



NQC UAE NATIONAL QUALIFICATION/AWARD

For use by developers of UAE national qualifications based on national occupational standards (Q+NOS)

1. General Profile of Qualification

1.1	Title	Level 4 Award for Radiation Occupationally Exposed Workers - Tier 1			
1.2	Code	EGY04002NQ23			
1.3	Type	<input type="checkbox"/> Principal Qualification		<input checked="" type="checkbox"/> Award	
1.4	Credit and duration	Credit value	1 credits	Duration	15 hours
1.5	QF Emirates Level	Level 4			
1.6	Aim	This award aims to provide Learners with the basic knowledge, skills and competencies to safely perform work activities in the presence of ionizing radiation in facilities characterized by lowest radiological risks, ensuring that best Radiation Protection practices are maintained.			
1.7	Qualification outcomes	Upon successful completion of this award, learners will be able to:			
		QO01	Demonstrate relevant knowledge and application of work policies, procedures and instructions related to Radiation Protection in facilities characterized by lowest radiological risks		
		QO02	Demonstrate knowledge of ionizing radiation risk identification and control in facilities characterized by lowest radiological risks		
		QO03	Demonstrate ability to select and use personal protective equipment against ionizing radiation in facilities characterized by lowest radiological risks		
1.8	Functions	<input type="checkbox"/> Policy and strategy	QF 9-10	<input type="checkbox"/> Controlling	QF 6
		<input type="checkbox"/> Managing	QF 7-8	<input checked="" type="checkbox"/> Maintaining capability	QF 4-6
		<input type="checkbox"/> Specifying	QF 6-7	<input type="checkbox"/> Performing/carry out	QF 1-4
1.9	Pathways/progression into other qualifications (if any)	Successful Candidates may progress and obtain the Level 4 Award for Radiation Occupationally Exposed Workers - Tier 2.			
1.10	Licensing/regulatory requirements (if any)	Not applicable			

2. Occupation and industry sector

2.1	ISCO title and code	Occupation title	Protective services workers not elsewhere classified
		4-digit ISCO code	5419
2.2	Industry sector	Sector	Energy resources - oil, natural gas, petrochemical, chemical and mining/quarrying
		Sub-sector	Other (Energy)

3. Entry requirements for this qualification

Document Title	Version	Date	Owner	Page
Qualification Details	NQC	7/18/2023	NQC	1



3.1	Minimum requirements (if any)	Qualification(s) required for entry	Grade 11 education.
		Other minimum requirements e.g. competence, experience	Candidates should already be employed in a sector in which work activity in the course of radiation emergencies is likely, or be students or trainees in nuclear or radiological sciences. Basic English language literacy. Basic computational abilities.
3.2	Advisory requirements (if any)	Recommended requirements	It is recommended that medical fitness to work in a radiation emergency environment be obtained prior to work assignment.
			Grade 12 education.

4. Rules of combination

4.1 The learner must successfully complete the following minimum number of credits

Unit type	Min. Credits	Guidance on the rules of combination (if any)
Core	1	

4.2 Core unit standards

Title	Code (NQC to enter)	QF level	Credit value
Execute work activities in the presence of ionizing radiation sources in facilities characterized by lowest radiological risks – Exposed Worker Tier 1	EGY04005NU23	Level 4	1
Total number of credits from <u>core</u> unit standards to be completed			1

4.3 Stream unit standards

Title	Code (NQC to enter)	QF level	Credit value

4.4 Optional unit standards

Title	Code (NQC to enter)	QF level	Credit value

Document Title	Version	Date	Owner	Page
Qualification Details	NQC	7/18/2023	NQC	2



5. Assessment advice

The assessment advice for the qualification to guide learners, assessors and verifiers must consider evidence requirements in NOS unit standards and summarise the main assessment approach and methods for the qualification that will ensure learners meet the qualification learning outcomes. (Note: Trainers, assessors, internal verifiers and external verifiers for this qualification must be occupationally competent in the occupational field of the qualification).

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Assessment must be conducted in an environment where evidence gathered demonstrates consistent performance.

Learners must demonstrate consistent performance in conditions that are safe and replicate a potential workplace.

Assessment methods can include:

- Scenario setting
- Presentations
- Virtual simulations (or role plays) and modelling
- Written material and reports, including authenticated evidence from workplace and/or training courses
- Checklists and comparative charts
- Statements
- Evidence of written reports summarising results of candidate skills assessment
- Oral or written questioning

Evidence:

- Verbal or written questioning to assess candidate's knowledge
- Summative assessment to ensure consistency of performance in a range of contexts
- Formative evidence for this unit can be written, oral or diagrammatic
- Formative evidence ought to assist learners to learn and increase performance
- Summative assessment is based on real live work situations or simulated situations

Assessors and verifiers must satisfy NQC/VETAC requirements with subject matter expert related to radiation protection assessments.

