No. 179 24 February 2006

SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)

In accordance with regulation 24(c) of the National Standards Bodies Regulations of 28 March 1998, the Standards Generating Body (SGB) for

Radiation Protection

Registered by Organising Field 10, Physical, Computer and Life Sciences, publishes the foliowing qualification and unit standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the qualification and unit standards. The qualification and unit standards can be accessed via the SAQA web-site at **www.saqa.org.za**. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, **Hatfield Forum West, 1067 Arcadia Street, Hatfield, Pretoria.**

Comment on the qualification and unit standards should reach SAQA at the address ***below and no later than 23 March 2006.*** All correspondence should be marked **Standards Setting – SGB for Radiation Protection** and addressed to

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Attention: Mr. D Mphuthing
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DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:

SAQA QUAL ID	*QUALIFICATION TITLE*		
50329	Further Education and Training Certificate: Radiation Protection		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB for Radiation Protection		10	
QUAL TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD*
Further Ed and Training Cert		Physical, Mathematical, Computer and Life Sciences	Physical Sciences
ABET BAND	*MINIMUM CREDITS*	*NQF LEVEL*	*QUALIFICATION CLASS*
Undefined	120	Level 4	Regular-Unit Stds Based

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose:

The qualification is aimed at providing a nationally recognised qualification in the radiation protection environment, and at strengthening professional standards within the discipline. This qualification builds on lower level competence, and allows the learner to progress onto higher levels on the Framework within a radiation protection career path. The qualification will improve relationships between employers and employees, and organisations and their clients (communities) and will attract and retain quality employees.

Qualified learners will be able to interpret information regarding radiation and make decisions based on evaluation- They will know the regulations and rules relevant for specific radiation protection contexts, and will be able to supervise others.

The qualifying learner is capable of:

> Determining safety precautions based on radiation protection rules, procedures and standards for a specific task or environment.
> Assessing and interpreting radiological survey results and determine appropriate plan of action or procedures under routine and ad hoc/non-routine task conditions.
> Ensuring implementation of radiological safety compliance of a specific context/work unit.
> Recording and reporting on radiological findings.
> Evaluating activities during safety stand-by.

This qualification will allow vertical and horizontal progression and mobility to obtain other qualifications and competencies. Achievement of the elective unit standards will allow for progression and career pathing into specialist areas. The qualification makes provision for movement between different sub-disciplines of radiation protection.

Rationale:

This qualification reflects the workplace-based and broader environmental needs of the radiation protection sector that are expressed by employers, employees and society at large for both current and future purposes. It allows learners employed in the radiation protection field to participate in further learning in the areas of implementation and maintenance of radiological control programmes, standards development, assessment and programme design, and to perform relevant roles in the broader radiation protection environment.

Target learners include mainly workers and supervisors in the radiation protection field, as well as waste

disposal workers, industrial radiographers, and everyone who wishes to pursue a career in radiation protection, health and safety and the physical sciences sectors. Competent learners will have a positive impact on members of the public who are protected against ionising radiation. Similarly learners achieving this qualification will contribute to the establishment and maintenance of radiologically safe workplaces and environments. It aims to enhance further learning in radiation protection and related fields, as well as providing for employment in the radiation protection field.

One of the most important needs for this qualification is to provide recognition of prior learning. Training is currently not provided against nationally recognised qualifications based on unit standards, which this qualification will be addressing. People with workplace experience in the areas covered by this qualification will now be allowed to request assessment and get recognition for prior learning. The qualification is internationally comparable and improved competence in this area will improve South Africa's ability to compete. Based on legal requirements for facilities, employees must be appointed to work in the area of radiation protection area and, therefore, by implication, appointment of qualified learners will ensure that they meet the requirements for competence.

Qualified learners are employed for implementing and developing radiation protection programmes and procedures in a work unit in consultation with, and with the assistance of, radiation protection managers or specialists where relevant. There are known health risks, as exposure to radiation is a known carcinogen causing cancers and illness. Environmental and political sensitivity is required and the sector is under environmental and political pressure to ensure good practice in terms of occupational health, safety and the environment. International standards are currently stricter in terms of allowable levels of radiation than in South Africa. Prior to the 1980s, the area of employment was closed to specific race groups. This qualification will improve access to employment and provide a formal qualification for competencies already mastered, with the resulting access to higher learning and career pathways.

