Identify, organise and use resources effectively** to complete tasks, with consideration for cost, quality, safety, security and environmental impact

- Correctly identify the tools and equipment required
- Correctly identify the materials required
- Demonstrate appropriate safe working practices
- Demonstrate the application of site security requirements
- Demonstrate actions taken to care for the environment, including waste disposal
- Demonstrate awareness of costs
- Demonstrate task completion of an appropriate quality

CS12: Through **risk assessment, minimise risks to life, property and the environment** when undertaking work activities

- Demonstrate the application of risk assessment processes and application of company specific procedures
- Correctly identify hazards and risks
- Correctly identify and implement appropriate safety actions
- Correctly use documentation and record findings on site

CS13: Accurately record **job information, complete job reports and process**

- Demonstrate the use of company specific documentation, reporting systems and processes
- Demonstrate the appropriate and accurate completion of documentation before, during and after work

CS14: Liaise with **gas consumers, statutory agencies** and **members of the public** in order to ensure their safety

- Correctly identify stakeholders who need to be informed of work being undertaken
- Demonstrate understanding of the importance of effective liaison with others

CS15: Accurately update **company systems** with details of work undertaken

- Demonstrate the use of company specific systems and records
- Demonstrate the updating of company systems and records

Core Behaviours

Assessed in the technical interview underpinned by logbook
Part 1 – Focussing on the practical task evidence in the logbook

CB1 Display a self-disciplined, self-motivated approach

CB3 Demonstrate and apply a safety-first approach

CB4 Accept accountability when undertaking individual and team tasks

CB5 Follows instruction from appropriate supervision, and makes decisions when required

CB6 Quality-focussed and professional in work and in personal standards

CB8 Accepts responsibility for work undertaken

Assessed in the technical interview underpinned by logbook
Part 2 – Focussing on the on-programme evidence in the logbook

CB2 Deliver a polite, courteous professional service to all customers, stakeholders and members of the public as appropriate

CB4 Accept accountability when undertaking individual and team tasks

CB7 Recognise personal limitations and seek advice from managers, experts and specialists when required

CB9 Receptive to the needs and concerns of others, especially where related to diversity and equality

CB10 Committed to carrying out and recording Continued Professional Development necessary to maintain and enhance competence

CB11 Exercises responsibilities in an ethical manner

CB12 Interacts with people and approaches work activities in a way that contributes to continuous self-improvement

Core Behaviours

Amplification and Guidance

CB1: Display a **self-disciplined, self-motivated** approach
- Demonstrate ownership of and responsibility for own actions

CB2: Deliver a **polite, courteous professional service** to all customers, stakeholders and members of the public as appropriate
- Demonstrate understanding of company expectations and how to represent oneself in a polite and professional manner

CB3: Demonstrate and apply a **safety-first approach**
- Demonstrate an understanding of health and safety issues
- Demonstrate concern for safety for oneself, colleagues and others

CB4: Accept **accountability** when undertaking individual and team tasks
- Demonstrate ownership of work undertaken by oneself

CB5: Follows instruction from appropriate supervision and **makes decisions** when required.
- Recognise and accept levels of authority
- Act upon instructions received
- Make and take responsibility for own decisions

CB6: Quality-focussed and **professional in work and in personal standards**
- Recognise the need to act in a professional manner
- Produce work to a required standard and in compliance with policies and procedures

CB7: Recognise **personal limitations** and **seek advice** from managers, experts and specialists when required
- Recognise and accepts levels of authority
- Recognise own level of authority, including limitations
- Willing to seek guidance

CB8: Accepts **responsibility** for work undertaken
- Demonstrate ownership of work undertaken by oneself

CB9: Receptive to the **needs and concerns of others**, especially where related to diversity and equality

- Demonstrate awareness of the needs of others with relation to equality and diversity
- Provides examples of being receptive to the needs of others in relation to equality and diversity

CB10: Committed to carrying out and recording **Continued Professional Development** necessary to maintain and enhance competence

- Understand the need to develop and maintain competence to undertake work activities
- Recognise the requirements and benefits of Continued Professional Development (CPD)
- Provides examples of maintaining CPD

CB11: Exercises responsibilities in an **ethical manner**

- Understands, recognises and applies the requirements for ethical behaviour

CB12: Interacts with people and approaches work activities in a way that contributes to **continuous self-improvement**

- Demonstrate commitment to self-development

Electrical and Instrumentation pathway

In addition to the Core Knowledge, Skills and Behaviours the Electrical and Instrumentation pathway also contains:

- Specific Skills - 15 elements
- Specific Knowledge - 10 elements

The following list each of the elements of the electrical and instrumentation pathway providing amplification and guidance on the range and depth expected this is then followed by the assessment method(s) used per element.

