GOVERNMENT NOTICES

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

No. 1090 **17 October 2008**

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

Aerospace Operations

registered by Organising Field 10 – Physical, Mathematical, Computer and Life Sciences, publishes the following 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 full 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, SAQA House, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the Qualification and Unit Standards should reach SAQA at the address below and ***no later than 17 November 2008.*** All correspondence should be marked **Standards Setting – SGB for Aerospace Operations** and addressed to

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ACTING DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:
National Diploma: Communication and Navigation Systems

SAQA QUAL ID	*QUALIFICATION TITLE*		
64089	National Diploma: Communication and Navigation Systems		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
QUALIFICATION TYPE	*FIELD*	*SUBFIELD*	
National Diploma	10 - Physical, Mathematical, Computer and Life Sciences	Physical Sciences	
ABET BAND	*MINIMUM CREDITS*	*NQF LEVEL*	*QUAL CLASS*
Undefined	262	Level 6	Regular-Unit Stds Based

This qualification does not replace any other qualification and is not replaced by another qualification.

PURPOSE AND RATIONALE OF THE QUALIFICATION
Purpose:

The combination of learning outcomes that comprise this Qualification will provide the qualifying learner with vocational knowledge and skills appropriate to the context of Air Traffic Management Technical Support Services. It will also equip learners with a foundation for further intellectual development, opportunities for gainful employment and reward for contributions to society.

The learner assessed as competent against this qualification will be able to:

> Support and Maintain Radio Navigation Systems.
> Support and Maintain Radio Communication Systems.
> Support and Maintain Telecommunications Systems.

This Qualification will provide the Air Traffic Management profession with qualified Air Traffic Management Technical Support Personnel, thereby facilitating social and economic transformation, empowerment, and upliftment in the Industry and country in general.

Rationale:

There is an urgent need to provide recognition to people who are able to conduct the essential operations associated with safe and efficient aviation communication, navigation and surveillance.

The focus of this qualification will be mainly on technical personnel who have been working within the Aviation Industry in Air Traffic Management (ATM) or for persons with relevant aviation skills, knowledge and experience who wish to pursue a career in ATM technical support.

In the past many practitioners in the Air Traffic Management technical support area were denied career advancement and possible professional registration. The introduction of a unit standard based National Diploma in Communications and Navigation Systems, will allow learners, mainly

employed in the field for a long time, recognition for their knowledge and acquired competencies through the process of RPL. It will also allow them advancement in their professional careers through transfer of credits gained, to whatever further learning they wish to carry out in their related aviation fields.

This qualification will facilitate the development of a professional community of Air Traffic Management Technical Personnel who are able to contribute towards a safe and productive technical support environment through the application of enhanced knowledge and skills relating to the installation, operation, maintenance and technical support of Communications and Navigation Systems used within the Air Traffic Management environment.

The combination of learning outcomes will provide the qualifying learner with applied competence in the provision of technical support for Communications Systems and Radio. Navigation Aids used in the Aviation Environment. This qualification lays down the basis for further learning towards a proposed NQF Level 7 Diploma in ATM Systems Engineering.

RECOGNIZE PREVIOUS LEARNING?
Y

LEARNING ASSUMED IN PLACE
It is assumed that learners are competent in:

> Communication at NQF Level 4 or equivalent.
> Knowledge of Navigation and Surveillance Support.

Recognition of Prior Learning:

This Qualification and all the Fundamental, Core and Elective Unit Standards associated with it, as described in the rules of combination, can be achieved by any learner through the recognition of prior learning, which includes learning outcomes achieved through formal, informal and non-formal learning and work experience. The Exit-Level Outcomes and the related Unit Standards may also be achieved through the recognition of prior learning.

Access to the Qualification:

There are no access limitations on any learners or classes of learners for this qualification.

QUALIFICATION RULES
The qualifying learner will achieve this Qualification by complying with the following rules of combination for the accumulation of credits:

Learning Component; Credits:

> All fundamental Unit Standards; 25 Credits.
> All Core Unit Standards; 217 Credits.
> Elective Unit Standards (minimum); 20 Credits.

Total Credits = 262 Credits.