The qualification is designed to:

> Provide qualified learners with an entry into the field of basic radiation protection.
> Prepare qualified learners for continued employment in the radiation protection industry.
> Allow the listed unit standards to be used in learnership schemes in the radiation protection sector, as well as other sectors where radiation protection is a key requirement.
> Provide a further qualification for people who are pursuing a career in the radiation protection fields.

RECOGNIZE PREVIOUS LEARNING3

Y

LEARNING ASSUMED TO BE IN PLACE

> Computer Literacy at NQF level 3.
> Communication at NQF Level 3.
> Mathematical Literacy at NQF Level 3.
> Selecting radiation and contaminant measurement instruments for specific contexts **(IDNo 119495).**

Recognition of prior learning

This qualification can be achieved wholly, or in part, through recognition of prior learning. Evidence can be presented in a variety of forms, including previous international or local qualifications, reports, testimonials, mentoring, functions performed, portfolios, work records and performance records. As such, evidence should be judged according to the general principles of assessment described in the notes to assessors below. Learners who have met the requirements of any Unit Standard that forms part of this qualification may apply for recognition of prior learning to the relevant Education and Training Quality Assurance body (ETQA). The applicant must be assessed against the specific outcomes and with the assessment criteria for the relevant Unit Standards. A qualification will be awarded should a learner demonstrate that the exit level outcomes of the qualification have been attained.

Access to the qualification

Qualified learners must be 18 years or older as per government regulation, and physically able to achieve the outcomes within specific contexts, that is, fit for the physical demands of radiation work, and they must meet any legislative requirements regarding physical fitness.

QUALIFICATION RULES

> All the Fundamental Component Unit Standards are compulsory (56 credits).

> All the Core Component Unit Standards are compulsory (50 credits).
> For the Elective Component learners are required *to* attain at least 14 credits out of the 114 credits.

EXIT LEVEL OUTCOMES

1. Determine safety precautions based on radiation protection rules, procedures and standards for a specific task or environment.
2. Assess and interpret radiological survey results and determine appropriate plan of action or procedures under routine and ad hoc/non-routine task conditions.
3. Ensure implementation of radiological safety compliance of a specific context/work unit (normal).
4. Supervise and evaluate radiological activities to ensure compliance (abnormal).
5. Record and report on radiological findings.
6. Supervise radiation protection team workers *to* achieve given work, quality and control objectives.

ASSOCIATED ASSESSMENT CRITERIA

1.
> Developed procedures and precautions are appropriate for the radiation safety of workers, the public and the environment.
> Developed procedures and precautions meet the prescribed rules, procedures, standards and requirements.
> Radiological hazards are correctly identified based on measurement results.
> Assessment of radiological hazard is appropriate for the extent of the measured hazard.
2.
> Developed procedures and precautions are aligned to radiation survey results.
> The appropriate actions taken are in accordance with local reference levels.
> Developed procedures and precautions are justified in terms of assessment and interpretation.
> **Results** are recorded, reported and communicated according *to* required specifications.
3.
> Procedures and/or plan of action are in place *to* enforce compliance.
> Occupational exposures are managed by means of given principles.
> Communication of safety information meet specified requirements.
> Surveillance requirements are communicated to relevant persons.
4.
> Precautions, measurements and advice are justified in terms of assessment and interpretation.
> Activities are stopped when required.
5.
> Reports are an accurate account of events, personnel exposures and conditions.
> Communication is clear and in required formats.
6.
> Objectives are communicated to all team members, feedback is obtained according to specified procedures and team member understanding is confirmed.
> Supervision meets both organisation and legal requirements.

Integrated assessment

The assessment criteria in the unit standards are performance-based, assessing applied competence, rather than only underpinning knowledge, or only skills. The critical cross-field outcomes are also achieved in the unit standards. In addition *to* the competence assessed to achieve the unit standards, learners must demonstrate that they can achieve the outcomes in an integrated manner, dealing effectively with different and random demands related to occupational and learning contexts, *to* qualify, and assessment approaches used should be appropriate for assessing applied competence. Integrated assessment is meaningful if there are clear relationships between the purpose statement, exit level outcomes and integrated assessment of this qualification.

