



**NATIONAL COMPETENCY STANDARDS
FOR
DIGITAL CABLE TV TECHNICIAN
(NC2)**

**Department of Occupational Standards
Ministry of Labour and Human Resources
Thimphu, Bhutan.
October 2020**



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FOREWORD

The Department of Occupational Standards of the Ministry of Labour and Human Resources proudly presents National Competency Standards (NCS) for Digital Cable TV Technician as part of TVET reform initiative for improving the quality of Vocational Education and Training System in Bhutan. The standards represent the fruits of hard work and invaluable experiences gained by the department since its establishment in the latter half of 2003. The main aim of developing Competency Standards is to set up a well defined nationally recognized Vocational Qualification and Certification system that will help set a benchmark for the Technical Vocational Education and Training (VET) System in our country aligned to international best practices.

National Competency Standards is one of the base pillars in the Bhutan Vocational Qualification Framework (BVQF) and is the first step in its implementation. The standards are developed to ensure that employees or vocational graduates possess and acquire the desired skills, knowledge and attitude required by industries and employers. In order to ensure this close match in supply and demand of skills, knowledge and attitude, standards have been developed in close consultation and partnership with industry experts and validated by the Technical Advisory Committees for the concerned economic sectors.

A vocational education and training system based on National Competency Standards shall ensure that delivered training is of a high quality and relevant to the needs of the labour market. As a result, future TVET graduates will be better equipped to meet the need and expectations of industries and employers. This positive impact on the employability of TVET graduates will enhance the reputation of vocational education and training and make it attractive to school leavers.

While acknowledging the existing level of cooperation and collaboration, the ministry earnestly requests employers and training providers to extend the fullest support and cooperation in implementing the Standards. The ultimate objective is to build a competent and productive national workforce that will contribute to the continued socio-economic progress of our country.

I gratefully acknowledge the valuable contributions made by experts from industries during the consultation, verification and validation processes of the

standards. I look forward to improved engagement and active participation of the industry and employers in the development of a quality assured demand driven TVET system in the near future.

Director
Department of Occupational Standards
Ministry of Labour and Human Resources

Acknowledgement

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Date of Review: 13/10/2023 (max. 3 years).

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Subject experts involved for the validation of NCS:

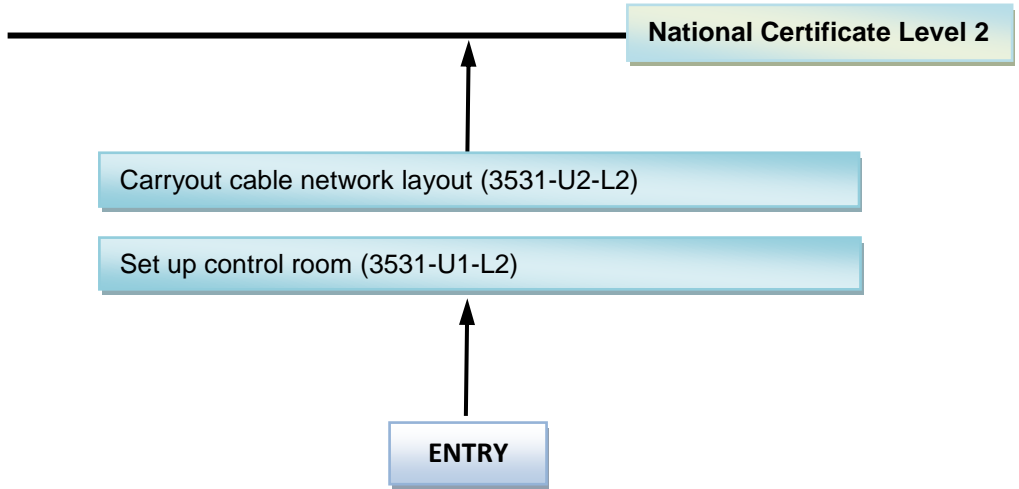
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PACKAGING OF QUALIFICATIONS



OVERVIEW OF NATIONAL COMPETENCY STANDARDS

UNIT TITLE	ELEMENTS OF COMPETENCE
1. Set up control room	<ol style="list-style-type: none"><li>1. Perform installation of power supply and back up<li>2. Install dish antenna<li>3. Lay network
2. Carryout cable network layout	<ol style="list-style-type: none"><li>1. Lay fiber optic cable and accessories<li>2. Lay coaxial cable and accessories<li>3. Connect to end user

UNIT TITLE : Set up control room

DESCRIPTOR : This unit covers the competencies required to set up control following safety procedures at all times.