EXIT LEVEL OUTCOMES
1. Apply technical knowledge of Radio Navigation Systems to operate, monitor and restore related equipment according to technical instructions.
> Range: Radio Navigation Systems include but are not limited to: Very High Frequency Omni-directional Range (VOR) Systems, Distance Measuring Equipment (DME) Systems, Very High Frequency Direction Finding Equipment (VDF), Non Directional Radio Beacons (NDB) and Instrument Landing Systems (ILS).

> Range: Technical knowledge of aspects related to Radio Navigation Systems includes, but is not limited to: Aerial Systems, Transmitter Systems, Receiver Systems, Radiated and received signals, System Architecture, Monitoring, Use, HMI, Measurements and Signal Processing.

2. Apply technical knowledge of Radio Communication Systems to operate, monitor and restore related equipment according to technical instructions.
> Range: Radio Communications Systems includes, but is not limited to: Very High Frequency Systems, Voice Communication Control Systems and High Frequency Systems.
> Range: Technical knowledge of aspects related to Radio Communications Systems includes, but is not limited to: Aerial Systems, Transmitter Systems, Receiver Systems, Radiated and received signals, System architecture, Monitoring, HMI, Measurements and Signal Processing.

3. Apply technical knowledge of Telecommunication Systems to operate, monitor and restore related equipment according to technical instructions.
> Range: Technical instructions include, but are not limited to: Manufacturer's technical manual, Quality management system procedures, ICAO recommendations and Organisational operational requirements.

ASSOCIATED ASSESSMENT CRITERIA
Associated Assessment Criteria for Exit-Level-Outcome 1:

1.1 Radio navigation systems and architecture is explained in terms of its purpose and functionality.
1.2 Routine preventative maintenance is performed using appropriate test equipment according to manufacturer's specifications.
1.3 Remote and on-site corrective action is conducted according to corrective maintenance procedures.
1.4 The performance of the radio navigation systems is measured and analysed to support the Flight Calibration team in accordance with aviation legislative requirements.

Associated Assessment Criteria for Exit-Level-Outcome 2:

2.1 Radio communication systems and architecture is explained in terms of its purpose and functionality.
2.2 Routine preventative maintenance is performed using appropriate test equipment according to manufacturer's specifications.
2.3 Remote and on-site corrective action is conducted according to corrective maintenance procedures.
2.4 The performance of radio communication systems are measured, analysed and monitored in accordance with aviation legislative requirements.
2.5 Stress management strategies are implemented to optimise the provision of engineering support and maintenance services for aeronautical Communication and Navigation Systems.

Associated Assessment Criteria for Exit-Level-Outcome 3:

3.1 Telecommunication systems and architecture is described and explained in terms of its purpose and functionality.
3.2 Routine preventative maintenance is performed using appropriate test equipment according to manufacturer's specifications.
3.3 Corrective fault diagnosis and corrective action is conducted in terms of corrective maintenance procedures.
3.4 The performance of telecommunication systems is measured, analysed and monitored in accordance with aviation legislative requirements.

Integrated Assessment:

Integrated assessment at the level of the qualification provides an opportunity for learners to show that they are able to integrate concepts, ideas and actions across unit standards to achieve competence that is grounded and coherent in relation to the purpose of the qualification. Integrated assessment should show how already demonstrated competence in individual areas can be linked and applied for the achievement of a holistic outcome as described in the exit level outcomes.

Integrated assessment must judge the quality of the observable performance, and also the quality of the thinking that lies behind it. Assessment tools must encourage learners to give an account of the thinking and decision-making that underpin their demonstrated performance. Some assessment practices will demand practical evidence while others may be more theoretical, depending on the type of outcomes to be assessed. The ratio between action and interpretation is not fixed, but varies according to the demands of the particular exit level outcome of the qualification.

While the generic components of this qualification at NQF Level 6 can be assessed through occupational contexts and activities relating to Air Traffic Management, care must be taken in both the learning programme and the assessment to ensure that these foundational skills are portable. The primary aim of this qualification is to ensure that learners have a sound general foundation to prepare them for further learning towards a specialised role in their chosen career path. Learners must be able to transfer generic skills across a number of different contexts, and apply them within a number of learning areas.

