



***National Competency Standards Level-5 in Agricultural Machinery
Technology***



National Competency Standards Level-5 in Agricultural Machinery Technology

“Agricultural Machinery Mechanic”



**National Vocational and Technical Training Commission (NAVTTTC),
Government of Pakistan**



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



ACKNOWLEDGEMENTS

National Vocational and Technical Training Commission (NAVTTC) extends its gratitude and appreciation to representatives of business, industry, academia, government agencies, provincial TEVTAs, sector skill councils and trade associations who spared time and extended their expertise for the development of National Vocational Qualification for the trade of **Agricultural Machinery Technology**. This work would not have been possible without the technical support of the above personnel.

NAVTTC initiated development of CBT&A based qualifications for 200 traditional / hi-tech trades under the Prime **Minister's Hunarmand Pakistan Program**, focusing on Development & Standardization of 200 Technical & Vocational Education & Training (TVET) Qualifications. NAVTTC efforts have received full support from the Ministry of Federal Education and Professional Training which highly facilitated progress under this initiative.

It may not be out of place to mention here that all the experts of Industry, Academia and TVET experts of TEVTAs, BTEs and PVTC work diligently for making this qualification worthy and error free for which all credit goes to them. However, NAVTTC accepts the responsibility of all the errors and omissions still prevailing in the Qualification document.

It is also noteworthy that development of Skill Standards is a dynamic and ongoing process, and the developed skill standards needs periodic review and updating owing to the constant technological advancements, development in scientific knowledge, and growing experience of implementation at the grass root level as well as the demand of industry. NAVTTC will ensure to keep the qualifications abreast with the changing demands of both national and international job markets.

Executive Director (NAVTTC)



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



Table of Contents

1. Introduction	5
2. Purpose of the Qualification	5
3. Core competencies of the Qualification	6
4. Date of Validation	7
5. Date of Review.....	7
6. Minutes of Meeting	8
7. Codes of Qualifications	9
8. Members of Qualification Development Committee	10
9. Qualification Validation Committee	11
10. Entry Requirements	11
0716-MVS&A-1. Develop 2D CAD drawings	12
0716-MVS&A-2. Perform Oxy Acetylene Welding.....	14
0716-MVS&A-3. Operate Baler.....	16
0716-MVS&A-4. Maintain Baler	18
0716-MVS&A-5. Maintain Transmission System	20
0716-MVS&A-6. Maintain Hydraulic System.....	23
0716-MVS&A-7. Maintain pumps and tube wells.....	25
0716-MVS&A-8. Overhaul Engine.....	27
0716-MVS&A-9. Maintain pressurized irrigation system	30
0716-MVS&A-10. Maintain Grain Dryer	33
0716-MVS&A-11. Operate / Maintain Grain Thresher.....	36
0716-MVS&A-12. Operate / Maintain Sugar Cane Harvester	38
0716-MVS&A-13. Operate / Maintain Combine Harvester	40
0716-MVS&A-14. Develop entrepreneurial skills.....	43
0716-MVS&A-15. Apply management and communication techniques	45
0716-MVS&A-16. Create human resource management plan	47
0716-MVS&A-17. Develop project management plan	49
0716-MVS&A-18. Develop sales plan.....	51
0716-MVS&A-19. Conduct research for customer needs and satisfaction	53



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



0716-MVS&A-20.	<i>Manage finances.....</i>	55
0716-MVS&A-21.	<i>Identify and resolve problems.....</i>	57



1. Introduction

Agriculture is an important sector of Pakistan's economy. This sector directly supports the country's population and accounts for 26 percent of gross domestic product (GDP). Agricultural machinery mechanics work with modern machinery. They assemble, adjust, operate, repair, maintain and test agricultural machinery. This machinery includes land preparation, tilling, sowing & planting, irrigating, spraying, harvesting, drying and equipment handling. They often supervise skilled mechanics and other workers who keep machines and systems operating at maximum efficiency.

2. Purpose of the Qualification

The purpose of this qualification is to set the high professional standards for the agricultural machine mechanic. The specific objectives of developing these qualifications are as under:

- Improve the professional competence of the trainees
- Provide opportunities for recognition of the skills attained through formal or informal pathways
- Improve the quality and effectiveness of the training and assessment for Mechatronics Technological sector
- Enabling / helping / facilitating the existing workforce to indulge themselves in new technologies and methods