Learners who qualify must be able to integrate concepts, ideas and behaviours across unit standards to achieve the purpose of the qualification. Evidence (as specified in the associated assessment criteria) is required that the learner is able to achieve the exit level outcomes of the qualification as a whole and in an integrated way, and thus its purpose, at the time of the award of the qualification.

Evidence of integration may be presented by learners when being assessed against the unit standards, and separate assessment for integration may not be necessary. Workplace experience can be recognised when assessing towards this qualification. Integrated assessment should include observable performance as well as the quality of thinking behind such performance. Formative assessment can be employed during learning towards the unit standards and during integration to achieve exit level outcomes, *to* ensure that integration

takes place when summative assessment is employed.

INTERNATIONAL COMPARABILITY

Internationally, training in radiation protection and the safe use of radiation sources distinguishes between different types and levels of learning. The International Atomic Energy Agency identifies eight types of learners: qualified experts, radiation protection officers, workers, qualified operators, health professionals, managers, staff of regulatory bodies and emergency response personnel. The equivalent of this qualification is radiation protection officers. The leading countries involved in radiation protection training are the United States of America (USA), Australia, the United Kingdom, Canada, France (often identified as the largest nuclear power generated electricity, with the most operating plants) and Germany. Best practice is considered to be the USA and Canada, with the largest number of radiation protection officers in the USA and the largest number of training programmes in the United Kingdom and the USA.

In Canada, most training programmes focus on Medical Radiation Technology. Similarly, the focus on the Australian framework is on Medical Radiation Science, and programmes are mostly at Higher Education level. France follows a behaviour-based intervention approach, referred *to* as 'auto protection', and training is not equivalent to this South African qualification. In Germany, The Federal Office for Radiation Protection (BfS) controls standards (information was not available in English).

In Africa, Ghana, Kenya, Zambia, Tanzania, and Nigeria are involved with radiation protection services and training. In Zambia, a radiation protection Diploma and Degree exists, both at a higher level than this qualification. Zambia also has a Radiation Protection Officer's Training Course, but information regarding this course was not available. Other African countries generally use the South African programmes.

Training in the USA is mostly focused at Higher Education level, in the form of continuing education, and most USA programs are University based. The courses address concepts such as atoms and nuclei, radiation, radiation units, biological effects of radiation, risk and protection, internal and external radiation protection, dose and exposures, contamination control, sampling, surveying and monitoring, handling and storage of radioactive materials, radioactive waste management, safety and contingency planning, record keeping and reporting. Most of these areas are addressed, albeit at a less complex level, in this South African qualification.

Training programmes in the USA at the equivalent level of this South African qualification generally include core academic, site academic and practical components. The National Registry of Radiation Protection Technologists conducts an exam for registration of Radiation Protection Technologists. This exam assesses competence in terms of the following, compared to the South African qualification:

> USA Examination: Applied Radiation Protection, RSA: Core.
> USA Examination: Survey and Inspections, RSA: Lower level.
> USA Examination: Emergency Preparedness, RSA: Higher level.
> USA Examination: Evaluating Internal and External Exposures and Controls, RSA: Core.
> USA Examination: Prescribed Dosimetry and Radiation Equipment, RSA: Core.
> USA Examination: Contamination Control, RSA: Core.
> USA Examination: Radioactive Material Control and Transportation, RSA: Lower level.
> USA Examination: Guides and Regulations, RSA: Core.
> USA Examination: Procedures and Programs (ALARA), RSA: Core.
> USA Examination: Detection and Measurement, RSA: Lower level.
> USA Examination: Analytical Methods, RSA: Core.
> USA Examination: Instrument Calibration and Maintenance, RSA: Elective.
> USA Examination: Personnel Dosimetry, RSA: Core.
> USA Examination: Equipment Operation, RSA: Lower level.
> USA Examination: Source of Radiation, RSA: Lower level.
> USA Examination: Biological Effects, RSA: Lower level.
> USA Examination: Mathematics, RSA: Fundamental.
> USA Examination: Chemistry, RSA: Lower level.
> USA Examination: Physics, RSA: Lower level.
> USA Examination: Units and Terminology, RSA: Core.