CODE : 3531-U1-L2

ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA
1. Perform installation of power supply and back up	1.1 Select and use personal protective equipment (PPE) as per the job requirement following standard procedures 1.2 Select and use tools and equipment as per the job requirement following standard procedures 1.3 Install power distribution points as per the standard procedures 1.4 Install and connect backup power as per the standard procedures 1.5 Test backup power supply following standard procedures
2. Install dish antenna	2.1 Prepare site as per the satellite requirement. 2.2 Assemble dish antenna components following standard procedures 2.3 Tune the dish / receiver as per the satellite requirement following standard procedures 2.4 Install lightning arrestor as per the job requirement following standard procedures
3. Lay network	3.1 Prepare layout for the installation following standard procedures as per the job requirements 3.2 Lay wires and tension to required specifications / bending tolerance as per the job requirements following standard

	procedures
3.3	Terminate and secure cables as per the job requirements following standard procedures
3.4	Fit accessories as per the job requirement following standard procedures

RANGE STATEMENT	
PPE may include but not limited to:	
<ul style="list-style-type: none"> • Goggles • Mask • Gloves 	<ul style="list-style-type: none"> • Safety shoes • Uniform dress
Tools and equipment may include but not limited to:	
<ul style="list-style-type: none"> • Screw driver • Tester 	<ul style="list-style-type: none"> • Plier • Voltage meter
Accessories may include but not limited to:	
<ul style="list-style-type: none"> • Connectors 	<ul style="list-style-type: none"> • Power divider
Dish Antenna components may include but not limited to:	
<ul style="list-style-type: none"> • Antenna 	<ul style="list-style-type: none"> • Feed horn • LNB
Testing Tools may include but not limited to:	
<ul style="list-style-type: none"> • Satellite strength meter • Spectrum analyzer 	<ul style="list-style-type: none"> • dB meter • Power Meter

Critical Aspects:

- Demonstrate compliance with safety regulation applicable to work site operation.
- Set up control room

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Ethics and Integrity• Occupational Health and Safety (OHS) Regulations• First Aid• Basic electrical and power• Basic IT• Basic networking (Signals and transmission)• Basics of hardware components(QAM and Encoder)• Difference between Analog and Digital CATV network• Standard Operating procedures for digital cable television service(BICMA)	<ul style="list-style-type: none">• Team Work• Communication• Interpersonal relationship• Problem solving• Leadership• Customer interaction and relationship

UNIT TITLE : Carryout cable network layout

DESCRIPTOR : This unit covers the competencies required to layout cable network and connect to TV following safety procedures at all times

CODE : 3531-U2-L2

ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA
1. Lay fiber optic cable and accessories	1.1 Select and use tools and equipment as per the job requirements 1.2 Select and use Personal protective equipment (PPE) as per the job requirements 1.3 Select and use materials as per the job requirements 1.4 Prepare layout for the installation following standard procedures as per the job requirements 1.5 Lay wires and tension to required specifications / bending tolerance as per the job requirements following standard procedures 1.6 Terminate and secure cables as per the job requirements following standard procedures 1.7 Fit accessories as per the job requirement following standard procedures 1.8 Test the signal following standard procedures
2. Lay coaxial cable and accessories	2.1 Prepare layout for the installation following standard procedures as per the job requirements 2.2 Lay wires and tension to required specifications / bending tolerance as per the job requirements following standard procedures 2.3 Terminate and secure cables as per the job requirements following standard procedures

	<p>2.4 Fit accessories as per the job requirement following standard procedures</p> <p>2.5 Test the signal following standard procedures</p>
3. Connect to end user	<p>3.1 Select and use tools and equipment as per the job requirements</p> <p>3.2 Select and use Personal protective equipment (PPE) as per the job requirements</p> <p>3.3 Select and use materials as per the job requirements</p> <p>3.1 Connect set top box to TV as per the standard procedures</p> <p>3.2 Conduct signal test as per the standard procedures</p>

RANGE STATEMENT
<p>PPE may include but not limited to:</p> <ul style="list-style-type: none"> • Goggles • Mask • Gloves • Safety shoes • Uniform dress
<p>Tools and equipment may include but not limited to:</p> <ul style="list-style-type: none"> • Set top box • HDMI cable • OTDR • AV cable • Splicing machine • Laser Light Source <p>Materials may include but not limited to:</p> <ul style="list-style-type: none"> • Connectors • Node • Splitter • Patch cord/FODB

Accessories may include but not limited to:

- Amplifier
- Balun Jack
- Jointers

Critical Aspects:

- Demonstrate compliance with safety regulation applicable to work site operation
- Lay cable network and testing as per the job requirement following standard procedures

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Ethics and Integrity• Occupational Health and Safety (OHS) Regulations• First Aid• Basic electrical and power• Basic IT• Basic networking (Signals and transmission)• Types of accessories and its functions• Configuration of TV and set top box• Rules and Regulations for operation of commercial cable TV service (BICMA)	<ul style="list-style-type: none">• Team Work• Communication• Interpersonal relationship• Problem solving• Leadership• Public relationship

Annexure

1.1 National Competency Standards (NCS)

The National Competency Standards specify the skill, knowledge and attitudes applied to a particular occupation. Standards also specify the standards or criteria of performance of a competent worker and the various contexts in which work may take place. Standards provide explicit advice to assessors regarding the skill and knowledge to be demonstrated by candidates seeking formal recognition either following training or through work experience.