National Competency Standards Level-5 in Agricultural Machinery Technology



3. Core competencies of the Qualification

Sr No	Competency Standards	NVQF Level	Category	Estimated Contact Hours			Cr Hr
				Th	Pr	Total	
Level-5 (Agricultural Machinery Mechanic)							
1.	Develop 2D CAD drawings	5	Technical	24	36	60	6
2.	Perform Oxy Acetylene Welding	5	Technical	36	48	84	8.4
3.	Operate Baler	5	Technical	6	6	12	1.2
4.	Maintain Baler	5	Technical	10	15	25	2.5
5.	Maintain Transmission System	5	Technical	40	60	100	10
6.	Maintain Hydraulic System	5	Technical	30	27	57	5.7
7.	Maintain pumps and tube wells	5	Technical	20	24	44	4.4
8.	Overhaul Engine	5	Technical	51	99	150	15
9.	Maintain pressurized irrigation system	5	Technical	30	24	54	5.4
10.	Maintain Grain Dryer	5	Technical	12	18	30	3
11.	Operate / Maintain Grain Thresher	5	Technical	24	36	60	6
12.	Operate / Maintain Sugar Cane Harvester	5	Technical	56	78	134	13.4
13.	Operate / Maintain Combine Harvester	5	Technical	60	90	150	15
14.	Apply management and communication techniques	5	Generic	9	21	30	3
15.	Conduct research for customer needs and satisfaction	5	Generic	9	21	30	3
16.	Create human resource management plan	5	Generic	9	21	30	3
17.	Develop entrepreneurial skills	5	Generic	9	21	30	3
18.	Develop project management plan	5	Generic	9	21	30	3
19.	Develop sales plan	5	Generic	9	21	30	3
20.	Identify and resolve problems	5	Generic	9	21	30	3
21.	Manage finances	5	Generic	9	21	30	3
	Total			447	693	1140	114
	Percentage			39.21 0526 3	60.78 9473 7		



National Competency Standards Level-5 in Agricultural Machinery Technology



4. Date of Validation

The level 5 of National DAE qualification for 'Agricultural Machine Mechanic' has been validated by the Qualifications Validation Committee (QVC) members on 16th Jan, 2031 and will remain valid for ten years i.e. 16th Jan, 2031

5. Date of Review

The level 5 of National DAE qualification for 'Agricultural Machine Mechanic' has been validated by the Qualifications Validation Committee (QVC) members on 16th Jan, 2031 and shall be reviewed after 3 years i.e. 17th Jan, 2024



National Competency Standards Level-5 in Agricultural Machinery Technology



6. Minutes of Meeting



Report Regarding Validation of Competency Standards for National Vocational Qualifications Level 5 for Agricultural Machinery Technology



MINUTES OF MEETING

A meeting of Qualification Review and Validation Committee for Review and Validation of Competency Standards for the trade of "Agricultural Machinery Technology" was held at Pakistan Industrial Technical Assistance Center, Lahore from 12th – 16th Jan, 2021. The following activities took place during meeting:

1. Introduction of OP & CS file to the new participants
2. Detailed discussion regarding validation process
3. Consultation was made with the relevant industry experts to confirm the accuracy of the competency standards
4. Levels of competency standards were defined according to NVQF Level Descriptor
5. Prepared the packaging of CS as per expert's guidelines.
6. Assigned the credit hours for CS as per PBTE and NVQF guidelines.
7. Revision of competency standards as per Industry/TEVTAs/BTEs requirements
8. Tools and equipment lists were revised as per industry requirements.
9. Time allocation for contact hours is confirmed with the industry & academia representatives and adjusted accordingly.
10. Competency standards were packaged in National Occupational Standards in 5 certifications of Levels 1, 2, 3, 4 and 5.

The following experts has participated in the CS Review and Validation Committee meeting and showed their consent to validated competency standards as found them according to the requirements of the industry:

S#	Expert Name	Designation	Signature
1.	Rana Imran Sattar	Instructor, GCT, Railway Road Lahore	
2.	Mr. Atif Latif	Assistant Director (R&D), Auto Farm Expert (P-TEVTA)	
3.	Mr. Muhammad Afzal	Assistant Manager, Millat Tractors Ltd.	
4.	Engr. Shahzad Amir Rafiq	DPO Sahiwal and Pakpattan (P-TEVTA)	
5.	Engr. Jamal Akbar	Associate Prof (KP TEVTA)	
6.	Engr. Aqib Sharif	Manager Accreditation (P-TEVTA)	
7.	Syeda Fatima Iqbal	System Analyst (PBTE)	
8.	M. Shahzad Khalid	Instructor VTI Burewala (PVTC)	
9.	Mr. Nazakat Hussain Qureshi	Ex-Head, Farm Implements, Millat Tractors Ltd.	
10.	Engr. Liaquat Ali Jamroh	Director (Academics), Sindh TEVTA	
11.	Mr. Sikandar Masood	Director NAVTTC/ Coordinator	
12.	Engr. Aijaz Ahmed Zia	DACUM Facilitator	



National Competency Standards Level-5 in Agricultural Machinery Technology



7. Codes of Qualifications

The International Standard Classification of Education (ISCED) is a framework for assembling, compiling and analyzing cross-nationally comparable statistics on education and training. ISCED codes for these qualifications are assigned as follows:

ISCED Classification for level-5	
Code	Description
0716-MVS&A(1)	1 st Level National Certificate of level-5, in “Agricultural Machinery Mechanic”
0716-MVS&A (2)	2 nd Level National Certificate of level-5, in “Agricultural Machinery Mechanic”
0716-MVS&A (3)	3 rd Level National Certificate of level-5, in “Agricultural Machinery Mechanic”
0716-MVS&A 4)	4 th Level National Certificate of level-5, in “Agricultural Machinery Mechanic”
0716-MVS&A (5)	5 th Level National Certificate of level-5, in “Agricultural Machinery Mechanic”



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



8. Members of Qualification Development Committee

The following members participated in the qualifications development and validation of this qualification:

