# LEVEL 2 NVQ DIPLOMA IN RADIATION PROTECTION

## Centre Qualification Handbook

### Competence-based Qualifications

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## INTRODUCTION TO THE HANDBOOK

This qualification sits within the Regulated Qualifications Framework (RQF).

This Qualification Handbook has been developed to ensure that PAA\VQ-SET Centres understand the requirements of the qualification. The Handbook contains the following information:

- Qualification Structure
- Assessment Requirements
- Assessment Methods
- Glossary
- Qualification Units

This Qualification Handbook has been developed to provide support in the implementation of the qualification as well as giving information to ensure that the assessment and quality assurance is consistent, robust and reliable within each centre and nationally. The handbook also contains details of the skills and/or knowledge the learner must obtain to achieve the units and qualification.

Qualification Structure

This section of the handbook summarises the content of the qualification and the skills and/or knowledge learners that achieve it can be expected to gain. It also outlines the units required to achieve the qualification and will give the learner an idea of how long the qualification will take to achieve through the Total Qualification Time (TQT) and how much contact time they can expect through the Guided Learning Hours (GLH). It also provides information about possible progression opportunities once the qualification has been achieved.

Assessment Requirements

The assessment requirements for the qualification will cover any specific information about how the qualification may be assessed, such as whether assessors require specific qualifications or occupational competence and whether simulation is permitted in the achievement process.

Assessment Methods

This section summarises the different assessment methods and types of evidence that support assessment; these may be used to demonstrate competence or the achievement of knowledge and understanding.

Qualification Units

The unit overview summarises the content of the unit and the skills and/or knowledge the learner will have gained on achievement of the unit. The units may also contain additional information in the assessment context which will describe the areas to be covered and any appropriate assessment guidance and evidence requirements which will outline additional assessment requirements and should be built into assessment plans and included on assessment records. The unit detail will also confirm whether simulation is permitted for that particular unit.

### Qualification Assessment and Support Materials

Centres will be sent the following qualification assessment and support materials:

- Assessment Forms – it is not mandatory to use these forms. Centres may wish to use their own assessment documentation – these should be approved by the External Verifier prior to use.
- Learner Guide
- Qualification Handbook
- Registration Spreadsheet & Certification Claim Forms

# LEVEL 2 NVQ DIPLOMA IN RADIATION PROTECTION

## Qualification Summary

This Diploma is based on the Cogent SSC National Occupational Standards (NOS) for Radiation Protection and will provide recognition of the skills and knowledge of individuals working in radioactive environments. The qualification is aimed at learners who may be technical staff but may also be employed in a wide range of support roles.

## Total Qualification Time (TQT) and Guided Learning Hours (GLH)

### Guided Learning Hours (GLH)

Guided Learning Hours are the time the learner is under the immediate supervision or guidance of a lecturer, supervisor, tutor or other appropriate provider or education or training.

The GLH for this qualification is 162

### Total Qualification Time (TQT)

Total Qualification Time is comprised of 2 elements:

1. GLH
   plus
2. an estimate of the number of hours a learner will reasonably be likely to spend in preparation, study or any other form of participation in education or training, including assessment, which takes place as directed by (but not under the immediate supervision of) a lecturer, supervisor, tutor or other appropriate provider or education or training

The TQT for this qualification is 380

## Achieving the Qualification

**14 Units must be achieved (7 knowledge units and 7 competence units).**

Mandatory Units: All 12 Mandatory Units must be achieved.

Optional Units: Learners must achieve 2 Optional Units from one Option Group. Knowledge and competence units must be taken in combination i.e. if unit N231k is chosen, unit N231c must also be completed; and vice-versa.

### *Mandatory Units*

| Unit No. | Unit Name | Credit Value |
|---|---|---|
| N225k | How to Respond to Radiation Incidents Within Ionising Radiation Environments | 4 |
| N225c | Respond to Radiation Incidents Within Ionising Radiation Environments | 3 |
| N226k | How to Monitor Radiation Hazards Within Ionising Radiation Environments | 3 |
| N226c | Monitor Radiation Hazards Within Ionising Radiation Environments | 3 |
| N227k | How to Monitor Radiation Conditions During Work Activities Within Ionising Radiation Environments | 3 |
| N227c | Monitor Radiation Conditions During Work Activities Within Ionising Radiation Environments | 2 |

| | | |
|---|---|---|
| N228k | How to Monitor People During Radiation-Related Work Activities Within Ionising Radiation Environments | 2 |
| N228c | Monitor People During Radiation-Related Work Activities Within Ionising Radiation Environments | 2 |
| N229k | How to Monitor Environmental Conditions During Radiation-Related Work Activities Within Ionising Radiation Environments | 3 |
| N229c | Monitor Environmental Conditions During Radiation-Related Work Activities Within Ionising Radiation Environments | 3 |
| N230k | How to Test the Functioning of Radiation Protection Equipment Within Ionising Radiation Environments | 3 |
| N230c | Test the Functioning of Radiation Protection Equipment Within Ionising Radiation Environments | 3 |

***Optional Units***

**Group N231 – if this Group is chosen both Units must be completed**

| Unit No. | Unit Name | Credit Value |
|---|---|---|
| N231k | How to Undertake Radiation-Related Work Activities Within Ionising Radiation Environments | 2 |
| N231c | Undertake Radiation-Related Work Activities Within Ionising Radiation Environments | 2 |

**Group N232 – if this Group is chosen both Units must be completed**

| Unit No. | Unit Name | Credit Value |
|---|---|---|
| N232k | How to Record Information on Radiation Protection Within Ionising Radiation Environments | 2 |
| N232c | Record Information on Radiation Protection Within Ionising Radiation Environments | 2 |

**Progression**

This Diploma is part of a suite of qualifications developed from the Radiation Protection National Occupational Standards (NOS) at Levels 2 to 3.

Further information can be found on the PAA\VQ-SET website www.paa-uk.org or on the Register of Regulated Qualifications website http://register.ofqual.gov.uk

## ASSESSMENT REQUIREMENTS

Assessors must ensure that, when assessing the skills, knowledge and/or understanding, the evidence produced by learners is:

- Valid – does evidence meet the requirements described in the unit?
- Authentic – has the learner produced the evidence?
- Current – has the evidence been produced recently and does it demonstrate current competence?
- Sufficient – is there enough evidence to demonstrate competence?

to enable reliable and consistent judgements to be made about the achievement of all the requirements of the unit(s) and qualification.

PAA\VQ-SET Centres must ensure that people involved in the assessment process have the appropriate expertise and are adequately informed and supported to fulfil their responsibilities.

### ASSESSMENT STRATEGY

Below is the information to support the assessment requirements of the qualification:

- Mandatory use of evidence from workplace performance
- Use of Simulation
- Occupational competence of assessors and verifiers

***Mandatory use of evidence from workplace performance***

a. Unless the use of simulation is expressly permitted within the qualification or unit specific evidence requirements, evidence must demonstrate the learner's competence in a real or realistic environment.

b. Knowledge and Understanding will be assessed via (pre-set and/or free form) questions, or by inference from performance, which cover three primary types of knowledge:

- Knowledge of facts and procedures
- Understanding of principles, concepts and underpinning procedures
- How to apply principles and procedures in specific contexts

All questions must be asked by the assessor at appropriate moments throughout the assessment process, preferably linked to observed activity and/or review of documentary evidence. The questions asked of, and answers provided by, the learner must be recorded.

***Use of Simulation***

c. The qualification or unit specific assessment requirements will define where evidence from simulation is acceptable, and in which contexts.

Simulation should be used only where direct evidence of learner performance cannot be obtained. Under these circumstances simulation may be used for summative assessment. Reasons for the use of simulation should be made clear to and agreed by the external verifier and should include the following details:

- which competence (and standards) the simulation was designed to assess;
- the kind of equipment, facilities and physical environment proposed for the simulation of performance. It is unlikely that the External Verifier will approve a simulation if it does not involve real plant and equipment;
- how the simulated activity relates to the learner's normal work context in terms of the pressures of time, access to resources and access to information, and the communication media; and

- how the simulation was set up and conducted, preferably supported by physical evidence such as photographs or inspection of a test rig.