1.2 Purpose of National Competency Standards

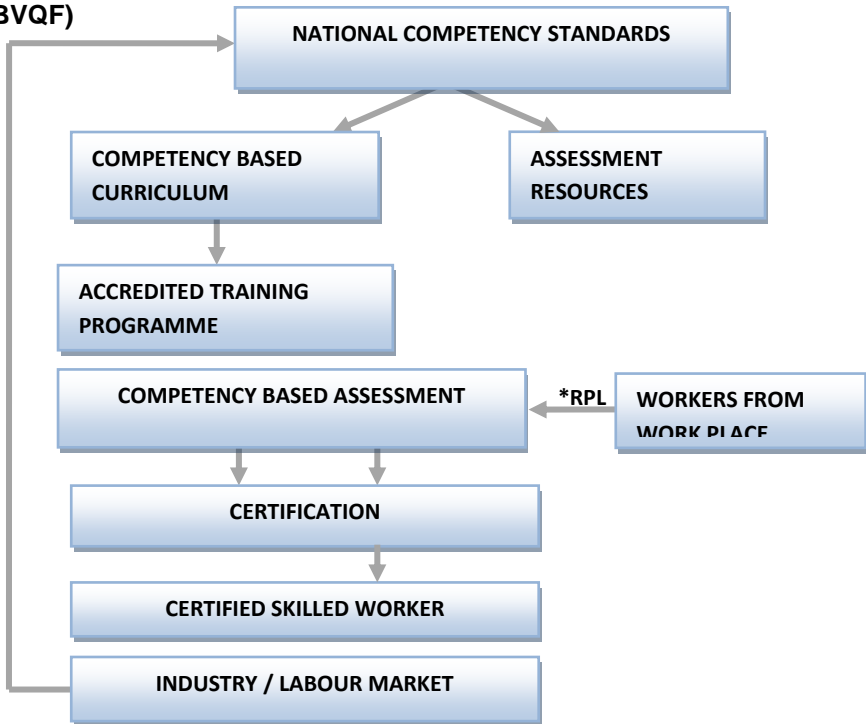
National Competency Standards serve a number of purposes including:

- Providing advice to curriculum developers about the competencies to be included in curriculum.
- Providing specifications to assessment resource developers about the competencies within an occupation to be demonstrated by candidates.
- Providing advice to industry/employers about job functions, which in turn can be used for the development of job descriptions, performance appraisal systems and work flow analysis.

1.3 Bhutan Vocational Qualifications Framework (BVQF)

Bhutan Vocational Qualifications Framework is an agreed system of Assessing, Certifying and Monitoring nationally recognized qualifications for all learning in the TVET sector against national competency standards, in training institutions, in the workplace, in schools or anywhere where learning takes place.

1.4 Components of the Bhutan Vocational Qualifications Framework (BVQF)



* RPL = Recognition of Prior Learning

1.5 BVQF Levels

The Bhutan Vocational Qualifications Framework has three levels classified based on the competency of the skilled workers. The three levels are:

- National Certificate Level 3 (NC III)
- National Certificate Level 2 (NC II)
- National Certificate Level 1 (NC I)

BVQF Level Descriptors

The qualification levels are decided based on level descriptors. The detail of the qualification level descriptor is as follows:

National Certificate Level 1

Carry out processes that:	Learning demand:	Responsibilities which are applied:
<ul style="list-style-type: none">• Are narrow in range.• Are established and familiar.• Offer a clear choice of routine responses.• Involve some prioritizing of tasks from known solutions.	<ul style="list-style-type: none">• Basic operational knowledge and skill.• Utilization of basic available information.• Known solutions to familiar problems.• Little generation of new ideas.	<ul style="list-style-type: none">• In directed activity.• Under general supervision and quality control.• With some responsibility for quantity and quality.• With no responsibility for guiding others.