S#	Name	Designation	Organization
1.	Dr. Dilbagh Muhammad	Ex. Director Farm Machinery	PCCC Mutan
2.	Dr. Ghaffar Dogar	Visiting Professor IAGS	Punjab University
3.	Dr. Muhammad Yasin	Assistant Professor	Punjab University
4.	Mr. Muhammad Afzal	Assistant Manager	Millat Tractor
5.	Engr. Atif Latif	Assistant Director (R&D)	P-Tevta
6.	Mr. Shahzad Rashid	Lecturer	GCT Faisalabad
7.	Mr. Shakeel Ahmed	Lecturer	GCT Faisalabad
8.	Mr. Rana Imran Sattar	Assistant Professor	GCT Railway Road
9.	Mr. Maroof Siddique	PhD Scholar	Punjab University
10.	Mr. Arsalan Abbas	Research Assistant	Punjab University
11.	Engr. Abdul Kabir	Research Assistant	The University of Lahore
12.	Engr. Aijaz Ahmed Zia	DACUM Facilitator	INTECH/UET Lahore
13.	Mr. Sikandar Masood	Director SS&C	NAVTTC HQs



National Competency Standards Level-5 in Agricultural Machinery Technology



9. Qualification Validation Committee

The following members participated in the qualifications development and validation of this qualification:

S#	Name	Designation	Organization
1.	Rana Imran Sattar	Instructor	GCT, Railway Road Lahore
2.	Mr. Atif Latif	Assistant Director	P- TEVTA
3.	Mr. Muhammad Afzal	Assistant Manager,	Millat Tractors Ltd.
4.	Engr. Shahzad Amir Rafiq	DPO Sahiwal and Pakpattan	P-TEVTA
5.	Engr. Jamal Akbar	Associate Prof	KP TEVTA
6.	Engr. Aqib Sharif	Manager Accreditation	P-TEVTA
7.	Syeda Fatima Iqbal	System Analyst	PBTE
8.	M. Shahzad Khalid	Instructor	VTI Burewala PVTC
9.	Mr. Nazakat Hussain Qureshi	Ex-Head, Farm Implements	Millat Tractors Ltd.
10.	Mr. Sikandar Masood	Director / Coordinator	NAVTTC
11.	Engr. Aijaz Ahmed Zia	DACUM Facilitator	INTECH/UET

10. Entry Requirements

The entry requirements for National Certificate level 5, in Agricultural Machinery Technology are:

1. A person having middle education (8th class)
2. National Certificate level 4, in Agricultural Machinery



11. Detail of Qualifications and its Competency Standards

0716-MVS&A-1. Develop 2D CAD drawings

Overview. This competency standard covers the skills and knowledge required to Develop and prepare 2D objects

Competency Unit	Performance Criteria
CU1. Develop 2D Objects	<p>P1. Setup the drawing interfaces for the required specifications</p> <p>P2. Setup the user interface settings for the required specifications</p> <p>P3. Save the CAD drawing files in various file formats such as DWG, PDF, and JPG.</p> <p>P4. Create the 2D Objects with the given measurements</p> <p>P5. Edit 2D Objects to meet set standards</p>
CU2. Prepare Final Set of 2D Drawings	<p>P1. Use an appropriate command and tools to develop the 2D Drawing</p> <p>P2. Develop a 2D Drawing with the given project specifications and measurements</p> <p>P3. Create a title block layout as required</p> <p>P4. Plot drawing on scale according to required size and orientation</p>

Knowledge & Understanding

- Basics of Drawing Settings
- Unit setting
- Limits setting
- User coordinate system Workspace setting
- Object Snap Settings
- Basic Commands and Concepts Angles and lines in CAD Software.
- Differentiate between absolute, relative and polar system
- DIMSTYLE and MTEXT commands
- HATCHING concepts in CAD Software
- Differentiate between CHAMFER and FILLET command
- Types of Array
- OFFSET, CIRCLE and ROTATE short commands
- Zooming options
- Tools palettes window
- Design center
- Scale and paper sizes



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



- Modify dimension style and text size according to paper size
- Backup file

Critical Evidence

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in the following competency standard.

- Draw lines and circles in CAD software
- Draw different types of triangles in CAD software.

Tool and Equipment

S. No.	Items
1.	Computer with all accessories
2.	Engineering CAD software
3.	Physical Models / Prototype



0716-MVS&A-2. Perform Oxy Acetylene Welding

Overview: This competency standard covers the skills and knowledge required to Practice of making Tee Joint, Practice of making Lap Joint and Practice of Making Butt Joint

Critical Evidence	Performance Criteria
CU1. Practice of making Tee Joint	<p>P1. Take Work piece as per drawing</p> <p>P2. Straiten it with the help of hammer and anvil</p> <p>P3. Grind the work pieces on grinding machine to prepare the edges flat and parallel to each other</p> <p>P4. Place the Bottom piece on work table and place the Top plate at 90° to each other as per drawing</p> <p>P5. Set the flame of welding torch as per standard</p> <p>P6. Complete the bead as per standard</p>
CU2. Practice of Making Butt Joint	<p>P1. Take Work piece as per drawing</p> <p>P2. Straiten it with the help of hammer and anvil</p> <p>P3. Grind the work pieces on grinding machine to prepare the edges flat and parallel to each other</p> <p>P4. Place the work pieces parallel to each other</p> <p>P5. Set the flame of welding torch as per standard</p> <p>P6. Complete the bead as per standard</p>

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of.