A broad range of task-orientated and theoretical assessment tools may be used, with the distinction between practical knowledge and disciplinary knowledge maintained so that each takes its rightful place.

INTERNATIONAL COMPARABILITY

The institutions responsible for the education and training of engineering personnel in the aviation industry of many countries contacted were unwilling to share information that would assist in making a comparison with this National Diploma in Surveillance Systems: Engineering Support.

Countries and institutions that were included in the search for similar qualifications are:

> United States (Federal Aviation Association).
> Canada (NAV Canada).
> Tanzania Civil Aviation Authority.
> Airports Authority of India.
> Air Services Australia.
> Airways New Zealand.
> Brazilian Airports.
> Egypt Ministry of Civil Aviation.
> Singapore Aviation Academy.
> Eurocontrol (European Union).
> International Federation of Air Traffic Safety Electronic Personnel.

Useful and usable information was obtained from "Eurocontrol" and "International Federation of Air Traffic Safety Electronic Personnel" (IFATSEA). The guidance material for technical training as obtained from these two institutions is described below.

Eurocontrol:

EUROCONTROL is the European Organisation for the Safety of Air Navigation. Created in 1963 by six founding members, this civil and military intergovernmental organisation now counts 38 Member States from across Europe. It is based in Belgium with specialised offices in six other

European countries. The member countries include: Austria, Belarus, Belgium, Denmark, France, Germany, Italy, Latvia, Lithuania, Malta, Netherlands, Norway, Poland, Russian Federation, Slovakia, Spain, Sweden, Switzerland, Ukraine, United Kingdom, Bosnia and Herzegovina, Serbia and Montenegro, Cyprus, Estonia and Romania.

It is widely accepted that this career pathway of Engineering Support in the aviation industry comprises four learning areas, namely: Communication Systems, Navigation Systems, Display Systems and Radar Systems.

The European Organization for Safety in Air Navigation under its sub-division "European Air Traffic Management" has developed guidelines for a common qualification level for Technical Training for Air traffic Safety Electronics Personnel.

These guidelines refer to the following progression table for training of technical personnel:

> Basic Training.
> Qualification Training.
> Type Rating.
> Continuation Training or Refresher Training.
> Development Training.

The "basic training" level compares closely in terms of the learning areas with the registered National Certificate in Communication, Navigation and Surveillance Support, Level 5 (SAQA ID: 57229).

The "qualification training" and "type rating" training compares closely with the two National Diplomas in Communication and Navigation Systems and Surveillance Systems. The difference is that the "Type Rating" training focuses on only one of the four disciplines while each of the South African diplomas provides for two disciplines namely Communication and Navigation Systems in the one diploma and Surveillance (Radar and Display) Systems in the other diploma.

Furthermore, "Data Processing" is treated as a separate discipline in the Eurocontrol approach, while the South African approach is that it is a common thread that features in both the diplomas because data processing is viewed as being embedded in all aviation equipment.

The credit value for the European training of aviation technicians was not available for a direct comparison with the South African qualifications comprising this career pathway. The duration of the contact component of the European training compares closely with the South African diplomas.

The table below reflects the comparison described above:

South African National Diplomas:

European Air Traffic Management/IFATSEA:

> Advanced Diploma in ATM Engineering (Proposed) NQF Level 7; Continuation training and Development training.
> National Diploma in Communication and Navigation Systems (NQF Level 6) (269 Credits); Type Rate Training in only one discipline i.e. Surveillance or Data Processing (Credits unknown); Qualification Training in Surveillance and Data Processing (124 credits).
> National Certificate in CNS support (NQF Level 5) (161 Credits) [SAQA ID: 57229]; Common Basic Level Training (approximately 150 to 170 Credits).

International Federation of Air Traffic Safety Electronic Personnel (IFATSEA):

IFATSEA was founded in October 1972 by 11 countries, today member countries exceed 50 including: Canada, Greece, United Kingdom, Japan, Nigeria, Portugal, Belgium, Australia, Switzerland and Germany.

This institution has developed a Training Manual for Air Traffic Safety Electronic Personnel under supervision of the International Civil Aviation Organisation. This Training Manual follows very much the same profile as the Eurocontrol training progression model. The comparison is therefore similar to the comparison reflected in the table indicated above.