The National Regulator Commission (NRC) and the Department of Energy have published a qualification standard and model curriculum that includes the following, compared to this South African qualification:

> USA Qualification Standard: Perform simple mathematical calculations, RSA: Fundamental.
> USA Qualification Standard: Solve simple problems of physical science, RSA: Lower level.

> USA Qualification Standard: Describe the structure of the atom, RSA: Lower level.
> USA Qualification Standard: Explain the processes of fission and fusion, RSA: Lower level.
> USA Qualification Standard: Explain the ways an individual receives radiation, RSA: Lower level.
> USA Qualification Standard: Describe and measure radioactivity and radioactive decay, RSA: Lower level.
> USA Qualification Standard: Discuss the ways radiation interacts with matter, RSA: Lower level.
> USA Qualification Standard: Explain the biological effects of radiation, RSA: Lower level.
> USA Qualification Standard: Explain the radiological protection standards, RSA: Core.
> USA Qualification Standard: Determine ways to control external radiation exposure, RSA: Core.
> USA Qualification Standard: Determine ways to control internal radiation exposure, RSA: Core.
> USA Qualification Standard: Explain radiation detector theory, RSA: Lower level.
> USA Qualification Standard: Complete a performance test on a portable hand-held instrument, RSA: Lower level.
> USA Qualification Standard: Complete a performance test on health physics counting equipment, RSA: Lower level.
> USA Qualification Standard: Perform a loose surface contamination survey, RSA: Lower level.
> USA Qualification Standard: Perform a radiation survey, RSA: Lower level.
> USA Qualification Standard: Obtain and count air samples, RSA: Lower level.
> USA Qualification Standard: Perform a leak test on a radioactive source, RSA: Lower level.
> USA Qualification Standard: Post a radiological area to reflect associated hazards, RSA: Core.
> USA Qualification Standard: Perform a radioactive material shipment survey, RSA: Lower level.
> USA Qualification Standard: Respond to a high airborne activity alarm, RSA Higher level.
> USA Qualification Standard: Respond to an uncontrolled release of radioactive material, RSA: Higher level.
> USA Qualification Standard: Respond *to* an area high radiation alarm, RSA: Higher level.
> USA Qualification Standard: Respond to an injured person in a radiologically controlled area, RSA: Higher level.
> USA Qualification Standard: Direct and monitor personnel decontamination, RSA: Lower level.
> USA Qualification Standard: Perform monthly computations on total curies of radwaste received, RSA: Core.
> USA Qualification Standard: Don and remove protective respiratory equipment, RSA: Lower level.
> USA Qualification Standard: Don and remove protective clothing, RSA: Lower level.
> USA Qualification Standard: Correct for counting errors, RSA: Core.
> USA Qualification Standard: Explain the method of operation of each type of dosimetry, RSA: Lower level.
> USA Qualification Standard: Discuss and complete a Radiation Work Permit, RSA: Lower level.
> USA Qualification Standard: Explain how to maintain coverage in a radiologically controlled area, RSA: Core.
> USA Qualification Standard: Use proper methods of personnel decontamination, RSA: Lower level.
> USA Qualification Standard: Describe the instruments available to perform radiation surveys, RSA: Core.
> USA Qualification Standard: Describe the principles of operation of radiation detectors, RSA: Core.
> USA Qualification Standard: Describe the instruments available to monitor contamination, RSA: Core.
> USA Qualification Standard: Describe the equipment available to perform air sampling operations, RSA: Core.
> USA Qualification Standard: Describe the operation of the counting room instruments, RSA: Core.
> USA Qualification Standard: Use facility and federal radiological protection standards, RSA: Core.
> USA Qualification Standard: Explain ALARA and the methods used for implementation, RSA: Core.
> USA Qualification Standard: Discuss radiological considerations for first aid, RSA: Lower level.
> USA Qualification Standard: Explain how the Health Physics Department documents work, RSA: Core.
> USA Qualification Standard: Use onsite and offsite communications systems, RSA: Fundamental.
> USA Qualification Standard: Identify the major methods of contamination control, RSA: Core.
> USA Qualification Standard: Discuss implementation of the airborne radioactivity control program, RSA: Core.
> USA Qualification Standard: Discuss implementation of the facility respiratory protection plan, RSA: Core.
> USA Qualification Standard: Discuss the procedure for using and storing radioactive sources, RSA: Core.
> USA Qualification Standard: Discuss the facility environmental monitoring program, RSA: Higher level.
> USA Qualification Standard: Direct shipment/receipt of radioactive materials, RSA: Lower level.
> USA Qualification Standard: Explain facility and Health Physics response to an incident or emergency, RSA: Higher level.
> USA Qualification Standard: Emergency response to spill of toxic material, RSA: Higher level.
> USA Qualification Standard: Personnel responsible for facility safety, RSA: Lower level.
> USA Qualification Standard: Awareness of facility safety hazards, RSA: Core,
> USA Qualification Standard: Use of Personal Protective Equipment, RSA: Core.
> USA Qualification Standard: Work practices to minimize risk, RSA: Core.
> USA Qualification Standard: Engineering controls, RSA: Higher level.
> USA Qualification Standard: Symptoms of exposure, RSA: Lower level.