  Assessors, internal verifiers and external verifiers should monitor the proportion of evidence generated via simulations to ensure that it is not the primary source of a learner's claim to competence.

d. Under these circumstances simulations are reserved for aspects of competence illustrated by the following contexts:

   a. where demonstration of emergency shutdown and related safety procedures would be; **dangerous and/or disruptive** to plant/environment/individuals; **too costly** such as total plant shutdown or dealing with spillage of dangerous substances; where **issues of confidentiality** restrict access to real work opportunities;
   b. demonstrating specific aspects of the operation which rarely or never occur due to effective quality assurance systems;
   c. the capacity to integrate disparate knowledge to cope with unforeseen events and to solve problems; or
   d. aspects of working relationships and communications for which no opportunity has presented for the use of naturally occurring workplace evidence of learner performance.

e. Simulation must enable the individual to demonstrate competence in a real or realistic work environment. In this context this means in specialist centres which replicate the workplace in terms of equipment and environment, reflect normal working situations and use relevant industrial or commercial standards and procedures. Short work placements or non-realistic work environments which do not replicate the pressures and requirements of normal commercial or industrial activities will not be acceptable. The bulk of the learner's evidence should be drawn from their normal working activity and not consist of artificially contrived opportunities for one-off demonstration of competence. Similarly equipment must be that used in current commercial and industrial contexts. Procedures and standards used should be those which are nationally or internationally recognised or devised by specific companies as standard operating procedure.

f. Simulation must enable the individual to acquire his/her skills and knowledge in a realistic work environment. In this context this means in specialist centres which replicate the workplace in terms of equipment and environment, it reflects normal working situations and uses relevant industrial or commercial standards and procedures. Where possible providers should attempt to replicate the pressures and requirements of normal commercial or industrial activities. Equipment must be that used in current commercial and industrial contexts. Procedures and standards used should be those which are nationally or internationally recognised or devised by specific companies as standard operating procedure.

g. Circumstances outside of those listed in Section D above may also be considered suitable for the use of simulation with the agreement of the External Verifier and PAA\VQ-SET. Under these circumstances simulation may be used for formative assessment only.

***Occupational competence of Assessor and Verifiers***

h. Assessors:

   - must be competent in the units they are assessing. This is shown through the assessor having achieved the award they are assessing OR providing quality evidence to the external verifier that they are able to make valid judgements of the competence of learners. This could be done through a combination of a) personal interview, b) review of employment histories and/or c) examination of the assessor's judgement during assessments.
   - must have a working knowledge of awards and a full understanding of that part of the award for which they have responsibility.
   - should hold or be working towards suitable qualifications for assessment, as defined by PAA\VQ-SET.

i. Internal verifiers:

- must be either working in the appropriate sector itself OR they must be able to demonstrate they possess practical and up-to-date knowledge of current working practices appropriate to the sector in which they are carrying out verification practices; and
- must be appointed by a PAA\VQ-SET recognised centre
- must have a working knowledge of the awards they are internally verifying
- should hold or be working towards suitable qualifications for verification, as defined by PAA\VQ-SET.

**ASSESSMENT METHODS AND TYPES OF EVIDENCE**

The following section gives information on the different assessment methods/types of evidence that support assessment. The following assessment methods/types of evidence may be used to demonstrate competence or that the learner has achieved the required level of knowledge and understanding.

### *Observation of Performance*

Observation allows the assessor to see learners carrying out their work activities. It will take place primarily in the workplace but can also be undertaken in a training scheme. Natural discussion should take place where possible during observation, allowing the assessor to ask questions relating to what they are observing at the time. Assessors must capture their observations either by a written report and/or other methods (e.g. video, audio recording).

### *Questioning*

This method of assessment can be used to ensure that the learner has knowledge and understanding to support their skills. Questions can be used to check knowledge - these questions can either be verbal during or at the end of an observation, or they can be set in a written format in formal or informal conditions. As some units may focus entirely on learners' knowledge, assessors may encourage a variety of evidence to meet the requirements of the unit – use of verbal and/or written questions, learner statements and professional discussion (see below). Verbal questioning or professional discussion should be captured, either by written notes or audio recording.

### *Products*

Work product evidence may be generated as a result of work activities undertaken by learners, and could include reports, letters, or records of work carried out.

### *Witness Statement or Testimony*

A Witness Statement or Testimony is confirmation by others that the learner carried out an activity or series of activities relevant to the requirements of the unit. It could be written by the learner and signed by the witness to confirm that it did take place, or the witness may write the statement. Alternatively, the assessor could speak to the witness and record the discussion. The statement can then be used as evidence within an assessment.

There may be occasions when an Expert Witness may be required to contribute to the assessment process. PAA\VQ-SET's definition of an Expert Witness is 'an experienced employee who works in partnership with the assessor, by observing the learner carrying out their duties and recording their observations in line with the assessment procedures'. It should be noted that while the Expert Witness makes a valued contribution to the assessment process, it is the assessor who makes the assessment decision.

### *Simulation*

Simulations are a source of performance evidence showing how an activity is carried out. Simulations require careful planning to ensure that they reflect as near as possible "real life" conditions and the requirements of the qualification(s). As a result of this the costs to set up a simulation may be considerable. Simulations are likely to be used in the following situations:

- they occur infrequently (e.g. dealing with emergencies)
- they involve unusual working conditions (e.g. working in isolation, outside the workplace)
- the work is hazardous
- it is not cost effective

Any use of simulation should be discussed and agreed with the PAA\VQ-SET External Verifier and approved prior to implementation.

***Recognition of Prior Learning (RPL)***

This is the process whereby credit is given to experienced individuals for their previous achievements. It requires careful mapping of the individual's experience to the unit(s) to ensure that it meets the requirements. This exercise must be referred to the External Verifier to ensure that all the evidence presented is acceptable.

***Professional Discussion***

A Professional Discussion gives the learner the opportunity to tell their assessor what they are doing and why they are doing it in a particular way. The discussion should be supported by appropriate evidence – an observation report, work product or witness testimony. Professional Discussions should be planned to give the learner the chance to prepare, and should be recorded.

***Learner Statements***

A Learner Statement is an account of an activity that took place, described by the learner. A detailed statement could demonstrate skill, and also provides evidence of knowledge and understanding. Learner statements should be authenticated by an appropriate person.

***Photographs and use of other media***

Photographs and use of other media, e.g. video and audio, can provide detail of work activities carried out and questioning. Photographs are more effective when used with supporting statements. Video and audio evidence should be effectively referenced to allow specific activities or questioning to be found easily. It is important to note that if photographs and other media are to be used, the learner and assessor should ensure that permission is gained from all people who may be involved.

## GLOSSARY

| Term | Definition |
|---|---|
| **Access Arrangements** | Arrangements that are approved in advance of an examination or assessment to allow achievement to be demonstrated by learners with a disability, special learning needs (including where the learner's first language is not English, Welsh or Irish) or to avoid unlawful discrimination |
| **Appeal** | The process through which an awarding organisation may be challenged on the outcome of an enquiry about results or, where appropriate, other procedural decisions affecting a centre or an individual learner |
| **Assessment** | The process of making judgements about the extent to which a learner's work meets the requirements of a unit, or any additional assessment requirements of a qualification |
| **Assessor** | A person who assesses a learner's work |
| **Award of Qualifications** | A certificate (electronic or paper-based) issued to an individual that recognises their achievement |
| **Award** | A qualification with a TQT value between 10 and 129 |
| **Awarding Organisation** | A body recognised by the qualifications regulators to award qualifications |
| **Centre** | An organisation accountable to an awarding organisation for assessment arrangements leading to the award of qualifications |
| **Centre Recognition** | A process through which a centre wishing to offer an award or awards is confirmed as being able to maintain the required quality and consistency of assessment, and comply with other requirements of the awarding organisation |
| **Certificate (1) for a Unit or Qualification** | A record of attainment of a qualification issued by an awarding organisation |
| **Certificate (2)** | A qualification with a TQT value between 130 and 369 |
| **Credit** | An award that may be made to a learner in recognition of the achievement of a unit or qualification |
| **Credit Value** | The number of credits that may be awarded to a learner for the successful achievement of a unit or qualification |
| **Diploma** | A qualification with a TQT value of 370 or above |
| **Guided Learning Hours** | The number of hours of teacher-supervised or directed study time required to teach a qualification or unit of a qualification |
| **Learning Time** | The amount of time a learner at the level of the unit is expected to take, on average, to complete the unit to the standard required |
| **Level** | An indication of the relative demand, complexity and/or depth of achievement, and/or the autonomy of the learner in demonstrating that achievement |