Specific Skills Electrical and Instrumentation

Assessed in the Technical Interview underpinned by the logbook
Part 1 – Focussing on the practical task evidence

NMCEi1 Apply **electrical theories and principles** and use equipment to carry out **diagnostic fault-finding** procedures

NMCEi2 Inspect, maintain, repair, overhaul test and **calibrate instrumentation** and **control equipment** and **circuits** in accordance with **company procedures**

NMCEi4 Carry out **cable testing** across a range of voltages to ensure safety and suitability for use

NMCEi5 Install, maintain and dismantle instruments, controllers, probes, attachments, cabling, meters and display units

NMCEi9 Repair, maintain, configure and calibrate field instrumentation, communication devices and associated equipment used in system and process control

NMCEi12 Carry out isolation procedures to ensure process or system stability and the safety of personnel when carrying out operations

NMCEi15 Apply electrical skills to install, maintain and dismantle a wide range of plant, machinery and components

Specific Skills Electrical and Instrumentation

Assessed in the Technical Interview underpinned by the logbook
Part 2 – Focussing on the on-programme evidence

NMCEi3 Maintain **site lighting** and **fixed and portable equipment** which may include generators, batteries and associated equipment

NMCEi6 Configure telemetry outstation and internal systems

NMCEi7 Identify and resolve data quality and calibration issues

NMCEi8 Test, calibrate and validate fixed and portable analogue and digital instrumentation

NMCEi10 Use standards and specifications to improve the information gathered by telemetry data

NMCEi11 Inspect and maintain security equipment, telecommunication devices and alarm systems

NMCEi13 Provide support to day-to-day users of instrumentation and control systems

NMCEi14 Ensure consistent and valid data is available for business and regulation purposes

NMCEi17: The permitry requirements when maintaining or configuring telemetry systems or undertaking works that may initiate system alarms

NMCEi18: Recognise the processes to be followed in order to identify and resolve data quality and calibration issues

NMCEi19: Understand how to test and calibrate instrumentation and control equipment in accordance with company-specific procedures

NMCEi20: The theories used to maintain, test and calibrate electrical equipment in line with company specific procedures

NMCEi22: Identify relevant, company specific procedures, and know how to access such documentation

Specific Skills Electrical and Instrumentation

Amplification and guidance

Assessed in the Technical Interview underpinned by the logbook

Part 1 – Focussing on the practical task evidence

NMCEi1 Apply **electrical theories and principles** and use equipment to carry out **diagnostic fault-finding** procedures

- Demonstration of applying the theories of diagnostics and fault identification and rectification
- Correct application of appropriate fault-finding procedures

NMCEi2 Inspect, maintain, repair, overhaul test and **calibrate instrumentation** and **control equipment** and **circuits** in accordance with **company procedures**

- Demonstrate use of relevant company procedures

- Correctly apply relevant procedures when carrying out work
- Undertake work to the required outcome and quality
- Demonstrate the correct selection and use of materials, tools and equipment
- Demonstrate safe working practices, including appropriate use of PPE

NMCEi4 Carry out **cable testing** across a range of voltages to ensure safety and suitability for use

- Demonstrate taking measures to avoid the risks associated with electrical voltages
- Demonstrate the use of cable testing equipment
- Demonstrate the selection of appropriate cables and confirm their suitability for use

NMCEi5 Install, maintain and dismantle instruments, controllers, probes, attachments, cabling, meters and display units

- Demonstrate the use and application of relevant company procedures
- Demonstrate how the installation and maintenance of a variety of electrical and instrumentation equipment
- Undertake work to the required outcome and quality
- Demonstrate the correct selection and use of materials, tools and equipment
- Demonstrate safe working practices, including the appropriate use of PPE

NMCEi9 Repair, maintain, configure and calibrate field instrumentation, communication devices and associated equipment used in system and process control

- Demonstrate the application of relevant procedures
- Demonstrate the maintenance and calibration of communication systems such as alarms
- Undertake work to the required outcome and quality
- Demonstrate the correct selection and use of materials, tools and equipment
- Demonstrate safe working practices, including appropriate use of PPE

NMCEi12 Carry out isolation procedures to ensure process or system stability and the safety of personnel when carrying out operations

- Demonstrate the process to be followed for safe isolation and system stability and the factors impacting this
- Correctly apply relevant procedures when carrying out work

NMCEi15 Apply electrical skills to install, maintain and dismantle a wide range of plant, machinery and components

- Demonstrate the application of electrical theory
- Demonstrate application of relevant procedures and permits to work
- Demonstrate the installation, maintenance and decommissioning of electrical and instrumentation equipment
- Undertake work to the required outcome and quality
- Demonstrate the correct selection and use of materials, tools and equipment

- Demonstrate safe working practices, including appropriate use of PPE

Amplification and guidance

Assessed in the Technical Interview underpinned by the logbook
Part 2 – Focussing on the on-programme evidence