- Explain positions of electrode according to work
- Knowledge of setting the current on welding machine
- Describe motion of electrode in ARC welding
- Explain importance of gap between electrode and base metal
- Describe use of tri square
- Describe importance of cleanliness of surface to be welded

Critical Evidence

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard.



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



- Grind the work pieces on grinding machine to prepare the edges flat and parallel to each other
- Set the flame of welding torch as per standard
- Make the Tee Joint.
- Make Lap Joint
- Make Butt Joint

Tools and Equipment

S. No.	Items
1.	PPEs
2.	Oxygen cylinder
3.	Acetylene gas cylinder
4.	Pressure regulators
5.	Cylinder key
6.	Welding torch
7.	Rubber house pipe
8.	Back fire arrester
9.	Flash back arrester





0716-MVS&A-3. Operate Baler

Overview: After this competency standard candidate will be able to operate baler.

Competency Unit	Performance Criteria
CU1. Ensure Safety while operating baler	P1. Select appropriate PPEs P2. Wear PPEs P3. Interpret Warning signs
CU2. Identify types of Baler	P1. Identify major types of baler P2. Identify major components of baler P3. Identify best baler for required crop
CU3. Perform Baler applications	P1. Select Baler type (crop) P2. Identify the baler for required crop P3. Interpret post harvest losses P4. Select shaft according to tractor (PTO driven shaft) P5. Adjust RPM according to machine requirement (540) P6. Check Required ropes and adjust bale size

Knowledge & Understanding

The candidate must be able to operate different types of **balers** can help operators select the right one

- List down various components of Baler
- Define major baler operations

Tools and Equipment

The tools and equipment required for this competency standard are given below:

S. No.	Items
1.	Combination plier



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



2.	Screw driver(FLAT)
3.	Screw driver (Flip)
4.	Open end spanner set
5.	Special Tool(Baler)

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

Identify major types of baler(Vertical /Horizontal) PTO Drive shaft (Select shaft according to tractor)



0716-MVS&A-4. Maintain Baler

Overview: After this competency standard candidate will be able to maintain baler

Competency Unit	Performance Criteria
CU1. Hitch of baler	P1. Align the 3 point hitch system with the baler P2. Hitch the Baler P3. Select capacity of baler as per field operations
CU2. Trouble shoot Baler Problems	P1. Check Bill hook tension P2. Check baler RPM P3. Check sharp edges around knoter P4. Check sharpness of knife P5. Check Hydraulic pump performance P6. Check high pressure pipe and line P7. Check lifting jack seals P8. Check timing of sickle assembly P9. Check knotter assembly
CU3. Service of Baler	P1 . Clean it with air pressure P2. Lubricating Greece nipples P3. Adjust its clutch P4. Lubricate sickle assembly P5. Adjust picking bars P6 . Tightening of nuts and bolts with required torque P7. Adjust Bale Tension manually

Knowledge & Understanding

- Enlist components of baler
- Describe Components of Baler
- Define Baler maintenance
- Enlist services checklist
- Enlist tools

Tools and Equipment



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



The tools and equipment required for this competency standard are given below:

S. No.	Items
1.	Combination piler
2.	Screw driver(FLAT)
3.	Screw driver (FLIP)
4.	Open end Spanner set
5.	Special Tool(Baler)
6.	Oil Can
7.	Air compressor
8.	Service nozzle
9.	Grease gun

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- Check timing of sickle assembly
- Adjust Bale Tension manually



0716-MVS&A-5. Maintain Transmission System

Overview. After this competency standard candidate will be able to maintain the transmission system

Competency Unit	Performance Criteria
CU1. Service the clutch assembly	P1: Park the Prime Mover on level surface P2: Place the line jacks P3: Disconnect the electrical connections P4: Open the bolts of transmission and engine assembly P5: Split the Prime Mover P6: Bolt the clutch assembly for dis-engagement P7: Install the clutch centralizer P8:Open the clutch assembly mounting bolts P9: Assemble the Clutch assembly
CU2. Replace the PTO Clutch Plate	P1:: Park the Prime Mover on level surface P2: Place the line jacks P3: Disconnect the electrical connections P4: Open the bolts of transmission and engine assembly P5: Split the Prime Mover P6: Bolt the clutch assembly for dis-engagement P7: Install the clutch centralizer P8:Open the clutch assembly mounting bolts P9:Remove the pins and locks of Release levers P10:Remove the Bolts P11:Rplace the PTO Clutch plate P12:Assemble the Clutch Assembly P13:Assemble the Prime Mover assembly
CU3. Maintain the Gear Box assembly	P1: Park the Prime Mover on level surface P2: Place the line jacks P3: Disconnect the electrical connections P4: Open the bolts of transmission and engine assembly P5: Split the Prime Mover P6: Open the center housing to gear box bolts P7:Remove the clutch paddle and brake paddle with shafts P8:Remove the retainer assembly