| Term | Definition |
|---|---|
| **Mandatory Units** | Units that must be achieved for the qualification to be awarded |
| **National Occupational Standards (NOS)** | Describe what a person needs to do, know and understand in a job to carry out the role in a consistent and competent way |
| **Optional Unit** | A unit that a learner may choose to complete to achieve the required number of units for award of the qualification |
| **Pathway** | A route to the achievement of a qualification that requires particular units to be achieved and is identified by an endorsement to a qualification title |
| **Qualification** | An award made to a Learner for the achievement of the required units or other components for that qualification |
| **Qualification Level** | An indication of the relative demand, complexity and/or depth of achievement, and/or the autonomy of the learner, represented by a qualification |
| **Qualifications Regulators** | Government-designated statutory organisations required to establish national standards for qualifications and secure consistent compliance with them |
| **Recognition of Prior Learning (RPL)** | A method of assessment that considers whether a learner can demonstrate that they can meet the assessment requirements for a unit through knowledge, understanding or skills they already possess and do not need to develop through a course of learning |
| **Sector Skills Council** | A body responsible for formulating and reviewing occupational standards for a specific sector across the UK, and for supporting the development of units and qualifications based on these standards. Each SSC is an employer-led, independent organisation and is licensed by government |
| **Standardisation Of Assessment** | A process to ensure that assessment leading to the award of qualifications is applied consistently by individuals, centres and awarding organisations |
| **Unique Learner Number (ULN)** | The unique number that is used to identify an individual learner |
| **Unit** | A component of a qualification |

## LEVEL 2 NVQ DIPLOMA IN RADIATION PROTECTION

**CONTENT OF THE QUALIFICATION**

**MANDATORY UNITS**

| | |
|---|---|
| **UNIT N225K** | **HOW TO RESPOND TO RADIATION INCIDENTS WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **4** |
| GUIDED LEARNING HOURS | **24** |

### Unit Overview

This unit addresses the knowledge required to respond to radiation incidents within ionising radiation environments.

### Assessment Guidance and Evidence Requirements

The learner should provide evidence to meet **all** the required knowledge and understanding within this unit. This could be provided through different types of evidence and assessment methods, for example learner statements, questioning and professional discussion which should be recorded for verification.

- This unit is subject to the requirements set out in the Cogent Assessment Strategy.
- The assumption is made that the person is a trained operative and that extra training and practise is required in incident and emergency procedures.

Discussion should take place with the assessor to demonstrate learner knowledge of relevant documentation;

- Health Physics procedures
- Emergency procedures

The main outcome of this activity is responding to radiation incidents, which could have an impact on the site or the surrounding area.

This activity includes obtaining information on potential radiation incidents and how they could develop; identifying actual incidents; following procedures for responding to radiation incidents; applying the organisation's radiation protection systems; identifying problems with the response and suggesting improvements.

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Know how potential radiation incidents could develop | 1.1. Describe the activities undertaken in the specified Industry in terms of:<br>a. Types of facilities<br>b. Materials<br>c. Processes<br>1.2. Explain how potential radiation incidents could occur from activities undertaken in the specified Industry |
| 2. Know the procedures for responding to radiation incidents | 2.1. Describe the structures and procedures within the organisation for responding to radiation incidents, including:<br>a. Health and Safety requirements<br>b. Radiation incidents<br>c. Radiation protection issues<br>d. Radiation protection systems<br>e. Radiation: types, sources and hazards |
| 3. Know the organisation's radiation protection systems | 3.1. List the radiation protection systems within an organisation |
| 4. Know the statutory requirements, regulations, and standards regarding radiation | 4.1. List the sources of authoritative information on radiation protection, including international, national and local |

| | |
|---|---|
| **UNIT N225C** | **RESPOND TO RADIATION INCIDENTS WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **3** |
| GUIDED LEARNING HOURS | **8** |

## Unit Overview

This unit addresses the skills required to respond to radiation incidents within ionising radiation environments

## Assessment Guidance and Evidence Requirements

### Evidence Requirements

The learner should provide evidence to meet all the assessment criteria within this unit.

The evidence must reflect, at all times, the policies and procedures of the workplace, as linked to current legislation and the values and principles for good practice in Radiation Protection.

If the assessor is unable to observe learners they will identify an expert witness in the workplace who will provide testimony of work-based performance. Usually, the assessor or expert witness will observe learners in real work activities and this should provide most of the evidence for the assessment criteria in this unit.

The learner should provide typical evidence for the following Learning Outcomes:

*Learning Outcome 1*

Worked examples of incidents or potential incidents learners have used, these are to include;

- Spread of radioactive contaminants
- High air sample counts
- High radiation dose rates

Information sources learners have used;

- Health Physics procedures
- Safe system of work/Permit to work
- Risk assessments
- Survey records or schedules

*Learning Outcome 2*

Worked examples showing learner involvement in an incident or exercise, identifying who was informed.

*Learning Outcome 3*

Worked example showing learner involvement in an incident or exercise.

Examples of completed set of records detailing learner involvement that is relevant to the process.

Witness statement to identify the consultation process learners used to seek advice from relevant personnel (e.g. Supervisor, Radiation Protection Supervisor (RPS), Radiation Protection Adviser (RPA)).

*Learning Outcome 4*

Worked examples showing learner involvement in an incident or exercise showing application of the radiation protection system.

*Learning Outcome 5*

Worked examples detailing problems learners identified with the response to the incident and actions taken by learners to inform the appropriate people.

Operating experience feedback examples that learners have been involved with, lessons learnt and improvements identified.

**Assessment Guidance**

- The use of simulation is acceptable in the assessment of this unit.
- This unit is subject to the requirements set out in the Cogent Assessment Strategy.
- This unit should not be taken prior to taking *N225k - How to Respond to Radiation Incidents within Ionising Radiation Environments*.
- The assumption is made that the person is a trained operative and that extra training and practise is required to meet the requirements of radiation incidents.

The person will be working to clearly defined procedures using relevant skills and information for routine work.

The main outcome of this activity is responding to radiation incidents, which could have an impact on the site or the surrounding area.

This activity includes obtaining information on potential radiation incidents and how they could develop; identifying actual incidents; following procedures for responding to radiation incidents; applying the organisation's radiation protection systems; identifying problems with the response and suggesting improvements.

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Be able to obtain information on potential radiation incidents | 1.1. Obtain information of how potential radiation incidents could develop as a result of the work activities being undertaken |
| 2. Be able to identify actual incidents | 2.2. Identify the radiation incident correctly and inform the relevant people |
| 3. Be able to follow procedures for responding to radiation incidents | 3.1. Follow the procedures, regulations, and guidelines for responding to the radiation incident<br>3.2. Seek advice to deal with any requirements beyond own technical competence<br>3.3. Comply with all relevant regulations and standards, and record all relevant actions and outcomes in the appropriate information systems |
| 4. Be able to apply the organisation's radiation protection systems | 4.1. Apply promptly the relevant radiation protection systems to respond to the radiation incident |
| 5. Be able to identify problems with the response and suggest improvements | 5.1. Identify any problems with the response to the radiation incident and inform the appropriate people as soon as possible<br>5.2. Identify any potential improvements in the response to the radiation incident |

| | |
|---|---|
| **UNIT N226K** | **HOW TO MONITOR RADIATION HAZARDS WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **3** |
| GUIDED LEARNING HOURS | **16** |

## Unit Overview

This unit addresses the knowledge required to monitor radiation hazards within ionising radiation environments.

## Assessment Guidance and Evidence Requirements

The learner should provide evidence to meet **all** the required knowledge and understanding within this unit. This could be provided through different types of evidence and assessment methods, for example learner statements, questioning and professional discussion which should be recorded for verification.

The learner should demonstrate understanding of:

- The organisations radiation protection systems & responsibilities, legal and local exposure limits, relevant Action Levels, the ALARP principle and dose records.
- Hierarchy of engineering controls.
- Monitoring equipment appropriate to the work, different types of radiation & nuclides.
- Need for different types of monitoring equipment, limitations of use, awareness of potential changes in environmental conditions and identifying abnormal conditions.
- When conditions change and what actions should be taken.
- Understanding of monitoring radiation conditions during work activities and the process of identifying potential improvements.