> USA Qualification Standard: Managing hazardous waste operations, RSA: Higher level.
> USA Qualification Standard: Procedure for handling facility emergency incidents, RSA: Higher level.
> USA Qualification Standard: Methods of detecting hazardous materials, RSA: Core.
> USA Qualification Standard: Hazards associated with use of facility chemicals, RSA: Core.
> USA Qualification Standard: Measures employees can use to protect themselves, RSA: Lower level.
> USA Qualification Standard: Details of Hazard Communications Program (Material Safety Data Sheet, etc.), RSA: Higher level.

All aspects in the USA qualification standard are covered, but at three different levels on the South African NQF. In terms of duration, the USA qualification is a two to three year programme. Also, the USA modules are said to be of equal duration (the equivalent of on average five South African NQF credits), whereas the South African unit standards have different weightings. Therefore, the duration of the USA programme components that are also included in this South African qualification, is the equivalent of between 100 and 150 credits.

In the United Kingdom two qualifications exist: one at a level below and one at a level above this South African qualification. The one-year Level 2 NVQ in Radiation Protection Support, placed in the sub-field of Engineering contains only Core units and is the equivalent of the NQF Level 3 National Certificate: Radiation Protection. The one-year Level 4 NVQ in Radiation Protection is registered at Higher Education level. It includes the following (Core only) units, compared to this South African qualification:

> United Kingdom: Promote a Positive Radiological Protection Culture, RSA: Core.
> United Kingdom: Contribute to the Development, Implementation and Maintenance of the Radiological Protection Policy, RSA: Core.
> United Kingdom: Identify and Evaluate Ionising Radiation Hazards, RSA: Core.
> United Kingdom: Assess Ionising Radiation Risks, RSA: Higher level.
> United Kingdom: Determine and Assist in the Implementation of Ionising Radiation Risk Control Measures, RSA: Core.
> United Kingdom: Develop and Assist with the Implementation of Inspection and Monitoring Systems and Procedures for Active Radiological Protection Performance Monitoring, RSA: Core.
> United Kingdom: Develop and Assist with the Implementation of Accident and Incident Systems and Procedures for Radiological Protection, RSA: Core.
> United Kingdom: Develop, and Assist with the Implementation and Test of, Contingency Plans for Dealing with a Release of Ionising Radiation, RSA: Higher level.
> United Kingdom: Develop and Assist with the Implementation of Review and Audit Systems for Radiological Protection, RSA: Higher level.

The South African qualification addresses more areas of competence than the United Kingdom qualification, although some areas are addressed only at a higher level on the South African NQF.

ARTICULATION OPTIONS

Vertical articulation is possible with the proposed: National Certificate: Radiation Protection (NQF Level 5).
> National Diploma: Nuclear Power Plant Process Control (NQF Level 5), ID No 23734.

Horizontal articulation on the NQF is possible with the:

> Further Education and Training Certificate: Human Resources Management and Practices Support, (NQF Level 4), ID No 49691.
> Further Education and Training certificate: Long-Term Risk Assessment (NQF Level **4),** ID No 49529.
> Further Education and Training Certificate: Road Transport Supervision (NQF Level 4), ID No 48439.
> National Certificate: in Nuclear Power Plant Operation (NQF Level 4), ID No 23733.
> National Certificate: Wastewater Process Control (NQF Level 4), ID No 22672.
> Further Education and Training Certificate: Clothing, Textiles, Footwear and Leather (CTFL) Mechanician Processes (NQF Level 4), ID No 48964.