National Competency Standards Level-5 in Agricultural Machinery Technology



	<p>P9: Remove the cover plate of cover shaft</p> <p>P10: Remove the EP cyclic gear reduction unit</p> <p>P11: Remove the shifting rails and forks</p> <p>P12: Remove the locks and pull the Main shaft</p> <p>P13: Remove PTO drive shaft from counter drive shaft</p> <p>P14: Remove lock of counter shaft</p> <p>P15: Assemble the Gear box appropriately</p> <p>P16: Filed test the accuracy of gearbox</p>
CU4. Maintain pinion of rear Axel	<p>P1: Park the Prime Mover on level surface</p> <p>P2: Place the line jacks</p> <p>P3: Disconnect the electrical connections</p> <p>P4: Disconnect the brake linkages</p> <p>P5: Open the bolts of transmission and center housing</p> <p>P5: Split the Rear Axel</p> <p>P6: Remove the Nuts & Bolts from center housing to Axel housing</p> <p>P7: Split the Left side Axel housing</p> <p>P8: Remove Bolts of Pinion Assembly</p> <p>P9: Remove the Pinion</p> <p>P10: Fasten the assembly on bench vice</p> <p>P11: Remove the locking pin & locking nut</p> <p>P12: Remove the bearing & Sleeve</p> <p>P13: Clean the assembly parts with kerosene oil</p> <p>P14: Reassemble the Pinion Assembly as per standard procedure</p> <p>P15: Preloading of pinion assembly</p> <p>P16: Install the pinion assembly as per standard procedure</p>
CU5. Maintain Differential case of rear Axel	<p>P1: Park the Prime Mover on level surface</p> <p>P2: Place the line jacks</p> <p>P3: Disconnect the electrical connections</p> <p>P4: Disconnect the brake linkages</p> <p>P5: Open the bolts of transmission and center housing</p> <p>P5: Split the Rear Axel</p> <p>P6: Remove the Nuts & Bolts from center housing to Axel housing</p> <p>P7: Split the Left side Axel housing</p> <p>P8: Remove the differential case</p> <p>P9: Remove the differential case bearing</p> <p>P10: Remove the bolts of differential case</p>



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



- P11: Remove the planetary gear and thrust washers
- P12: Remove the nut & bolt of crown wheel and differential case
- P13: Clean the parts with kerosene oil
- P14: Reassemble the Crown wheel and differential case Assembly as per standard procedure
- P15: Assemble the Axle Housing as per standard procedure

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes.

- Name and explain different type of gears and its applications
- Define the working principle of Gear box

Tools and Equipment

The tools and equipment required for this competency standard are given below.

S. No.	Items
1.	Special Service Tools of Gear Box
2.	Spanner set
3.	Combination plier

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard.

- Replace gear shift forks



0716-MVS&A-6. Maintain Hydraulic System

Overview. After this competency standard candidate will be able to maintain the Hydraulic System

Competency Unit	Performance Criteria
CU1. Service the Hydraulic pump	<ul style="list-style-type: none">P1. Park the Prime Mover on level surfaceP2. Place the line jacksP3. Split the Prime Mover from gear box and central hosingP4. Remove the stand pipeP5. Remove both mounting DowelsP6. Remove the Hydraulic pumpP7. Remove Hydraulic strainerP8. Remove the suction manifoldP9. Remove the drive end plateP10. Remove the drive shaftP11. Clean the Hydraulic pump with kerosene oilP12. Replace the chamber valve kit & piston ringsP13. Place the rubber O-ringsP14. Assemble the Hydraulic PumpP15. Check the pump pressure with appropriate tools and gauges
CU2. Service the Hydraulic top cover	<ul style="list-style-type: none">P1. Remove the linkagesP2. Open the bolts of hydraulic top coverP3. Disassemble the ram cylinder nutsP4. Remove the vertical leverP5. Remove the lift armsP6. Disconnect the draft control linkagesP7. Disconnect the Position control linkagesP8. Remove the arm shaftP9. Clean the assemble with kerosene oilP10. Assemble the Hydraulic Top cover
CU3. Adjust the Draft control	<ul style="list-style-type: none">P1. Adjust the QuadrantP2. Adjust the control lever position on quadrantP3. Adjust the position control lever on transport positionP4. Adjust the Draft control lever on sector markP5. Adjust vertical lever on right angleP6. Tight the nut and lock



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



	P7. Check the adjustment during field operation
CU4. Adjustment of Position control lever	P1.Place the control lever on position control P2.Place the draft control lever on up position P3.Tight the Allen screw until vertical lever places on right angle P4.Check nut or lock P5.Check the adjustment during field operation

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes.

- Explain the hydraulic system components of Prime Mover
- Explain the troubleshooting and remedy of Hydraulic system

Tools and Equipment

The tools and equipment required for this competency standard are given below.

S. No.	Items
1.	Special Service tools
2.	Spanner set
3.	Screw driver
4.	Allen key
5.	Pressure gauge 6000 lb

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard.

- Adjust the Draft control lever
- Replace the hydraulic pump



0716-MVS&A-7. Maintain pumps and tube wells

Overview: After this competency standard candidate will be able to learn pumps and tube wells maintenances practices/techniques required for the different crops.