All evidence submitted by the learner must be verified and documented by the assessor for future evaluation purpose.

Summative assessment is based on real live work situations or simulated situations.

Assessment judgements are based on evidence that is documented valid, authentic, current, and sufficient, and are consistent with previous judgements made on similar evidence.

Re-submissions are permissible

Document Title	Version	Date	Owner	Page
Qualification Details	NQC	7/18/2023	NQC	3



6. Glossary

Term	Definition
Occupationally Exposed Worker - Tier 1	Workers exposed to ionizing radiation during the course of their work (and whose potential doses may exceed that of the general population), in facilities characterized by lowest radiological risks (or during transport of radioactive materials), across all Sectors (industrial, research, medical, etc.). They should be trained in general radiation protection and have a basic, broad understanding of radiological risks and radiation detection.
Occupationally Exposed Worker - Tier 2 Stream A (medical)	Workers exposed to ionizing radiation during the course of their work in medical facilities characterized by intermediate radiological risks (or during transport of radioactive materials), which may also include risks from radioactive contamination. Facilities may include CT scanner, PET, SPECT, nuclear medicine departments, etc. Workers should be trained in general radiation protection topics, including risks of contamination and its prevention, and have an intermediate, broad understanding of radiological risks and radiation detection in medical facilities.
Occupationally Exposed Worker - Tier 2 Stream B (non-medical)	Workers exposed to ionizing radiation during the course of their work in non-medical facilities characterized by intermediate radiological risks (or during transport of radioactive materials), which may also include risks from radioactive contamination. Workers should be trained in general radiation protection topics, including risks of contamination and its prevention, and have an intermediate, broad understanding of radiological risks and radiation detection in non-medical facilities.
Occupationally Exposed Worker - Tier 3 - Stream A (medical)	Workers exposed to ionizing radiation during the course of their work in medical facilities characterized by highest radiological risks (or during transport of highly irradiating radioactive materials), which may also include risks from neutron sources. Facilities include radiotherapy departments, BNCP, alpha-immunotherapy, etc. Workers should be trained in most radiation protection topics, including risks arising from neutron sources, and have an advanced, broad understanding of radiological risks and radiation detection in most complex medical facilities.
Occupationally Exposed Worker - Tier 3 - Stream B (industrial)	Workers exposed to ionizing radiation during the course of their work in industrial facilities (non-medical and non-nuclear), characterized by highest radiological risks (or during transport of highly irradiating radioactive materials), which may also include risks from neutron sources. Facilities include food and commodities irradiation centres, NDA services, accelerators, neutron sources and gauges, etc. Workers should be trained in most radiation protection topics, including risks arising from neutron sources, and have an advanced, broad understanding of radiological risks and radiation detection in most complex non-medical, non-nuclear facilities.

Document Title	Version	Date	Owner	Page
Qualification Details	NQC	7/18/2023	NQC	4



Occupationally Exposed Worker - Tier 3 - Stream C (nuclear)	<p>Workers exposed to ionizing radiation during the course of their work in nuclear facilities (or during transport of nuclear materials), including risks from neutron sources.</p> <p>Facilities include fuel fabrication facilities, nuclear reactors, high activity fuel storage, etc.</p> <p>Workers should be trained in most radiation protection topics, including risks arising from neutron sources, and have a more advanced, broad understanding of radiological risks and radiation detection in nuclear facilities.</p>
FANR Safety, Security, and Safeguards Glossary	<p>FANR Safety, Security, and Safeguards Glossary aims to provide with a comprehensive compilation of all the terms included in the Federal Law by Decree No.6 of 2009 Concerning the Peaceful Uses of Nuclear Energy (the Nuclear Law) , the Federal Law by Decree No.4 of 2012 Concerning Civil Liability for Nuclear Damage, FANR regulations and FANR regulatory guides and their respective definitions.</p> <p>The 2021 Edition of the FANR Glossary is an updated version of the initial Glossary issued in 2011 and reflects the updates in the legislative and regulatory framework of FANR. This document is developed for information purposes only, the official and authentic definitions being the ones contained in the laws, FANR regulations and regulatory guides as available on the FANR website.</p> <p>https://www.fanr.gov.ae/en/open-data/fnar-glossary (in English) https://www.fanr.gov.ae/ar/open-data/fnar-glossary (in Arabic)</p>