- This unit is subject to the requirements set out in the Cogent Assessment Strategy.

- The assumption is made that the person is a trained operative and more training and assessment is necessary to cope with the potential hazards and safety requirements.

The significant learning in this unit is about the uncontrolled hazard and the safety of the plant, equipment and people implicit with this.

This unit requires significant training and input. The actions are clearly defined, with clear limits and reporting lines.

The main outcome of this activity is the monitoring of radiation hazards. The hazards could relate to the activities, equipment, or materials in the workplace.

This activity includes obtaining information on the activities being undertaken, including any risk assessments; identifying any potential radiation hazards and their effects; applying radiation protection systems; identifying and responding to any uncontrolled hazards.

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Know how to identify any potential radiation hazards and their effects | 1.1. Explain how potential radiation hazards could be identified from activities undertaken in the specified industry in terms of:<br>a. Types of facilities<br>b. Materials<br>c. Processes<br>1.2. List the effects of potential radiation hazards that could occur from activities undertaken in the specified industry |
| 2. Know the radiation protection systems within the organisation | 2.1. List the radiation protection systems within an organisation |
| 3. Know how to identify and respond to any uncontrolled hazards | 3.1. Describe the structures and procedures within the organisation for responding to uncontrolled hazards, including:<br>a. Health and Safety requirements<br>b. Radiation protection issues<br>c. Radiation protection systems<br>d. Radiation: types, sources, and hazards<br>e. Risk Assessments |
| 4. Know the statutory requirements, regulations, and standards regarding radiation protection | 4.1. List the sources of authoritative information on radiation protection, including international, national, and local |

| | |
|---|---|
| **UNIT N226C** | **MONITOR RADIATION HAZARDS WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **3** |
| GUIDED LEARNING HOURS | **6** |

## Unit Overview

This unit addresses the skills required to monitor radiation hazards within ionising radiation environments.

## Assessment Guidance and Evidence Requirements

### Evidence Requirements

The learner should provide evidence to meet all the assessment criteria within this unit.

The evidence must reflect, at all times, the policies and procedures of the workplace, as linked to current legislation and the values and principles for good practice in Radiation Protection.

If the assessor is unable to observe learners they will identify an expert witness in the workplace who will provide testimony of work-based performance. Usually, the assessor or expert witness will observe learners in real work activities and this should provide most of the evidence for the assessment criteria in this unit.

The learner should provide typical types of evidence for the following Learning Outcomes:

*Learning Outcome 1*

Relevant documentation learners have used;

- Health Physics procedures
- Safe system of work/Permit to work
- Risk assessments
- Survey records or schedules
- Report to identify types of work activities

*Learning Outcome 2*

Worked examples learners have used to identify radiation hazards and exposure to radioactive materials for at least **three** of the following areas;

- Normal working conditions
- Potential airborne radioactivity
- Potential surface contamination
- High skin doses
- High radiation dose rates

The examples used should include;

- Reference to different types of radiation & nuclides
- A representative number of survey records undertaken during at least **three different tasks**
- A report covering aspects of exposure giving examples of doses accrued and internal/external exposure
- Air sampling results (including calculations)

*Learning Outcome 3*

Relevant documentation learners have used;

- Health Physics Procedures
- Safe system of work/Permit to work
- Risk Assessments
- Local Rules.
- A report detailing different types of dosimetry available and questioning to ensure learner understanding.
- Operating experience feedback examples that learners have been involved with, lessons learnt and improvements identified.

*Learning Outcome 4*

- Direct workplace observation of learners monitoring the work activity or carrying out a survey and exercising contamination and radiation dose control measures.
- Worked examples detailing problems learners have identified with the radiation conditions, the monitoring of those conditions (including problems with the monitoring equipment) and the actions taken.

*Learning Outcome 5*

Relevant documentation learners have used;

- Safe system of work/Permit to work
- Health Physics procedures indicating relevant standards
- Survey report
- Log record showing measured levels against expected standard levels

**Assessment Guidance**

- The use of simulation is not acceptable in the assessment of this unit.
- Workplace performance evidence is mandatory.
- This unit is subject to the requirements set out in the Cogent Assessment Strategy.
- This unit should not be taken prior to taking *N226k - How to Monitor Radiation Hazards within Ionising Radiation Environments*.
- The assumption is made that the person is a trained operative and more training and assessment is necessary to cope with the potential hazards and safety requirements.

In this scenario the person does not make any decisions, other than assessing the area efficiently and taking simple, immediate action.

The main outcome of this activity is the monitoring of radiation hazards. The hazards could relate to the activities, equipment, or materials in the workplace.

This activity includes obtaining information on the activities being undertaken, including any risk assessments; identifying any potential radiation hazards and their effects; applying radiation protection systems; identifying and responding to any uncontrolled hazards.

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Be able to obtain information on the activities being undertaken | 1.1. Obtain all relevant information on the work activities being undertaken and the radioactive materials and equipment being used, including any risk assessments |
| 2. Be able to identify any potential radiation hazards and their effects | 2.1. Identify any potential radiation hazards resulting from the activities being undertaken, and their potential effects if not controlled |
| 3. Be able to apply radiation protection systems | 3.1. Apply the organisation's radiation protection systems to monitor the radiation hazards<br>3.2. Comply with all relevant regulations and standards, and record all relevant actions and outcomes in the appropriate information systems |
| 4. Be able to identify any uncontrolled hazards and respond accordingly | 4.1. Assess whether the radiation hazards are being suitably controlled by the radiation protection systems<br>4.2. Identify any radiation hazards that are not being controlled and promptly take the appropriate action<br>4.3. Seek advice to deal with any requirements beyond own technical competence |
| 5. Be able to identify potential improvements to identification and monitoring of radiation hazards | 5.1. Identify any potential improvements to the identification and monitoring of radiation hazards that could be made |

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|---|---|
| **UNIT N227K** | **HOW TO MONITOR RADIATION CONDITIONS DURING WORK ACTIVITIES WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **3** |
| GUIDED LEARNING HOURS | **12** |

## Unit Overview

This unit addresses the knowledge required to monitor radiation conditions during work activities within ionising radiation environments.

## Assessment Guidance and Evidence Requirements

**Information on use of Assessment Context**

This unit covers standard routine work in general but includes an ability to understand the potential hazards and the actions to take during changes in state.

This activity includes:

- obtaining information on the work activities being undertaken
- identifying the potential radiation hazards and exposure levels
- monitoring the radiation conditions
- comparing the radiation conditions with relevant standards
- identifying any problems with the radiation conditions

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

**Assessment Guidance and Evidence Requirements**

This unit is subject to the requirements set out in the Cogent Assessment Strategy.

The learner should provide evidence to meet all the required knowledge and understanding within this unit. This could be provided through different types of evidence and assessment methods, for example learner statements, questioning and professional discussion which should be recorded for verification.

- Demonstrate learner understanding of the organisations radiation protection systems & responsibilities.
- Documentation and questioning to demonstrate learner understanding of legal and local exposure limits, relevant Action Levels, the ALARP principle and dose records.
- Demonstrate learner understanding of hierarchy of engineering controls.
- Questioning to demonstrate learner selection of monitoring equipment appropriate to the work, different types of radiation & nuclides.
- Questioning to demonstrate why/when learners would need different types of monitoring equipment, limitations of use, awareness of potential changes in environmental conditions and identifying abnormal conditions.

- Questioning to demonstrate learner knowledge and understanding of when conditions change and what actions should be taken.
- Witness statement or questioning to ensure learner understanding monitoring radiation conditions during work activities and the process of identifying potential improvements.