Competency Unit	Performance Criteria
CU1. Identify pumps and tube wells	P1. Identify different types of pumps and tube wells. P2. Identify the major components of pumps and tube wells. P3. Identify the prime mover for pump and tube well. P4. Identify the water table depth
CU2. Operate pumps and tube well	P1. Interpret safety precautions regarding pumps and tube wells. P2. Adjust the rpm of Prime Mover as per manufacturer guidelines P3. Engage clutch for smooth startup of the pump P4. Adjust RPM of the prime mover to deliver optimum discharge
CU3. Maintain pumps and tube wells	P1. Check drive belts and pulleys P2. Open the impeller housing P3. Remove the shaft and impeller P4. Check the impeller and shaft condition P5. Remove the bearing with special tool P6. Insert new joint kit P7. Re-assemble the pump P8. Lubricate the lubricant points.

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- List down various types of pumps and tub wells.
- Describe the safety precautions for operating pumps and tube wells

Tools and Equipment



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



The tools and equipment required for this competency standard are given below:

S. No.	Items
1.	Combination plier
2.	Adjustable wrench
3.	Hammer
4.	Screw driver (flat)
5.	Screw driver (phlip)
6.	Open end spanner

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- Adjust the discharge of tube well



0716-MVS&A-8. Overhaul Engine

Overview. After this competency standard candidate will be able to perform Overhauling of Tractor, in accordance with the Manufacturer's Manual.

Competency Unit	Performance Criteria
CU1. Remove the accessories from engine	P1.Park the tractor on level surface P2.Disconnect the battery terminal P3.Disconnect the fuel supply system P4. Disconnect the cooling system P5. Disconnect the lubrication system P6.Disconnect the front axle from engine P7.Disconnect engine from clutch or Transmission housing P8.Separate engine from Tractor
CU2. Dismantle cylinder Head Assembly	P1 Place the engine level surface P2 Disconnect the intake manifold P3 Disconnect the exhaust manifold P4 Disconnect the cylinder head cover P5 Disconnect the timing gear assembly P6 Disconnect the cylinder head cover P7 Dismantle or open the bolt of cylinder head from cylinder block P8 Remove the cylinder head from cylinder block P9 Place the cylinder head proper place P10 Disconnect the rocker arm assembly from cylinder head P11 Disconnect the valve spring with valve spring compressor P12 Remove the valve from cylinder head P13 Perform the operation of Warpage
CU3. Dismantle the oilpan	P1.Drain the oil from oil pan P2.Dismantle the oil pan bolts P3.Dismantle oil pan P3.Dismantle jan or gas kit
CU4. Dismantle connecting rod and piston	P1.Dismantle the big end bearing bolts P2.Remove the big end bearing P2.Remove the connecting rod



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



CU5. Disconnect the piston from connecting rod	P1.Dismantle the lock ring from piston pins P2.Remove gudgeon pin P3.Separate the piston from connecting rod
CU6. Remove the piston rings from piston	P1.Collect the ring compressor P2.Remove the rings from piston P3.Separate the piston from connecting rod
CU7. Check piston condition	P1.Check the piston physical condition P2.Check the piston ovalness P3.Check the piston ring area
CU8. Remove the crankshaft	P1.Disconnect the journal bearing P2.Disconnect the thrust bearing P3.Remove the crankshaft from block P4.Inspect the physical condition of crankshaft
CU9. Remove the camshaft	P1.Disconnect the cam shaft bearing bolt P2.Remove the bearing cap P3.Remove the camshaft from block P4.Inspect the physical condition of camshaft
CU10. Perform cylinder bore measurement	P1.Clean the cylinder block P2.Measure the bore ovalness P3.Inspect the sleeve condition
CU11. Check water jacket and oil gallery into cylinder block	P1.Clean the cylinder block P2.Flash the water jacket P3.Flash the oil gallery P4.Inspect the physical condition of cylinder block water jacket P5.Inspect the physical condition of cylinder block oil gallery

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes.

- State the precautionary measures for engine overhauling
- Differentiate between compression ignition and spark ignition engines
- Explain working principle of compression ignition and spark ignition engines



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



- Engine overhauling operation

Tools and Equipment

The tools and equipment required for this competency standard are given below.

S. No.	Items
1.	Engine
2.	SST for Engine
3.	Socket set
4.	Spanner set
5.	Hammer
6.	Screwdriver
7.	Feeler gauge
8.	Scale

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard.

- Overhaul the Tractor Engine



0716-MVS&A-9. Maintain pressurized irrigation system

Overview: After this competency standard candidate will be able to learn maintenances of high efficiency irrigation system sites.

Competency Unit	Performance Criteria
CU1. Check Pumping System before operation	<p>P1. Check fuel, oil and water level in diesel engine</p> <p>P2. Select appropriate type of fertilizer</p> <p>P3. Check fertilizer level in the tank</p> <p>P4. Carry out idle running of fertilizer pumps</p> <p>P5. Check pipes for delivery of water and fertilizer</p> <p>P6. Carryout cleanliness of valves, filter, nozzles etc.</p> <p>P7. Carryout chlorination of water storage tank and pump</p>
CU2. Check Pumping System during Startup	<p>P1. Verify that the pumps are functioning properly.</p> <p>P2. Watch for unusual noises, vibrations and overheating that may develop in the pump drive due to pump malfunction</p>
CU3. Check Pumping System after Startup	<p>P1. Check pressure and flow rate at pump outlets</p> <p>P2. Check fertilizer and/or chlorine injection; check dosage.</p> <p>P3. Check downstream filter pressure and make sure that pressure loss is within the acceptable limits.</p> <p>P4. Check the system visually for bursts</p> <p>P5. Select critical points in the irrigation system and measure the pressure at those points</p>
CU4. Check Pressure Gauges and System Flushing	<p>P1. Start the pump and allow pressure to become stable</p> <p>P2. Open the drain valves of hydrocyclone and screen filters</p> <p>P3. Back wash the sand media filter</p> <p>P4. Operate by pass valve to maintain pressure in the system</p> <p>P5. Visit the field to rectify leakage/damage, if any</p> <p>P6. As irrigation over, check the wetting patterns</p> <p>P7. Remove the end caps of laterals (4-5) and flush for 1-2 minutes and also check impurities</p> <p>P8. Flush the submain to remove debris</p> <p>P9. Check out system wear and tear</p>