MODERATION OPTIONS

Moderation of assessment and accreditation of providers shall be at the discretion of a relevant ETQA as long as it complies with the SAQA requirements. The ETQA is responsible for moderation of learner achievements of learners who meet the requirements of this qualification. Particular moderation and accreditation requirements are:

> Any institution offering learning that will enable the achievement of this qualification must be accredited as a provider with the relevant ETQA. Providers offering learning towards achievement of any of the unit

standards that make up this qualification must also be accredited through the relevant ETQA accredited by SAQA.
> The ETQA will oversee assessment and moderation of assessment according to their policies and guidelines for assessment and moderation, or in terms of agreements reached around assessment and moderation between the relevant ETQA and other ETQAs and in terms of the moderation guideline detailed here.
> Moderation must include both internal and external moderation of assessments for the qualification, unless the relevant ETQA policies specify otherwise. Moderation should also encompass achievement *of* the competence described in Unit Standards as well as the integrated competence described in the qualification.
> Internal moderation of assessment must take place at the point of assessment with external moderation provided by a relevant ETQA according to the moderation guidelines and the agreed ETQA procedures.
> Anyone wishing to be assessed against this qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

Assessment of learner achievements takes place at providers accredited by the relevant ETQA **(RSA,** 1998b) for the provision *of* programs that result in the outcomes specified for this qualification. Anyone assessing a learner of moderating the assessment of a learner against this qualification must be registered **as** an assessor with the ETQA. Assessors registered with the relevant ETQA must carry out the assessment of learners for the qualification and any of the Unit Standards that make up this qualification.

To register as an assessor, the following are required:

> Detailed documentary proof of relevant qualification/s, practical training completed, and/or experience gained in the relevant field at a NQF level above the level of this qualification.
> Detailed documentary proof of relevant qualification/s, practical training completed, and/or experience gained in assessment at the appropriate **NQF** level (credit against the registered unit standard).

Assessors should keep the following general principles in mind when designing and conducting assessments:

> Focus the initial assessment activities on gathering evidence in terms of the main outcomes expressed in the titles of the Unit Standards to ensure assessment is integrated rather than fragmented. The learner must be declared competent in terms of the qualification purpose and exit level outcomes.
> Where assessment across Unit Standard titles or at Unit Standard title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes. Take special note of the need for integrated assessment.
> Make sure evidence is gathered across the entire range, wherever it applies.

In particular, assessors should assess that the learner demonstrates an ability *to* consider a range of options by:

> Measuring the quality of the observed practical performance as well as the theory and underpinning knowledge.
> Using methods that are varied to allow the learner to display thinking and decision making in the demonstration of practical performance.
> Maintaining a balance between practical performance and theoretical assessment methods to ensure each is measured in accordance with the level of the qualification.
> Taking into account that the relationship between practical and theoretical components is not fixed, but varies according to the type and level of qualification.

All assessments should be conducted in line with the following well-documented principles:

> Appropriate: The method of assessment is suited to the performance being assessed.
> Fair: The method of assessment does not present any barriers to achievements, which are not related to the evidence.
> Manage: The methods used make for easily arranged cost-effective assessments that do not unduly interfere with learning.
> Integrate into work or learning: Evidence collection is integrated into the work or learning process where this is appropriate and feasible.
> Valid: The assessment focuses on the requirements laid down in the standards: i.e. the assessment is fit for purpose.
> Direct: The activities in the assessment mirror the conditions *of* actual performance as close as possible.

> Authentic: The assessor is satisfied that the work being assessed is attributable to the learner being assessed.
> Sufficient: The evidence collected establishes that all criteria have been met and that performance to the required Standard can be repeated consistently.
> Systematic: Planning and recording is sufficiently rigorous to ensure that assessment is fair.
> Open: Learners can contribute to the planning and accumulation of evidence. Learners *for* assessment understand the assessment process and the criteria that apply.
> Consistent: The same assessor would make the same judgement again in similar circumstances. The judgement made is similar than the judgement that would be made by other assessors.

NOTES

N/A

UNIT STANDARDS
(Note: A blank space after this line means that the qualification is not based on Unit Standards.)