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Know the potential radiation hazards and exposure levels | 1.1. Explain how potential radiation hazards could be identified from activities undertaken in the specified Industry in terms of:<br>a. Types of facilities<br>b. Materials<br>c. Processes<br>1.2. Describe how Dosimetry Assessments are used to monitor the levels of exposure to radiation from activities undertaken in the specified Industry<br>1.3. List the sources of authoritative information on radiation protection |
| 2. Know how to monitor the radiation conditions | 2.1. Describe the radiation monitoring equipment used within the specified Industry |
| 3. Know how to compare the radiation conditions with relevant standards | 3.1. Describe the structures and procedures within the organisation for monitoring radiation, including:<br>a. Health and Safety requirements<br>b. Radiation protection issues<br>c. Radiation protection systems<br>d. Radiation: types, sources and hazards |
| 4. Know the statutory requirements, regulations and standards regarding radiation protection | 4.1. List the sources of authoritative information on radiation protection, including international, national and local |

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|---|---|
| **UNIT N227C** | **MONITOR RADIATION CONDITIONS DURING WORK ACTIVITIES WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **2** |
| GUIDED LEARNING HOURS | **4** |

## Unit Overview

This unit addresses the skills required to monitor radiation conditions during work activities within ionising radiation environments.

## Assessment Guidance and Evidence Requirements

### Information on use of Assessment Context

This activity includes:

- obtaining information on the work activities being undertaken
- identifying the potential radiation hazards and exposure levels
- monitoring the radiation conditions
- comparing the radiation conditions with relevant standards
- identifying any problems with the radiation conditions

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

### Assessment Guidance and Evidence Requirements

- The use of simulation is not acceptable in the assessment of this unit.
- Workplace performance evidence is mandatory.
- This unit is subject to the requirements set out in the Cogent Assessment Strategy.
- This unit should not be taken prior to taking *N227K - How to Monitor Radiation Conditions During Work Activities Within Ionising Radiation Environments.*

The learner should provide typical evidence for the following Learning Outcomes:

*Learning Outcome 1*

Relevant documentation learners have used;

- Health Physics procedures
- Safe system of work/Permit to work
- Risk assessments
- Survey records or schedules
- And/or report to identify types of work activities

*Learning Outcome 2*

Worked examples learners have used to identify radiation hazards and exposure to radioactive materials for at least **three** of the following areas;

- Normal working conditions
- Potential airborne radioactivity
- Potential surface contamination
- High skin doses
- High radiation dose rates.

The examples used should include;

- Reference to different types of radiation & nuclides
- A representative number of survey records undertaken during at least **three different tasks**
- A report covering aspects of exposure giving examples of doses accrued and internal/external exposure
- Air sampling results (including calculations)

Relevant documentation learners have used;

- Health Physics Procedures
- Safe system of work/Permit to work
- Risk Assessments
- Local Rules

A report detailing different types of dosimetry available and questioning to ensure learner understanding.

Witness statement to identify the consultation process learners used to seek advice from relevant personnel (e.g. Supervisor, Radiation Protection Supervisor (RPS), Radiation Protection Adviser (RPA)).

*Learning Outcome 3*

Direct workplace observation of learners monitoring the work activity or carrying out a survey and exercising contamination and radiation dose control measures.

*Learning Outcome 4*

Relevant documentation learners have used;

- Safe system of work/Permit to work
- Health Physics procedures indicating relevant standards
- Survey report
- Log record showing measured levels against expected standard levels

*Learning Outcome 5*

Worked examples detailing problems learners have identified with the radiation conditions, the monitoring of those conditions (including problems with the monitoring equipment) and the actions taken by learners.

Operating experience feedback examples that learners have been involved with, lessons learnt and improvements identified.

Example of completed sets of records detailing learner involvement that is relevant to the process.

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Be able to obtain information on the work activities being undertaken | 1.1. Obtain information on the type of work activities being undertaken |
| 2. Be able to identify the potential radiation hazards and exposure levels | 2.1. Identify the potential radiation hazards and exposure to radioactive materials arising from the work activities being undertaken<br>2.2. Obtain information about the use of:<br>a. Radiation protection systems<br>b. Personal protective equipment<br>c. Personal radiation or contamination exposure limits<br>d. Any other applicable control measures<br>2.3. Seek advice to deal with any requirements beyond own technical competence |
| 3. Be able to monitor the radiation conditions | 3.1. Select suitable monitoring equipment for the radiation conditions during the work activities<br>3.2. Monitor the radiation conditions by using the appropriate monitoring equipment at suitable times during the work activities |
| 4. Be able to compare the radiation conditions with relevant standards | 4.1. Compare the measured levels of radiation with the relevant standards for the work being undertaken |
| 5. Be able to identify any problems with the radiation conditions | 5.1. Identify any problems with the radiation conditions and take the appropriate action<br>5.2. Identify any potential improvements in the way the radiation conditions could be monitored<br>5.3. Comply with all relevant regulations and standards and record all relevant actions and outcomes in the appropriate information systems |

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|---|---|
| UNIT N228K | HOW TO MONITOR PEOPLE DURING RADIATION-RELATED WORK ACTIVITIES WITHIN IONISING RADIATION ENVIRONMENTS |
| LEVEL | **2** |
| CREDIT VALUE | **2** |
| GUIDED LEARNING HOURS | **16** |

## Unit Overview

This unit addresses the knowledge required to monitor people during radiation-related work activities within ionising radiation environments.

## Assessment Guidance and Evidence Requirements

### Information on use of Assessment Context

Significant extra training is required to understand about personal protection, including behaviour in controlled areas.

The training and practice support the person in completing well-defined routine tasks and coping with straightforward problems.

The main outcome of this activity is the monitoring of people's exposure to radiation during specific work activities.

This activity includes obtaining information on the work activities being undertaken, and the potential exposure level; monitoring the radiation doses received by workers; identifying any problems, and suggesting improvements.

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

### Assessment Guidance and Evidence Requirements

This unit is subject to the requirements set out in the Cogent Assessment Strategy.

The learner should provide evidence to meet all the required knowledge and understanding within this unit. This could be provided through different types of evidence and assessment methods, for example learner statements, questioning and professional discussion which should be recorded for verification.

Questioning to demonstrate learner selection of monitoring equipment appropriate to the work, different types of radiation & nuclides.

Questioning to demonstrate why/when learners would need different types of monitoring equipment, limitations of use, awareness of potential changes in environmental conditions and identifying abnormal conditions.

Questioning to demonstrate learner knowledge and understanding of when conditions change and what actions should be taken.

Questioning to demonstrate learner understanding and relevance of;

- Action levels/hold points
- Dose records
- Survey reports

Witness statement or questioning to ensure learner understanding of monitoring people during work activities and the process of identifying potential improvements.

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Know how the potential exposure level may vary with the type of work activities being undertaken | 1.1. Explain how potential exposure levels vary from activities undertaken in the specified Industry in terms of:<br>a. Types of facilities<br>b. Materials<br>c. Processes<br>1.2. Describe the structures and procedures within the organisation for monitoring radiation, including:<br>a. Health and Safety requirements<br>b. Radiation protection issues<br>c. Radiation protection systems<br>d. Radiation: types, sources and hazards<br>1.3. List the sources of authoritative information on radiation protection |
| 2. Know how to monitor the radiation doses received by workers | 2.1. Explain how the levels of exposure to radiation are monitored through Dosimetry Assessments<br>2.2. Describe the Radiation monitoring equipment used within the specified Industry |
| 3. Know the statutory requirements, regulations and standards regarding radiation protection | 3.1. List the sources of authoritative information on radiation protection, including international, national and local |

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|---|---|
| **UNIT N228C** | **MONITOR PEOPLE DURING RADIATION-RELATED WORK ACTIVITIES WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **2** |
| GUIDED LEARNING HOURS | **4** |

## Unit Overview

This unit addresses the skills required to monitor people during radiation-related work activities within ionising radiation environments.

## Assessment Guidance and Evidence Requirements

**Information on use of Assessment Context**

The person should complete well defined tasks using relevant skills and take responsibilities for actions and judgements.

The main outcome of this activity is the monitoring of people's exposure to radiation during specific work activities.

This activity includes obtaining information on the work activities being undertaken, and the potential exposure level; monitoring the radiation doses received by workers; identifying any problems, and suggesting improvements.

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

**Assessment Guidance and Evidence Requirements**

- The use of simulation is not acceptable in the assessment of this unit.
- Workplace performance evidence is mandatory.
- This unit is subject to the requirements set out in the Cogent Assessment Strategy.
- This unit should not be taken prior to taking *N228K - How to Monitor People During Radiation-Related Work Activities Within Ionising Radiation Environments*.