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



	P10. Lubricate the pump and motor
CU5. Maintain Mains and Sub-Mains	P1. Tight clumps near the system to tighten the mainline with the system, if leakage/breakage occurs P2. Flush Mainline to remove any blockage in the mainline.
CU6. Maintain laterals and emitting devices	P1. Identify damage or leakage of the lateral and emitting devices (drippers, mini/micro sprinklers etc.) by visual inspection. P2. Fix the damages of the lateral by replacing the damaged portion of the lateral and attaching new portions P3. Clean the emitting devices by opening and cleaning the device.

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- List down various components of pressurized irrigation system.
- Describe the trouble shooting of pressurized irrigation system

Tools and Equipment

The tools and equipment required for this competency standard are given below:

Items	
1.	Pipe wrench (No. 18, 24 or 36)
2.	Spanner set
3.	Drill machine with Drill bits (if not available, can be achieved on rental basis)
4.	Screw driver and Pliers
5.	Hand saw blade with frame
6.	Measuring tap
7.	Emitters/drippers/bubblers
8.	Screens of screen filter and discs of disc filters
9.	Joiners
10.	End caps/stop valves
11.	Engine/motor belts
12.	Silica sand
13.	Few extra lateral lines
14.	Air release valve



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



- | | |
|-----|--|
| 15. | Lubricants for diesel engine/motor/pump |
| 16. | Gaskets for the lids of fertilizer tank/sand media filters |
| 17. | Pressure gauges |

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- Back Flushing of Sand Media Filters



0716-MVS&A-10. Maintain Grain Dryer

Overview: After this competency standard candidate will be able to manage and maintain different types of Grain Dryer.

Competency Unit	Performance Criteria
CU1. Identify Grain Dryer Types	<p>P1. Enlist types of grain dryers</p> <p>P2. Select appropriate grain dryer with respect to specified grain type</p> <p>P3. Select appropriate grain dryer with respect to specified environment conditions</p>
CU2. Maintain Electric Dryer	<p>P1. Check major components electric dryer.</p> <p>P2. Perform weekly maintenance of electric dryer.</p> <p>P3. Clean screens with water.</p> <p>P4. Maintain blower system.</p> <p>P5. Maintain the speed of blower according to grain requirement.</p> <p>P6. Calibrate moisture sensor accordingly grain requirement.</p> <p>P7. Clean the sensor with soft cloth on daily basis.</p>
CU3. Maintain Solar Photovoltaics(PV) Dryers	<p>P1. Check major components of solar dryer (PV Fan, Air collector, drying chamber with air ducts, chimney)</p> <p>P2. Adjust solar energy collector at angle facing due south equal to latitude.</p> <p>P3. Check air collector insulation for leakage</p> <p>P4. Check the dryer frame for its alignment</p> <p>P5. Check drying chamber well insulated air tight</p> <p>P6. Check collector plate absorber painted matt black</p> <p>P7. Ensure that glass cover, collector absorber and PV fan module is free from dust</p> <p>P8. Check wear and tear and leakages of glass and dryer frame</p> <p>P9. Repair wear and tear of glass and frame (if required)</p> <p>P10. Maintain blower speed according to requirement of grain</p>

Knowledge & Understanding



National Competency Standards Level-5 in Agricultural Machinery Technology



The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- List down various Grain Dryers.
- Describe the working of different Grain Dryers.
- Describe how to operate different grain dryers.
- Explain the method of grain moisture measurements
- Define the safe moisture levels for different grains

Tools and Equipment

The tools and equipment required for this competency standard are given below:

S. No.	Items
6.	Inclinometer (Angle measuring)
7.	Spanner set
8.	Adjustable wrench
9.	Combination plier
10.	Nose plier
11.	Screw driver(flat)
12.	Grain Moisture Meter

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- Adjust solar energy collector angle and direction
- Maintain the speed of blower according to grain requirements



***National Competency Standards Level-5 in Agricultural Machinery
Technology***



Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- Sequence the operations of Self Propelled Reaper



0716-MVS&A-11. Operate / Maintain Grain Thresher

Overview: After this competency standard, candidate will be able to select adjust, Maintain and operate Grain Thresher