Conclusion

This comparison suggests that there is a close similarity of the learning areas and duration of study between the eighty eight member states of Eurocontrol and IFATSEA programmes for training aviation technicians and this National Diploma in Communication and Navigation Systems.

ARTICULATION OPTIONS

The possibility exists for vertical articulation with this Qualification. The following qualifications serve as examples of vertical articulation:

> Bachelor of Engineering: Electronic Engineering at NQF Level 7 (NLRD ID: 5127).
> Bachelor of Science: Engineering at NQF Level 7 (NLRD ID: 14004).

Examples of horizontal articulation with this Qualification:

> Bachelor of Engineering Sciences: Electronic at NQF Level 6 (NLRD ID: 16886).
> National Diploma: Surveillance (Radar and ATC Display systems) at NQF Level 6 (Proposed).

MODERATION OPTIONS

> Moderation must include both internal and external moderation of assessments.

> Moderation of assessments will be overseen by the relevant ETQA according to the moderation guidelines and agreed ETQA procedures. This Qualification can be internally assessed by assessors of the provider and moderated by a moderator registered with the relevant ETQA.

> Moderation shall comply with SAQA requirements.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

Assessors for this Qualification will hold a NQF Level 5 Qualification in Electronics or equivalent Qualification in related disciplines within the field of electronics, or will be competent in the outcomes of this Qualification and have at least two years experience in the field. The Assessor must include both internal and external moderation of assessments.

Anyone assessing a learner or moderating the assessment of a learner against this Qualification or its Unit Standards must be a constituent registered assessor with the relevant accredited ETQA or an ETQA that has a Memorandum of Understanding with the relevant accredited ETQA.

NOTES

N/A

UNIT STANDARDS

ID	UNIT STANDARD TITLE	LEVEL	CREDITS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Fundamental	259508	Demonstrate a technical understanding of Data Communication Theory	Level 6	15
Fundamental	259501	Demonstrate a technical understanding of Radio Engineering Theory	Level 6	10
Core	15096	Demonstrate an understanding of stress in order to apply strategies to achieve optimal stress levels in personal and work situations	Level 5	5
Core	259517	Apply technical knowledge of Communication Control Systems (CCS)	Level 6	20
Core	259500	Apply technical knowledge of Direct Speech (DS) and Public Access Branch Exchange (PABX) Systems	Level 6	8
Core	259512	Apply technical knowledge of Fibre Optic link systems	Level 6	15
Core	259502	Apply technical knowledge of Recording and Playback Systems used in ground-based aviation environment	Level 6	10
Core	259503	Apply technical knowledge of Satellite Communication systems	Level 6	19
Core	259510	Apply technical knowledge of aeronautical Air Traffic Information Service (ATIS) and Digital Air Traffic information Service (D-ATIS)	Level 6	10
Core	259506	Apply technical knowledge of aeronautical Automatic Fixed Telecommunication Network (AFTN)	Level 6	10
Core	259509	Apply technical knowledge of aeronautical Ultra High Frequency (UHF) and Very High Frequency (VHF) voice and data communication reception systems	Level 6	15
Core	259513	Apply technical knowledge of aeronautical Ultra high Frequency (UHF) and Very high Frequency (VHF) voice and data communication transmission systems	Level 6	15
Core	259518	Apply technical knowledge of radio navigation Conventional Very High Frequency Omni-range (CVOR) systems	Level 6	15
Core	259519	Apply technical knowledge of radio navigation Distance Measuring Equipment (DME) systems	Level 6	15
Core	259504	Apply technical knowledge of radio navigation Instrument Landing System (ILS) Glide Path systems	Level 6	18
Core	259507	Apply technical knowledge of radio navigation Instrument Landing System (ILS) Localiser systems	Level 6	17
Core	259498	Apply technical knowledge of radio navigation Non Directional Radio Beacon (NDB) systems	Level 6	10
Core	259505	Apply technical knowledge of radio navigation Very High Direction Finding (VDF) systems	Level 6	15
Elective	252038	Prepare and manage a budget	Level 5	5
Elective	259511	Apply technical knowledge of Doppler Very High Frequency Omni-range (DVOR) systems	Level 6	10
Elective	259497	Apply technical knowledge of Microwave systems	Level 6	15
Elective	259499	Apply technical knowledge of aeronautical High Frequency (HF) voice and data communication transmission and reception systems	Level 6	15