The learner should provide typical evidence for the following Learning Outcomes:

*Learning Outcome 1*

Relevant documentation learners have used;
- Health Physics procedures
- Safe system of work/Permit to work
- Risk assessments
- Survey records or schedules
- And/or report to identify types of work activities

*Learning Outcome 2*

Direct workplace observation of learners monitoring the work activity and personnel and exercising contamination and radiation dose control measures.

Example of completed sets of records detailing learner involvement that is relevant to the process.
At least 3 different tasks to be covered using a range of instruments

*Learning Outcome 3*

Worked examples detailing problems learners have revealed by the monitoring of radiation (including problems with the monitoring equipment) and the actions taken.

Operating experience feedback examples that learners have been involved with, lessons learnt and improvements identified.

Witness statement to identify the consultation process learners used to seek of advice from relevant personnel (e.g. Supervisor, Radiation Protection Supervisor (RPS), Radiation Protection Adviser (RPA)).

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Be able to obtain information on the work activities being undertaken and their impact on the potential exposure level | 1.1. Obtain information on the type of radiation-related work activities being undertaken |
| 2. Be able to monitor the radiation doses received by workers | 2.1. Select suitable radiation monitoring equipment for monitoring the exposure of people undertaking the work activities<br>2.2. Undertake personnel monitoring during or after the work activities according to organisational procedures<br>2.3. Monitor the dose received by people undertaking the radiation-related work activities by using the appropriate systems<br>2.4. Comply with all relevant regulations and standards, and record all relevant actions and outcomes in the appropriate information systems |
| 3. Be able to identify any problems and suggest improvements | 3.1. Ensure that any problems revealed by the monitoring of radiation are identified and appropriate action taken according to organisational procedures<br>3.2. Identify any potential improvements in the way personnel monitoring could be undertaken<br>3.3. Seek advice to deal with any requirements beyond own technical competence |

| | |
|---|---|
| **UNIT N229K** | **HOW TO MONITOR ENVIRONMENTAL CONDITIONS DURING RADIATION-RELATED WORK ACTIVITIES WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **3** |
| GUIDED LEARNING HOURS | **18** |

## Unit Overview

This unit addresses the knowledge required to monitor environmental conditions during radiation-related work activities within ionising radiation environments.

## Assessment Guidance and Evidence Requirements

**Information on use of Assessment Context**

Legislation and knowledge of the potential release of gaseous, solid and liquids to the atmosphere need to be covered, plus how to monitor for this.

The work is routine, to prescribed procedures and minimal autonomy.

The main outcome of this activity is the monitoring of the exposure of the internal and external environment to radiation during radiation-related work activities.

This activity includes obtaining information on the work activities being undertaken, and the potential exposure level; monitoring the radiation released to the environment; identifying any problems, and suggesting improvements.

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

**Assessment Guidance and Evidence Requirements**

This unit is subject to the requirements set out in the Cogent Assessment Strategy.

The learner should provide evidence to meet all the required knowledge and understanding within this unit. This could be provided through different types of evidence and assessment methods, for example learner statements, questioning and professional discussion which should be recorded for verification.

- Questioning to demonstrate learner selection of monitoring equipment appropriate to the work, different types of radiation & nuclides.
- Questioning to demonstrate why/when learners would need different types of monitoring equipment, limitation of use, awareness of potential changes in environmental conditions and identifying abnormal conditions.
- Questioning to demonstrate learner knowledge and understanding of when conditions change and what actions should be taken.
- Witness statement or questioning to ensure learner understanding of monitoring environmental condition and the process of identifying potential improvements.

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Know how the potential for radiation released to the environment can vary with the type of work activities being undertaken | 1.1. Explain how the potential for radiation released to the environment can vary from activities undertaken in the specified Industry in terms of:<br>a. Types of facilities<br>b. Materials<br>c. Processes<br>1.2. Describe the structures and procedures within the organisation for monitoring radiation, including;<br>a. Health and Safety requirements<br>b. Radiation protection issues<br>c. Radiation protection systems<br>d. Radiation: types, sources, and hazards<br>1.3. Identify and locate sources of authoritative information on radiation protection |
| 2. Know how to monitor the radiation released to the environment | 2.1. Explain how the levels of exposure to radiation are monitored through Dosimetry Assessments<br>2.2. Describe the radiation monitoring equipment used within the specified Industry |
| 3. Know the statutory requirements, regulations, and standards regarding radiation released to the environment | 3.1. List the sources of authoritative information on radiation protection, including international, national, and local |

| | |
|---|---|
| **UNIT N229C** | **MONITOR ENVIRONMENTAL CONDITIONS DURING RADIATION-RELATED WORK ACTIVITIES WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **3** |
| GUIDED LEARNING HOURS | **6** |

## Unit Overview

This unit addresses the skills required to monitor environmental conditions during radiation-related work activities within ionising radiation environments.

## Assessment Guidance and Evidence Requirements

**Information on use of Assessment Context**

Environmental legislation and off-site monitoring are extra to the norm. A greater emphasis on practise is necessary.

The monitoring work is standard and clearly prescribed. An ability to respond to changes in the environment is required.

The main outcome of this activity is the monitoring of the exposure of the internal and external environment to radiation during radiation-related work activities.

This activity includes obtaining information on the work activities being undertaken, and the potential exposure level; monitoring the radiation released to the environment; identifying any problems, and suggesting improvements.

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

**Assessment Guidance and Evidence Requirements**

- The use of simulation is not acceptable in the assessment of this unit.
- Workplace performance evidence is mandatory.
- This unit is subject to the requirements set out in the Cogent Assessment Strategy.
- This unit should not be taken prior to taking *N229K - How to Monitor Environmental Conditions During Radiation-Related Work Activities within Ionising Radiation Environments*.

The learner should provide typical evidence for the following Learning Outcomes:

*Learning Outcome 1*

Relevant documentation learners have used;
- Health Physics procedures
- Safe system of work/permit to work
- Risk assessments
- Sample records or schedules
- And/or report to identify types of work activities

*Learning Outcome 2*

Direct workplace observation of learners undertaking environmental monitoring after the work activity and exercising contamination and radiation dose control measures, for three different tasks

Relevant documentation learners have used;
- Sample records
- Use of equipment/calculations of discharges

*Learning Outcome 3*

Worked examples detailing problems learners have revealed by the environmental monitoring (including problems with the monitoring equipment) and the actions taken.

Operating experience feedback examples that learners have been involved with, lessons learnt and improvements identified.

Example of completed sets of records detailing learner involvement that is relevant to the process.

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Be able to obtain information on the work activities being undertaken and their impact on the potential exposure level | 1.1. Obtain information on the type of radiation-related work activities being undertaken |
| 2. Be able to monitor the radiation released to the environment | 2.1. Select suitable radiation monitoring equipment for monitoring the exposure of people undertaking the work activities<br>2.2. Undertake environmental monitoring during or after the work activities according to organisational procedures<br>2.3. Monitor the dose received by the environment using the appropriate systems<br>2.4. Comply with all relevant regulations and standards, and record all relevant actions and outcomes in the appropriate information systems |
| 3. Be able to identify any problems and suggest improvements | 3.1. Ensure that any problems revealed by the monitoring of radiation are identified and appropriate action taken according to organisational procedures<br>3.2. Identify any potential improvements in the way environmental monitoring could be undertaken<br>3.3. Seek advice to deal with any requirements beyond own technical competence |

| | |
|---|---|
| **UNIT N230K** | **HOW TO TEST THE FUNCTIONING OF RADIATION PROTECTION EQUIPMENT WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **3** |
| GUIDED LEARNING HOURS | **24** |

## Unit Overview

This unit addresses the knowledge required to test the functioning of radiation protection equipment within ionising radiation environments.

## Assessment Guidance and Evidence Requirements

**Information on use of Assessment Context**

This unit requires involved training and assessment to cope with range of equipment used, but specifically to learn about and deal with radioactive sources for calibration.

The person should understand the information, facts and procedures to complete the testing and interpret the results. The unit requires routine work.

The main outcome of this activity is the functional testing of radiation protection equipment. The equipment will most likely be either fixed or portable monitoring equipment.

This activity includes obtaining information on the equipment; examining the equipment and following testing procedures; identifying any problems and confirming that it works correctly.

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

**Assessment Guidance and Evidence Requirements**

This unit is subject to the requirements set out in the Cogent Assessment Strategy.