	UNIT STANDARD ID AND TITLE	LEVEL	CREDITS	STATUS
C	10981 Supervise work unit to achieve work unit objectives (individuals and teams)	L 14	12	R gi: d
	11473 l ar individua and team e m nce	L 14	8	R gist d
core	118005 Investigate quality and control mechanisms in a business unit	Level 4	2	Registered
Core	123385 Manage radiological surveillance data	Level 4	5	Draft - Prep for P Comment
Core	123387 Control radiation protection resources	Level 4	3	Draft - Prep for P Comment
Core	123388 Control radiation protection processes	Level 4	10	Draft - Prep for P Comment
Core	123390 Interpret radiological surveillance data	Level 4	10	Drafl - Prep for P Comment
Elective	8970 Write texts for a range of communicative contexts	Level 3	5	Reregistered
Elective	116930 Use a Graphical User Interface (GUI)-based presentation application to enhance presentation appearance	Level 3	5	Registered
Elective	116936 Use a Graphical User Interface (GUI)-based database application to work with simple databases	Level 3	3	Registered
Elective	116940 Use a Graphical User Interface (GUI)-based spreadsheet application to solve a given problem	Level 3	6	Registered
Elective	116942 Use a GUI-based word processor to create merged documents	Level 3	3	Registered
Elective	119078 Use a GUI-based word processor to enhance a document through the use of tables and columns	Level 3	5	Registered
Elective	12066 Operate telemetric and electronic equipment and scientific insbumentation	Level 4	12	Reregistered
Elective	13705 Describe fundamental instrumentation and measurement equipment associated with nuclear power plant	Level 4	3	Registered
Elective	13727 Operate radioactive liquid waste treatment and handling systems	Level 4	17	Registered
Elective	13801 Operate radioactive gaseous waste handling systems	Level 4	3	Registered
Elective	14058 Describe insbumentation control within a process control system	Level 4	9	Registered
Elective	113849 Manage the transportation of waste	Level 4	6	Registered
Elective	116374 Monitor waste and record waste related statistics	Level 4	3	Registered
Elective	116943 Using a Graphical User Interface (GUI)-based spreadsheet application, enhance the functionality and apply graph/charts to a spreadsheet	Level 4	3	Registered
Elective	117927 Use a Graphical User Interface (GUI)-based database application to solve a given problem	Level 4	6	Registered
Elective	119239 Conduct radiographic testing	Level 4	8	Registered
Elective	123386 Calibrate radiation protection insbumentation	Level 4	14	Drafl - Prep for P Comment
Elective	123389 Analyse radioactive materials	Level 4	8	Drafl - Prep for P Comment
Fundamental	8968 Accommodate audience and context needs in oral communication	Level 3	5	Reregistered
Fundamental	8969 Interpret and use information from texts	Level 3	5	Reregistered
Fundamental	8973 Use language and communication in occupational learning programmes	Level 3	5	Reregistered
Fundamental	7468 Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues	Level 4	6	Reregistered
Fundamental	8974 Engage in sustained oral communication and evaluate spoken texts	Level 4	5	Reregistered

Fundamental	8975 Read analyse and respond to a variety of texts	Level 4	5	Reregistered
Fundamental	8978 Motivate judgements on selected literary texts	Level 4	5	Reregistered
Fundamental	9015 Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems	Level 4	6	Reregistered
Fundamental	9016 Represent analyse and calculate shape and motion in 2-and 3-dimensional space in different contexts	Level 4	4	Reregistered
Fundamental	12154 Apply comprehension skills to engage oral texts in a business environment	Level 4	5	Reregistered

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

SAQA US ID	*UNIT STANDARD TITLE*		
123385	Manage radiological surveillance data		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB for Radiation Protection		10	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Physical, Mathematical, Computer and Life Sciences	Physical Sciences
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	*5*	Level 4	Regular

SPECIFIC OUTCOME 1

Verify data against specified Quality Management System requirements.

SPECIFIC OUTCOME 2

Analyse radiological surveillance data for trends.

SPECIFIC OUTCOME 3

Organise data according to specified Quality Management System requirements.