NMCEi3 Maintain **site lighting** and **fixed and portable equipment** which may include generators, batteries and associated equipment
- Demonstrate the application of maintaining site lighting, and other portable equipment
- Use test and calibration equipment required for the task
- Demonstrate the measures to be taken to ensure equipment is suitable and safe for use

NMCEi6 Configure telemetry outstation and internal systems
- Demonstrate the use and application of relevant procedures
- Demonstrate the operation and configuration of telemetered systems
- Undertake work to the required outcome and quality
- Demonstrate the correct selection and use of materials, tools and test equipment
- Demonstrate safe working practices, including the appropriate use of PPE

NMCEi7 Identify and resolve data quality and calibration issues
- Demonstrate the use and application of data quality systems, their limitations and implications and how to correct errors
- Demonstrate confirming the accurate calibration of equipment identifying the potential implications of this being incorrect

NMCEi8 Test, calibrate and validate fixed and portable analogue and digital instrumentation
- Demonstrate the application of relevant company procedures
- Demonstrate the testing, calibration and validation of instrumentation

NMCEi10 Use standards and specifications to improve the information gathered by telemetry data
- Demonstrate the application of relevant standards and specifications

NMCEi11 Inspect and maintain security equipment, telecommunication devices and alarm systems
- Demonstrate the inspection and confirmation of operation of site security systems
- Demonstrate the inspection and confirmation of operation of telecommunication and alarm systems

- Correctly apply relevant procedures when carrying out work

NMCEi13 Provide support to day-to-day users of instrumentation and control systems
- Demonstrate the support that may be needed by others
- Give examples of data transfer to other users and control operators

NMCEi14 Ensure consistent and valid data is available for business and regulation purposes
- Demonstrate the capture of valid data
- Demonstrate how to review, update or amend previous data capture

NMCEi17: The permitry requirements when maintaining or configuring telemetry systems or undertaking works that may initiate system alarms
- Explain the purpose and use of alarms on telemetry systems
- Explain the types and purpose of permits
- Explain the importance of complying with permits
- State the actions to take if unable to comply with permit requirements

NMCEi18: Recognise the processes to be followed in order to identify and resolve data quality and calibration issues
- Describe types of data quality issues, potential reasons/causes and potential implications
- Describe types of calibrations issues, potential reasons/causes and potential implications
- Explain how to identify and resolve issues associated with data quality and calibration

NMCEi19: Understand how to test and calibrate instrumentation and control equipment in accordance with company-specific procedures
- State and explain relevant company procedures for testing and calibration
- Identify and describe the types of instrumentation and equipment that requires calibration
- Describe the calibration procedures for different types of instrumentation and equipment
- Describe the potential implications of incorrect calibration

NMCEi20: The theories used to maintain, test and calibrate electrical equipment in line with company specific procedures
- State and explain relevant company procedures for testing and calibration
- Explain theories relevant to the calibration of different types of electrical equipment

NMCEi22: Identify relevant, company specific procedures, and know how to access such documentation
- State key company procedures for E&I work and their scope
- Explain where company procedures are held and how they are accessed

Specific Knowledge Electrical and Instrumentation
Assessed in the Knowledge and Skills Assessment
NMCEi16: The safety processes to be applied when testing for voltages across the range likely to be encountered **NMCEi21**: Understand how to safely apply diagnostic fault-finding principles to electrical systems **NMCEi23:** Legislative requirements affecting electrical works and be able to describe how such legislation may affect them **NMCEi24:** The hazards that could be encountered when maintaining both fixed and portable electrical equipment **NMCEi25:** Understand why safe isolation procedures must be followed when carrying out electrical or instrumentation operations
Specific Knowledge Electrical and Instrumentation
Amplification and guidance Assessed in the Knowledge and Skills Assessment
NMCEi16: The safety processes to be applied when testing for voltages across the range likely to be encountered • Explain the voltages associated with types of work and equipment • Describe the safety measures to be adopted • Explain the regulations and procedures applicable to electrical work **NMCEi21**: Understand how to safely apply diagnostic fault-finding principles to electrical systems • Explain the purpose of components, how they work and the interaction between various components • Describe the common failure or fault modes of components • Describe approaches to be taken to identify faults on various types of equipment • Describe the interpretation of test results to identify and resolve faults

NMCEi23: Legislative requirements affecting electrical works and be able to describe how such legislation may affect them

- State legislation and regulations applicable to electrical work and their scope
- Explain the appropriate application of legislation

NMCEi24: The hazards that could be encountered when maintaining both fixed and portable electrical equipment

- Explain the potential hazards of electrical equipment and their implications
- Describe measures to mitigate hazards

NMCEi25: Understand why safe isolation procedures must be followed when carrying out electrical or instrumentation operations

- Explain the reasons and requirements for safe isolation
- Describe safe isolation procedures
- Demonstrate the application of electrical theory
- Demonstrate application of relevant procedures and permits to work