The learner should provide evidence to meet all the required knowledge and understanding within this unit. This could be provided through different types of evidence and assessment methods, for example learner statements, questioning and professional discussion which should be recorded for verification.

Questioning to demonstrate learner knowledge and understanding of installed and portable radiation protection equipment in the workplace.

Questioning to demonstrate learner knowledge of;

- Expected radiation protection equipment response
- Environmental conditions that could affect radiation protection equipment response
- Fault diagnosis
- Fault finding and reporting
- Quarantine procedures

Witness statement or questioning to ensure learner understanding of function testing of radiation protection equipment and the process of identifying potential improvements.

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Know the types of functional tests performed on radiation protection equipment | 1.1. Describe the types of fixed or portable radiation monitoring equipment used in activities undertaken by the specified Industry in terms of:<br>a. Types of facilities<br>b. Materials<br>c. Processes<br>1.2. Describe the types of functional tests performed on radiation protection equipment |
| 2. Know how to examine the equipment and follow testing procedures | 2.1. Explain the maintenance procedures for radiation protection equipment<br>2.2. Describe the structures and procedures within the organisation for testing procedures on radiation protection equipment, including:<br>a. Health and Safety requirements<br>b. Radiation protection systems<br>c. Radiation: types, sources and hazards |
| 3. Know how equipment conforms to all relevant statutory requirements, regulations and standards | 3.1. List the sources of authoritative information on radiation protection, including international, national and local |

| | |
|---|---|
| **UNIT N230C** | **TEST THE FUNCTIONING OF RADIATION PROTECTION EQUIPMENT WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **3** |
| GUIDED LEARNING HOURS | **8** |

## Unit Overview

This unit addresses the skills required to test the functioning of radiation protection equipment within ionising radiation environments.

## Assessment Guidance and Evidence Requirements

**Information on use of Assessment Context**

The person will be working to clearly defined procedures using relevant skills and information for routine work.

The main outcome of this activity is the functional testing of radiation protection equipment. The equipment will most likely be either fixed or portable monitoring equipment.

This activity includes obtaining information on the equipment; examining the equipment and following testing procedures; identifying any problems and confirming that it works correctly.

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

**Assessment Guidance and Evidence Requirements**

- The use of simulation is not acceptable in the assessment of this unit.
- Workplace performance evidence is mandatory.
- This unit is subject to the requirements set out in the Cogent Assessment Strategy.
- This unit should not be taken prior to taking *N230K - How to Test the Functioning of Radiation Protection Equipment Within Ionising Radiation Environments*.

The learner should provide typical evidence for the following Learning Outcomes:

*Learning Outcome 1*

Relevant documentation learners have used from which instruction has been taken;

- Manufacturers operating and technical manuals
- Maintenance schedules
- Calibration procedures
- Local work procedures

*Learning Outcome 2*

Direct workplace observation of learners function testing radiation protection equipment which should include;

- Radioactive source handling and control
- Operation of the radiation protection equipment

At least three different types of equipment, both fixed and portable, must be covered, and three problems resolved

Relevant documentation learners have used from which instruction has been taken;

- Manufacturers operating and technical manuals
- Calibration procedures
- Local work procedures

*Learning Outcome 3*

Relevant documentation learners have used from which instruction has been taken;

- Repair/servicing procedures
- Investigation reports

Operating experience feedback examples that learners have been involved with, lessons learnt and improvements identified.

Witness statement to identify the consultation process learners used to seek advice from relevant personnel (e.g. Supervisor, Radiation Protection Supervisor (RPS), Radiation Protection Adviser (RPA)).

Example of completed sets of records detailing learner involvement that is relevant to the process.

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Be able to obtain information on the radiation protection equipment and appropriate function testing | 1.1. Identify which radiation protection equipment and functions need to be tested<br>1.2. Obtain information on the established functional testing procedures and schedule for the radiation protection equipment |
| 2. Be able to examine the equipment, following testing procedures | 2.1. Functionally test the radiation protection equipment according to the established functional testing procedures<br>2.2. Determine whether the radiation protection equipment is working according to specified parameters |
| 3. Be able to identify and correct any problems | 3.1. Identify any problems with the radiation protection equipment and take the appropriate action<br>3.2. Identify any potential improvements in the functional testing procedures or schedule that could be made<br>3.3. Seek advice to deal with any requirements beyond own technical competence<br>3.4. Comply with all relevant regulations and standards, and record all relevant actions and outcomes in the appropriate information systems |

**OPTIONAL UNITS**

| | |
|---|---|
| **UNIT N231K** | **HOW TO UNDERTAKE RADIATION-RELATED WORK ACTIVITIES WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **2** |
| GUIDED LEARNING HOURS | **12** |

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## Unit Overview

This unit addresses the knowledge required to undertake radiation-related work activities within ionising radiation environments.

## Assessment Guidance and Evidence Requirements

### Information on use of Assessment Context

This unit requires training and practise for the different hazards and the personal protective equipment, including contamination and control clothing.

The person should understand and implement standard procedures, maintain up to date information and communicate with work colleagues.

The main outcome of this activity is the undertaking of work activities where there are potential radiation hazards.

This activity includes obtaining information on the work activities that are required; identifying radiation hazards that are involved in the work; using personal protective equipment and radiation protection systems; assisting colleagues; undertaking the work activities; identifying and reporting any problems.

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

### Assessment Guidance and Evidence Requirements

This unit is subject to the requirements set out in the Cogent Assessment Strategy.

The learner should provide evidence to meet all the required knowledge and understanding within this unit. This could be provided through different types of evidence and assessment methods, for example learner statements, questioning and professional discussion which should be recorded for verification.

Discussion with assessor to demonstrate learner understanding of the organisations radiation protection systems & responsibilities.

Demonstrate learner understanding of the use of PPE in different conditions. Relevant documentation learners have used;

- Health Physics procedures
- Safe system of work/permit to work
- Risk assessments
- Survey records or schedules
- Local Rules
- And/or report to identify types of work activities

Witness statement or questioning to ensure learners understanding of working with radiation and the process of identifying potential improvements.

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Know how to identify radiation hazards that are involved in the work | 1.1. Explain how potential radiation hazards vary from work activities undertaken in the specified Industry in terms of:<br>a. Types of facilities<br>b. Materials<br>c. Processes<br>1.2. Describe the structures and procedures within the organisation for undertaking radiation-related work activities, including:<br>a. Health and Safety requirements<br>b. Use of Personal Protective Equipment<br>c. Radiation protection systems<br>d. Radiation: types, sources and hazards |
| 2. Know how to use personal protective equipment and radiation protection systems | 2.1. Describe different items of Personal Protective Equipment and the purposes for which they are used<br>2.2. Describe the radiation protection systems used within the specified Industry |
| 3. Know the statutory requirements, regulations and standards regarding radiation protection | 3.1. List the sources of authoritative information on radiation protection, including international, national and local |

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| **UNIT N231C** | **UNDERTAKE RADIATION-RELATED WORK ACTIVITIES WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **2** |
| GUIDED LEARNING HOURS | **4** |

## Unit Overview

This unit addresses the skills required to undertake radiation-related work activities within ionising radiation environments.

## Assessment Guidance and Evidence Requirements

**Information on use of Assessment Context**

This is normal work that all operatives undertake. Practise and assessment is required to maintain specific standards.

The learner will be working to clearly defined procedures and systems. There must be an ability to take and interpret information and communicate with colleagues.

The main outcome of this activity is the undertaking of work activities where there are potential radiation hazards.

This activity includes obtaining information on the work activities that are required; identifying radiation hazards that are involved in the work; using personal protective equipment and radiation protection systems; assisting colleagues; undertaking the work activities; identifying and reporting any problems.

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

**Assessment Guidance and Evidence Requirements**

- The use of simulation is not acceptable in the assessment of this unit.
- Workplace performance evidence is mandatory.
- This unit is subject to the requirements set out in the Cogent Assessment Strategy.
- This unit should not be taken prior to taking *N231K - How to Undertake Radiation-Related Work Activities within Ionising Radiation Environments*.