National Certificate Level 2

Carry out processes that:	Learning demand:	Responsibilities which are applied:
<ul style="list-style-type: none"> Require a range of well-developed skills. Offer a significant choice of procedures requiring prioritization. Are employed within a range of familiar context. 	<ul style="list-style-type: none"> Some relevant theoretical knowledge. Interpretation of available information. Discretion and judgments. A range of known responses to familiar problems 	<ul style="list-style-type: none"> In directed activity with some autonomy. Under general supervision and quality checking. With significant responsibility for the quantity and quality of output. With some possible responsibility for the output of others.

National Certificate Level 3

Carry out processes that:	Learning demand:	Responsibilities which are applied:
<ul style="list-style-type: none"> Requires a wide range of technical or scholastic skills. Offer a considerable choice of procedures requiring prioritization to achieve optimum outcomes. Are employed in a variety of familiar and unfamiliar contexts. 	<ul style="list-style-type: none"> A broad knowledge base which incorporates some theoretical concepts. Analytical interpretation of information. Informed judgment. A range of sometimes innovative responses to concrete but often unfamiliar problems. 	<ul style="list-style-type: none"> In self-directed activity. Under broad guidance and evaluation. With complete responsibility for quantity and quality of output. With possible responsibility for the output of others.

1.7 CODING USED FOR NATIONAL COMPETENCY STANDARDS

The coding and classification system developed in Bhutan is logical, easy to use, and also aligned with international best practises. The Bhutanese coding and classification system is based on the International Standard Classification of Occupations, 2008 (ISCO-08) developed by the International Labour Organisation (ILO).

The coding of the National competency standards forms the basis of the identification code for the Vocational Education and Training Management Information System (VET – MIS) both in terms of economic sector identification and that of the individual standard.

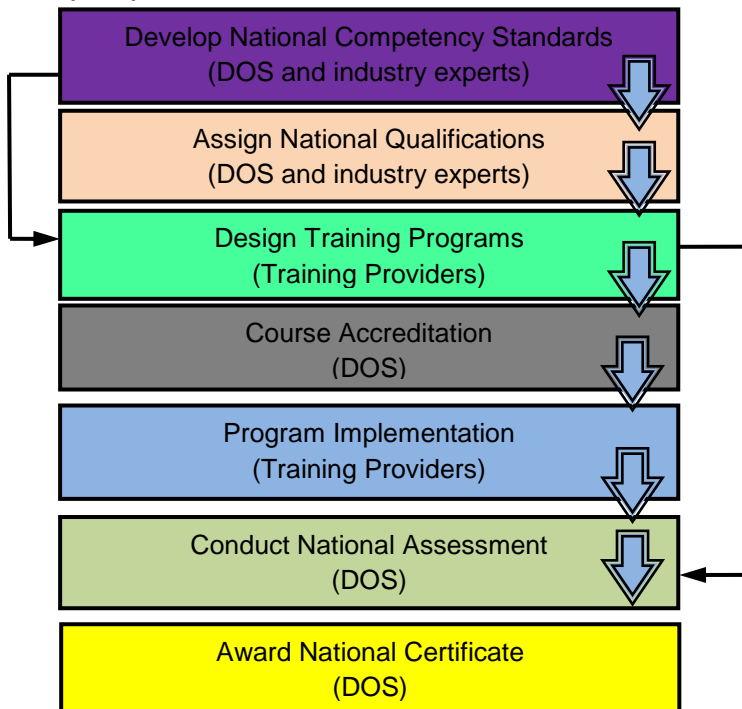
Coding the individual national competency standards

Coding the individual skills standard has a multiple purpose:

- to identify the level,
- to identify to which module the standard belongs,
- to identify in which order the standard is clustered within that module.

A job can include a number of competencies described in the national competency standards.

Implementation and operational procedures for National Competency Standards (NCS)



Key:

MoLHR – Ministry of Labour and Human Resources
DOS – Department of Occupational Standards

1.8 ASSESSMENT GUIDE

Form of assessments

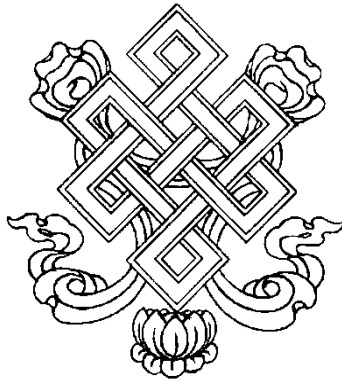
- Continuous assessment together with collected evidence of performance will be used.
- Evidence of the performance shall be based on practical demonstration.
- Knowledge can be assessed through diagrams, in writing or orally (viva-voce).

Assessment context

- Competency may be assessed in the actual work place or in a simulated workplace setting.

Assessment condition

- The candidate shall have access to all required tools, equipments, materials and documents.
- Candidate must complete the assessment in industry accepted time frame.



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