SPECIFIC OUTCOME 4

Describe the implications of results for broader radiation protection contexts.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

SAQA US ID	UNIT STANDARD TITLE
123386	Calibrate radiation protection instrumentation

SGB NAME		ORGANISING FIELD ID	PROVIDER NAME
SGB for Radiation Protection		10	
UNIT STANDARD TYPE		**ORGANISING FIELD DESCRIPTION**	**SUBFIELD DESCRIPTION**
Regular		Physical, Mathematical, Computer and Life Sciences	Physical Sciences
ABET BAND	**CREDITS**	**NQF LEVEL**	**UNIT STANDARD TYPE**
Undefined	14	Level 4	Regular

SPECIFIC OUTCOME 1

Determine calibration requirements for specific instruments.

SPECIFIC OUTCOME 2

Select calibration equipment for speciftc instruments.

SPECIFIC OUTCOME 3

Obtain calibration results for specific instruments.

SPECIFIC OUTCOME 4

Maintain calibration equipment.

SAQA

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Control radiation protection resources

SAQA US ID	UNIT STANDARD TITLE
123387	Control radiation protection resources

SGB NAME		ORGANISING FIELD ID	PROVIDER NAME
SGB for Radiation Protection		10	
UNIT STANDARD TYPE		**ORGANISING FIELD DESCRIPTION**	**SUBFIELD DESCRIPTION**
Regular		Physical, Mathematical, Computer and Life Sciences	Physical Sciences
ABET BAND	**CREDITS**	**NQF LEVEL**	**UNIT STANDARD TYPE**
Undefined	3	Level 4	Regular

SPECIFIC OUTCOME 1

Design systems to verify that routine instrumentation checks are conducted.

SPECIFIC OUTCOME 2

Assign required surveillance programme activities to relevant persons.

SPECIFIC OUTCOME 3

Allocate personnel monitoring equipment according to specified requirements.

SPECIFIC OUTCOME 4

Maintain personal protective clothing and equipment according to specified requirements.

SPECIFIC OUTCOME 5

Maintain sampling materials stock at adequate levels.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Control radiation protection processes

SAQA US ID	*UNIT STANDARD TITLE*
123388	Control radiation protection processes

SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB for Radiation Protection		10	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Physical, Mathematical, Computer and Life Sciences	Physical Sciences
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	10	Level 4	Regular

SPECIFIC OUTCOME 1

Schedule radiation protection processes optimally.

SPECIFIC OUTCOME 2

Verify that radiation protection processes meet programme requirements,

SPECIFIC OUTCOME 3

Review standard task procedures to provide for radiation protection requirements.

SPECIFIC OUTCOME 4

Interpret given radiation protection requirements for specific contexts.

SPECIFIC OUTCOME 5

Prescribe radiation protection precautions for radiological tasks.

SAQA

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Analyse radioactive materials

SAQA US ID	*UNIT STANDARD TITLE*		
123389	Analyse radioactive materials		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB for Radiation Protection		10	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Physical, Mathematical, Computer and Life Sciences	Physical Sciences
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	8	Level 4	Regular

SPECIFIC OUTCOME 1

Obtain samples of materials relevant *for* specific contexts.

SPECIFIC OUTCOME 2

Evaluate radioactive material samples against specific criteria.

SPECIFIC OUTCOME 3

Document results according to given specifications.

SPECIFIC OUTCOME 4

Recommend action based on sample material analysis.

SAQA

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Interpret radiological surveillance data

SAQA US ID	*UNIT STANDARD TITLE*		
123390	Interpret radiological surveillance data		
SGB NAME		*ORGANISING FIELD ID*	*PROVIDER NAME*
SGB for Radiation Protection		10	
UNIT STANDARD TYPE		*ORGANISING FIELD DESCRIPTION*	*SUBFIELD DESCRIPTION*
Regular		Physical, Mathematical, Computer and Life Sciences	Physical Sciences
ABET BAND	*CREDITS*	*NQF LEVEL*	*UNIT STANDARD TYPE*
Undefined	10	Level 4	Regular

SPECIFIC OUTCOME 1

Assess data in terms of measurement quality criteria.

SPECIFIC OUTCOME 2

Assess physical extent of hazards according to specified procedures.

SPECIFIC OUTCOME 3

Evaluate compliance with specified reference and/or classification levels.

SPECIFIC OUTCOME 4

Recommend action based on reference and/or classification levels.