LEARNING PROGRAMMES RECORDED AGAINST THIS QUALIFICATION
None

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of Microwave systems

SAQA US ID	*UNIT STANDARD TITLE*		
259497	Apply technical knowledge of Microwave systems		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	15

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand microwave transmission and reception systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Analyse the performance of a Microwave system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of radio navigation Non Directional Radio Beacon (NDB) systems

SAQA US ID	*UNIT STANDARD TITLE*		
259498	Apply technical knowledge of radio navigation Non Directional Radio Beacon (NDB) systems		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	10

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand NDB systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Support the certification of a NDB system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of aeronautical High Frequency (HF) voice and data communication transmission and reception systems

SAQA US ID	*UNIT STANDARD TITLE*		
259499	Apply technical knowledge of aeronautical High Frequency (HF) voice and data communication transmission and reception systems		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	15

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand HF voice and data communication transmission and reception.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Analyse the performance of a HF voice and data communication system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	64089	National Diploma: Communication and Navigation Systems	Level 6

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SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of Direct Speech (DS) and Public Access Branch Exchange (PABX) Systems

SAQA US ID	*UNIT STANDARD TITLE*		
259500	Apply technical knowledge of Direct Speech (DS) and Public Access Branch Exchange (PABX) Systems		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	8

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand PABX systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Analyse and monitor PABX and DS systems performance.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Demonstrate a technical understanding of Radio Engineering Theory

SAQA US ID	*UNIT STANDARD TITLE*		
259501	Demonstrate a technical understanding of Radio Engineering Theory		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	10

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand Electromagnetic wave Theory.

SPECIFIC OUTCOME 2
Understand Transmission Line theory.

SPECIFIC OUTCOME 3
Understand Reception and Transmission theory.

SPECIFIC OUTCOME 4
Understand Digital Signal processing theory.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Fundamental	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of Recording and Playback Systems used in ground-based aviation environment

SAQA US ID	*UNIT STANDARD TITLE*		
259502	Apply technical knowledge of Recording and Playback Systems used in ground-based aviation environment		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	10

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand Recording and Playback Systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Analyse and monitor Recording and Playback System performance.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of Satellite Communication systems

SAQA US ID	*UNIT STANDARD TITLE*		
259503	Apply technical knowledge of Satellite Communication systems		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	19

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand satellite communication systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Analyse and monitor Satellite Communication system performance.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of radio navigation Instrument Landing System (ILS) Glide Path systems

SAQA US ID	***UNIT STANDARD TITLE***		
259504	Apply technical knowledge of radio navigation Instrument Landing System (ILS) Glide Path systems		
ORIGINATOR		***PROVIDER***	
SGB Aerospace Operations			
FIELD		***SUBFIELD***	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	***UNIT STANDARD TYPE***	***NQF LEVEL***	***CREDITS***
Undefined	Regular	Level 6	18

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand ILS Glide Path systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Support the certification of an ILS Glide path system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of radio navigation Very High Direction Finding (VDF) systems

SAQA US ID	*UNIT STANDARD TITLE*		
259505	Apply technical knowledge of radio navigation Very High Direction Finding (VDF) systems		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	15

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand VDF systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Support the certification of a VDF system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of aeronautical Automatic Fixed Telecommunication Network (AFTN)

SAQA US ID	*UNIT STANDARD TITLE*		
259506	Apply technical knowledge of aeronautical Automatic Fixed Telecommunication Network (AFTN)		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	10

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand AFTN systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Analyse and monitor system performance.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of radio navigation Instrument Landing System (ILS) Localiser systems

SAQA US ID	*UNIT STANDARD TITLE*		
259507	Apply technical knowledge of radio navigation Instrument Landing System (ILS) Localiser systems		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	17

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand ILS Localiser systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Support the certification of an ILS Localiser system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Demonstrate a technical understanding of Data Communication Theory

SAQA US ID	*UNIT STANDARD TITLE*		
259508	Demonstrate a technical understanding of Data Communication Theory		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	15

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand Data Transmission and Protocol Principals.