The learner should provide typical evidence for the following Learning Outcomes:

*Learning Outcome 1*

Relevant documentation learners have used;
- Health Physics procedures
- Safe system of work/permit to work
- Risk assessments
- Survey records or schedules
- Local Rules
- And/or report to identify types of work activities

*Learning Outcome 2*

Worked examples covering detailed outline of the radiation hazards associated with the work learners undertook for at least **three** of the following;

- Normal working conditions
- Potential airborne radioactivity
- Potential surface radioactive contamination
- High skin doses
- High radiation dose rates

The examples used should include reference to different types of radiation & nuclides.

*Learning Outcome 3*

Relevant documentation learners have used;

- Health Physics Procedures
- Safe system of work/Permit to work
- Risk assessments
- Local Rules

Worked examples to showing learner involvement in identifying suitable types of Personal Protective Equipment (PPE) used and their purpose.

Work place observation of correct use PPE.

At least three different tasks must be completed covering two different contamination levels involving use of breathing apparatus

*Learning Outcome 4*

Workplace observation of learners assisting others in the correct use of PPE e.g. dressing/undressing.

*Learning Outcome 5*

Workplace observation of learners undertaking tasks to the required standards. Evidence can be taken from log reports or other related task sheets.

Workplace observation of learner involvement in clean up and waste disposal activities demonstrating an understanding of organisational procedures, legal requirements for control, disposal and minimisation of radioactive waste.

*Learning Outcome 6*

Worked examples showing where learners were involved in identifying where safety requirements have not been complied with and the actions learners took.

This could include investigation report.

Worked examples detailing problems learners have identified with the radiation protection systems and the actions taken.

Operating experience feedback examples that learners have been involved with, lessons learnt and improvements identified.

Example of completed sets of records detailing learners' involvement that is relevant to the process.

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Be able to obtain information on the work activities that are required | 1.1. Obtain clear information on the radiation-related work activity being undertaken |
| 2. Be able to identify radiation hazards that are involved in the work | 2.1. Identify the radiation hazards that are involved in the radiation-related work activity |
| 3. Be able to use personal protective equipment and radiation protection systems | 3.1. Confirm the availability and functioning of the radiation protection systems that are used during the radiation-related work activity<br>3.2. Identify and use suitable personal protective equipment and procedures for the radiation hazards encountered during the radiation-related work activity |
| 4. Be able to assist colleagues | 4.1. Assist colleagues to use the appropriate personal protective equipment and procedures |
| 5. Be able to undertake the work activities | 5.1. Undertake the radiation-related work activities according to the specified requirements<br>5.2. Clean up work areas and dispose of all waste after the completion of the radiation-related work activity according to organisational procedures |
| 6. Be able to identify and report any problems | 6.1. Identify situations where safety requirements are not being complied with, and report them to an appropriate colleague<br>6.2. Report any problems with the radiation protection systems to the appropriate people according to organisational procedures<br>6.3. Identify any potential improvements in the way that the radiation-related work activity could be carried out<br>6.4. Comply with all relevant regulations and standards, and record all relevant actions and outcomes in the appropriate information systems |

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| **UNIT N232K** | **HOW TO RECORD INFORMATION ON RADIATION PROTECTION WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **2** |
| GUIDED LEARNING HOURS | **16** |

## Unit Overview

This unit addresses the knowledge required to record information on radiation protection within ionising radiation environments.

## Assessment Guidance and Evidence Requirements

**Information on use of Assessment Context**

This unit deals with extra training identified for the types of records and the complexity of the system.

The learner will be applying standard procedures for well defined tasks and there will be a clear understanding of records to be filed, maintained and retrieved.

The main outcome of this activity is the recording of information relating to radiation protection.

This activity includes identifying the information that needs to be recorded; producing and maintaining records; securing records, and restricting access to them.

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

**Assessment Guidance and Evidence Requirements**

This unit is subject to the requirements set out in the Cogent Assessment Strategy.

The learner should provide evidence to meet all the required knowledge and understanding within this unit. This could be provided through different types of evidence and assessment methods, for example learner statements, questioning and professional discussion which should be recorded for verification.

Discussion with the assessor giving clear reasons as to why information is recorded.

Discussion with the assessor to demonstrate learner knowledge of the need for the storage & retention of records as per organisational requirements.

Discussion with the assessor to demonstrate learner knowledge of procedures for the correct storage & retention of records as per organisational requirements.

Discussion or worked example in which learners have been involved to identify potential problems the maintenance and security of records and what action was taken.

**Learning Outcome and Assessment Criteria**

| Learning outcomes<br>The learner will: | Assessment criteria<br>The learner can: |
|---|---|
| 1. Know how to identify the information that needs to be recorded | 1.1. Describe the types of information on radiation protection that need to be recorded in the specified Industry in terms of the following:<br>a. Types of facilities<br>b. Materials<br>c. Processes<br>1.2. Describe the structures and procedures within the organisation for recording radiation information on radiation protection, including:<br>a. Health and Safety requirements<br>b. Radiation protection issues<br>c. Radiation protection systems<br>d. Radiation: types, sources and hazards |
| 2. Know how to produce and maintain records | 2.1. Explain the communication and presentation methods required for recording radiation information<br>2.2. Describe the types of information systems used for recording radiation information |
| 3. Know how to secure records and restrict access to them | 3.1. Explain how to secure records and restrict access to them using appropriate information systems |
| 4. Know the statutory requirements, regulations and standards regarding radiation protection | 4.1. List the sources of authoritative information on radiation protection, including international, national and local<br>4.2. Detail the statutory requirements, regulations and standards, including international, national and local |

| | |
|---|---|
| **UNIT N232C** | **RECORD INFORMATION ON RADIATION PROTECTION WITHIN IONISING RADIATION ENVIRONMENTS** |
| LEVEL | **2** |
| CREDIT VALUE | **2** |
| GUIDED LEARNING HOURS | **8** |

## Unit Overview

This unit addresses the skills required to record information on radiation protection within ionising radiation environments.

## Assessment Guidance and Evidence Requirements

**Information on use of Assessment Context**

All radiation contamination records on Nuclear Sites are termed 'life time records' and are retained for the life of the organisation, so the record systems become enormous. Staff need to be trained and assessed on a large, complex record system to record, store and retrieve.

The person will be working to clearly defined procedures within a closely regulated system and there will be no ability to change these systems.

The main outcome of this activity is the recording of information relating to radiation protection.

This activity includes identifying the information that needs to be recorded; producing and maintaining records; securing records, and restricting access to them.

This activity is likely to be undertaken by someone whose work role is exercised in an environment where radiation protection is important.

During this work the learner must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO THE LEARNER.

**Assessment Guidance and Evidence Requirements**

- The use of simulation is not acceptable in the assessment of this unit.
- Workplace performance evidence is mandatory.
- This unit is subject to the requirements set out in the Cogent Assessment Strategy.
- This unit should not be taken prior to taking *N232K - How to Record Information on Radiation Protection Within Ionising Radiation Environments.*

The learner should provide typical evidence for the following Learning Outcomes:

*Learning Outcome 1*

Relevant documentation learners have used;

- Health Physics procedures
- Health Physics records e.g. air samples, surveys, and source accountancy
- Example of completed sets of records detailing learner involvement that is relevant to the process.

*Learning Outcome 2*

Copies of records produced by learners that are clear, complete and legible.

*Learning Outcome 3*

Demonstrate to assessor the understanding of the need for storage & retention of records as per the organisational requirements

Demonstrate to assessor the access procedures for the correct storage retention of records as per organisational requirements

Evidence of involvement in identifying potential problems with the maintenance and security of records, and the action taken

**Learning Outcome and Assessment Criteria**

| **Learning outcomes**<br>**The learner will:** | **Assessment criteria**<br>**The learner can:** |
|---|---|
| 1. Be able to identify the information that needs to be recorded | 1.1. Identify the information relevant to radiation protection that needs to be recorded<br>1.2. Comply with all relevant regulations and standards, and record all relevant actions and outcomes in the appropriate information systems |
| 2. Be able to produce and maintain records | 2.1. Produce records on radiation protection that are clear, complete and legible |
| 3. Be able to secure records and restrict access to them | 3.1. Maintain and secure records on radiation protection according to the requirements of the information management systems<br>3.2. Restrict access to the records on radiation protection according to the requirements of the information management systems<br>3.3. Identify any problems with the maintenance and security of records and inform the relevant people |