7. Developer details

7.1 Organisation(s)	Radiation Protection RNDC
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8. Key dates

8.1	Endorsement date	01/06/2023
8.2	Review date	31/05/2028



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EGYN23

Document Title	Version	Date	Owner	Page
Qualification Details	NQC	7/18/2023	NQC	5



NQC UAE-NOS TEMPLATE

For use by developers of UAE national occupational standards (UAE-NOS) packaged as unit standards

1.	Title	Execute work activities in the presence of ionizing radiation sources in facilities characterized by lowest radiological risks – Exposed Worker Tier 1			
2.	Code	EGY04005NU23			
3.	Credit and duration	3a) Credit value	1	3b) Duration	15
4.	Aim	This unit aims to provide Exposed Workers with the basic knowledge of radiation physics and radiation protection, and the basic skills to operate effectively with ionizing radiation sources in facilities characterized by lowest radiological risks (or during transport of radioactive materials), across all Sectors (industrial, research, medical, etc.).			
5.	Learning outcomes	At the end of this unit, learners will be able to:			
		LO01	Demonstrate relevant knowledge and application of work policies, procedures and instructions related to Radiation Protection in facilities characterized by lowest radiological risks		
		LO02	Demonstrate knowledge of ionizing radiation risk identification and control in facilities characterized by lowest radiological risks		
		LO03	Demonstrate ability to select and use personal protective equipment against ionizing radiation in facilities characterized by lowest radiological risks		
6.	QF <i>Emirates</i> Level	Level 4			
7.	Outcomes, performance criteria, and evidence requirements				

Outcome 1 LO01

Performance criteria

PC01	Demonstrate knowledge and understanding of basic radiation physics, namely the basic structure of an atom, including its three primary components
PC02	Explain the following: Alpha radiation Beta radiation Gamma radiation X-ray radiation Radioactive decay Half-life Fission
PC03	State and explain the three Radiation Protection Principles (justification, optimization and limitation)
PC04	Describe the second Radiation Protection Principle: "As Low As Reasonably Achievable" (ALARA)
PC05	Describe the third Radiation Protection Principle and state regulatory dose limits in the UAE
PC06	Describe the three main techniques for mitigating external exposure hazards
PC07	Describe techniques to avoiding or mitigating internal exposure hazards

Document Title	Version	Date	Owner	Page
Qualification Details	NQC	7/18/2023	NQC	6



PC08	Describe basic Radiation Protection precautions when operating (or working in close proximity with) x-ray equipment, or low activity, sealed gamma-emitting radioactive sources (calibration sources)
PC09	Identify and describe local warning systems, radiation protection signs and symbols in the working environment
PC10	Define "Supervised Area" and "Controlled Area", and state generic local rules for such areas in the UAE
PC11	State the main Radiation Protection precautions to be applied in handling, use, storage and transportation of radiation sources
PC12	Explain the basic concepts of emergency response and the Workers' role during a radiological emergency

Specific evidence requirements

Candidates must demonstrate knowledge and understanding of the basic principles of radiation physics plus demonstrate relevant knowledge and application of Radiation Protection precautions when operating or working in close proximity with X-ray equipment and low-activity sealed radioactive sources; knowledge and understanding of local warning systems, signs and symbols regarding radiation protection in the working environment; and explain their role in a radiation emergency.

The following information is provided to aid the training provider in developing the course work:

PC1.06: Time, Distance, Shielding

PC1.08: e.g. diagnostic x-ray, baggage x-ray inspection machines, mobile x-ray generators

Outcome 2 LO02

Performance criteria

PC01	Explain the fundamentals of radiation risk assessments
PC02	Describe sources of radiation exposure during work activities in the specific work environment, and their associated radiological risks
PC03	Describe methods for measuring radiation dose rate
PC04	Explain biological effects of exposure to ionizing radiation
PC05	State applicable FANR Regulations and annual dose limits for workers and the population

Specific evidence requirements

Document Title	Version	Date	Owner	Page
Qualification Details	NQC	7/18/2023	NQC	7



Candidate must demonstrate knowledge and understanding of basic principles of radiation risk identification and control, the concept of ALARA, and the potential sources/effects of exposure to ionizing radiation. Candidates must have some notions of the applicable Radiation Protection Regulations in the UAE, and must be familiar with annual dose limits to Workers and to the population.