SPECIFIC OUTCOME 2
Understand Digital Communication Principals.

SPECIFIC OUTCOME 3
Understand Network Principals.

SPECIFIC OUTCOME 4
Understand Broadband, Wireless and Internet.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Fundamental	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of aeronautical Ultra High Frequency (UHF) and Very High Frequency (VHF) voice and data communication reception systems

SAQA US ID	*UNIT STANDARD TITLE*		
259509	Apply technical knowledge of aeronautical Ultra High Frequency (UHF) and Very High Frequency (VHF) voice and data communication reception systems		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	15

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand UHF and VHF voice and data communication reception systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Analyse and monitor VHF and UHF reception system performance.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of aeronautical Air Traffic Information Service (ATIS) and Digital Air Traffic information Service (D-ATIS)

SAQA US ID	*UNIT STANDARD TITLE*		
259510	Apply technical knowledge of aeronautical Air Traffic Information Service (ATIS) and Digital Air Traffic information Service (D-ATIS)		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	10

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand ATIS and D-ATIS Systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Analyse and monitor ATIS and D-ATIS System performance.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of Doppler Very High Frequency Omni-range (DVOR) systems

SAQA US ID	***UNIT STANDARD TITLE***		
259511	Apply technical knowledge of Doppler Very High Frequency Omni-range (DVOR) systems		
ORIGINATOR		***PROVIDER***	
SGB Aerospace Operations			
FIELD		***SUBFIELD***	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	***UNIT STANDARD TYPE***	***NQF LEVEL***	***CREDITS***
Undefined	Regular	Level 6	10

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand DVOR systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Support the certification of a DVOR system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Elective	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of Fibre Optic link systems

SAQA US ID	*UNIT STANDARD TITLE*		
259512	Apply technical knowledge of Fibre Optic link systems		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	15

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand fibre optic link systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Analyse and monitor a fibre optic link system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of aeronautical Ultra high Frequency (UHF) and Very high Frequency (VHF) voice and data communication transmission systems

SAQA US ID	*UNIT STANDARD TITLE*		
259513	Apply technical knowledge of aeronautical Ultra high Frequency (UHF) and Very high Frequency (VHF) voice and data communication transmission systems		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	15

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand UHF and VHF voice and data communication transmission systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Analyse and monitor VHF and UHF transmission equipment performance.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of Communication Control Systems (CCS)

SAQA US ID	*UNIT STANDARD TITLE*		
259517	Apply technical knowledge of Communication Control Systems (CCS)		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	20

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand Communication Control systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Analyse and monitor Communication Control system performance.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of radio navigation Conventional Very High Frequency Omni-range (CVOR) systems

SAQA US ID	*UNIT STANDARD TITLE*		
259518	Apply technical knowledge of radio navigation Conventional Very High Frequency Omni-range (CVOR) systems		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	15

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Understand CVOR systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Support the certification of a CVOR system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply technical knowledge of radio navigation Distance Measuring Equipment (DME) systems

SAQA US ID	*UNIT STANDARD TITLE*		
259519	Apply technical knowledge of radio navigation Distance Measuring Equipment (DME) systems		
ORIGINATOR		*PROVIDER*	
SGB Aerospace Operations			
FIELD		*SUBFIELD*	
10 - Physical, Mathematical, Computer and Life Sciences		Physical Sciences	
ABET BAND	*UNIT STANDARD TYPE*	*NQF LEVEL*	*CREDITS*
Undefined	Regular	Level 6	15

This unit standard does not replace any other unit standard and is not replaced by another unit standard.

SPECIFIC OUTCOME 1
Demonstrating an understanding of DME systems.

SPECIFIC OUTCOME 2
Perform routine preventive maintenance.

SPECIFIC OUTCOME 3
Perform corrective maintenance.

SPECIFIC OUTCOME 4
Support the certification of a DME system.

QUALIFICATIONS UTILISING THIS UNIT STANDARD

	ID	QUALIFICATION TITLE	LEVEL
Core	64089	National Diploma: Communication and Navigation Systems	Level 6