The following information is provided to aid the training provider in developing the course work
 PC2.01: identify radiation sources; evaluate dose rates and contaminations levels; decide who/what may be harmed and how; decide on precautions and implement them; review assessments and update if required. It includes the description of three examples of different workplace radiation risk assessment to aid understanding.
 PC2.04: includes: tissue reactions and dose thresholds; stochastic effects and their potential outcome; potential risks to an embryo or foetus
 PC2.05: state dose limits for workers and the general public and reference levels in emergency situations

Outcome 3 | **LO03**

Performance criteria

PC01	Describe various personal protective equipment used in work activities in presence of ionizing radiation
PC02	Demonstrate the ability to correctly don, use and doff personal protective equipment (PPE) in normal operating conditions
PC03	Explain the function, types, and use of personal dosimeters
PC04	Identify the various types of personal protective equipment -including respiratory protective equipment- that may be available in emergency situations

Specific evidence requirements

Candidate must demonstrate knowledge and understanding of selecting personal protective equipment against ionizing radiation according to the situations, and wearing it appropriately.

The following information is provided to aid the training provider in developing the course work
 PC3.03: this also includes electronic dosimeters.

8.	Range statement	This Unit may be assessed in a simulated environment under conditions that safely replicate relevant workplace situations
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Document Title	Version	Date	Owner	Page
Qualification Details	NQC	7/18/2023	NQC	8



9.	Assessment advice	<p>Assessment must be conducted in an environment where evidence gathered by Learners demonstrates consistent performance in conditions that are safe and replicate a potential workplace environment.</p> <p>Assessment methods can include:</p> <ul style="list-style-type: none"> • Scenario setting • Presentations • Virtual simulations and modelling • Written material and report • Checklists and comparative charts • Statements • Topologies • Evidence of written reports summarising results of candidate skills assessment • Oral or written questioning <p>Evidence:</p> <ul style="list-style-type: none"> • Verbal or written questioning to assess candidate’s knowledge • Summative assessment to ensure consistency of performance in a range of contexts • Formative evidence for this unit can be written, oral or diagrammatic • Formative evidence ought to assist learners to learn and increase performance • Summative assessment is based on real live work situations or simulated situations <p>Assessors and verifiers must satisfy NQC/VETAC requirements with subject matter expert related to radiation emergency assessment.</p> <p>All evidence submitted by the learner must be verified and documented by the assessor for future evaluation purpose.</p> <p>Summative assessment is based on real work situations or simulated situations.</p> <p>Assessment judgements are based on evidence that is documented as valid, authentic, current, and sufficient, and are consistent with previous judgements made on similar evidence.</p> <p>Re-submissions are permissible</p>		
10.	Entry requirements	10a) Mandatory	None	
		10b) Advisory	None	
11.	Grading	Percentile 100%: ____%		
		80% pass mark		

Document Title	Version	Date	Owner	Page
Qualification Details	NQC	7/18/2023	NQC	9



12.	Resources required	<p>Reference materials related to this unit, for consideration, and which correlate with international nuclear industry acceptance, for working in a workplace environment include:</p> <p>relevant and contemporary reference documents, manuals, instructions, procedures, standards;</p> <p>relevant industry policies and organizational procedures</p> <p>Other reference documents, including:</p> <p>Basic Safety Standards for Facilities and Activities involving Ionizing Radiation other than in Nuclear Facilities (FANR-REG-24)</p> <p>IAEA Safety Standards Series, Building Competence in Radiation Protection and the Safe Use of Radiation Sources, No. RS-G-1.4</p>	
13.	Relevant CoreLife Skills	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Collecting, analysing, organising and applying information in a given context <input checked="" type="checkbox"/> Communicating information, concepts and ideas <input checked="" type="checkbox"/> Initiating and organising self and activities incl. motivation, exploration and creativity <input checked="" type="checkbox"/> Working with others in teams incl. leadership <input checked="" type="checkbox"/> Solving problems incl. using mathematical ideas and techniques <input type="checkbox"/> Applying information and communication technology (ICT) <input type="checkbox"/> Participating in social and civic life incl. ethical practice 	
14.	Industry sector	14a) Sector	Energy resources - oil, natural gas, petrochemical, chemical and mining/quarrying
		14b) Sub-sector	Other (Energy)
15.	Developing organisation	RNDC in Radiation Protection	
16.	Approval date	01/06/2023	
17.	Review date	31/05/2028	



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EGYN23

Document Title	Version	Date	Owner	Page
Qualification Details	NQC	7/18/2023	NQC	10