Competency Unit	Performance Criteria
CU1. Select Thresher	P1. Identify types of Thresher P2. Enlist Main Component of Thresher
CU2. Maintain Thresher	P1. Service and Lubricate (Greasing) thresher pulleys P2. Adjust tension of belts P3. Adjust Thresher Header P4. Adjust Threshing Drum Concave P5. Check Feeder Table Repair / Clean it if required P6. Check Crimp Screen P7. Inspect dressing fan P8. Check Dust Exhaust Plate (clean it if required) P9. Overhaul the Threshers covering : <ul style="list-style-type: none">• Feeding & Threshing Unit• Blowing & separating Unit• Sieve Assembly• Power Transmission Unit• Grain Handling Unit
CU3. Operate Thresher	P1. Mount Thresher with Tractor P2. Operate Tractor mounted Thresher P3. Operate Auxiliary engine thresher (Peter engine type) P4. Operate Self Propelled Thresher (Field Visit)

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- State the purpose of Thresher



National Competency Standards Level-5 in Agricultural Machinery Technology



- Enlist the parts of Thresher
- Enlist the types of Thresher
- Service and repair thresher
- State the mechanism of Thresher

Tools and Equipment

The tools and equipment required for this competency standard are given below:

S. No.	Items
1	Tool kit
2	Hammer
3	Grease
4	Grease Gun
5	Lubrication Oil
6	Goggles
7	Gloves
8	Cotton Waste
9	Operator Safety Helmet
10	Works shop safety Helmet
11	Auxiliary Engine Thresher
12	Self Propelled Thresher

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- Service and adjust of Thresher
- Overhauling of Thresher
- Sequence the operations of Thresher



0716-MVS&A-12. Operate / Maintain Sugar Cane Harvester

Overview: After this competency standard, candidate will be able to select appropriate, adjust and operate Sugar Cane Harvester.

Competency Unit	Performance Criteria
CU1. Inspect Sugar Cane Harvester	<p>P1. Select appropriate tools for adjustment</p> <p>P2. Check the adjustment of belts and Chains</p> <p>P3. Inspect Topper of Sugarcane Harvester for carrying</p> <p>P4. Inspect Crop divider and Lifter of Sugarcane Harvester for dividing and lifting</p> <p>P5. Inspect Base Cutter of Sugarcane Harvester for cutting</p> <p>P6. Inspect Conveying device of Sugarcane Harvester for conveying</p> <p>P7. Inspect defoliating device of Sugarcane Harvester regarding defoliating efficiency</p> <p>P8. Inspect Cane Collector of Sugarcane Harvester</p>
CU2. Operate Sugar Cane Harvester	<p>P1. Inspect the control panel and adjust if required</p> <p>P2. Start the Sugar cane harvester and interpret the signs and signals of instrument cluster</p> <p>P3. Select the cutting size of sugar cane</p> <p>P5. Adjust the height of cutting assembly</p> <p>P6. Ensure safe transmission of sugar cane to Dumper</p>
CU3. Maintain Sugar Cane Harvester	<p>P1. Maintain blade sharpness</p> <p>P2. Lubricate all lubricants point</p> <p>P3. Service the Sugar cane Harvester</p> <p>P4: Lubricate the greasing points of sugarcane harvester</p> <p>P5. Park Sugarcane harvester according to operator manual</p>

Knowledge & Understanding



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- State the purpose of Sugar Cane
- Enlist the parts of Sugar Cane
- State the mechanism of Sugar Cane

Tools and Equipment

The tools and equipment required for this competency standard are given below:

S. No.	Items
1.	Tool kit
2	Goggles
3	Gloves
4	Operator Safety Helmet
5	Workshop Safety Helmet
6	Sugar Cane Harvester

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- Service and adjust of Sugar Cane Harvester
- Sequence the operations of Sugar Cane Harvester



0716-MVS&A-13. Operate / Maintain Combine Harvester

Overview: After this competency standard, candidate will be able to select appropriate, adjust and operate Combine.

Competency Unit	Performance Criteria
CU1. Inspect General Combine Section	<p>P1. Select appropriate tools for adjustment</p> <p>P2. Check the adjustment of belts</p> <p>P3. Prepare Inspection report</p> <p>P4. Inspect and service the following unit of Combine Harvester</p> <ul style="list-style-type: none">• Pickup type reel / Bay Type Reel• Cutter Bar• knife section• Guards• Ledger plates• Wearing plates• Pitman Drive assembly <p>P5. Calculate the real index</p> <p>P6. Inspect the following component of Feeding Unit for Grain Losses</p> <ul style="list-style-type: none">• Header Auger• Retractable Fingers• Feeder Conveyer• Feeder Beater <p>P7. Inspect the following components of Threshing Unit for Threshing Efficiency</p> <ul style="list-style-type: none">• Rasp bar cylinder• Rub bar cylinder• Spike tooth cylinder• Concave• Cylinder beater• Feeding plate



	<ul style="list-style-type: none"> • Cylinder stripper <p>P8. Inspect the following components of Separating Unit for Grain Brakeage</p> <ul style="list-style-type: none"> • Concave Grates • Finger Grate • Straw walker • Grain Return pan • Grain Pan <p>P9. Inspect the following components of Cleaning Unit For Cleaning Efficiency</p> <ul style="list-style-type: none"> • Adjustable Chaffer • Chaffer Extension • Shoe Sieve • Cleaning Fan • Clean Grain Auger & Elevator • Tailing Auger & Elevator
CU2. Operate Combine Harvester	<p>P1. Inspect the control panel Signs, Signal and adjust if required</p> <p>P2. Start the harvester</p> <p>P3. Operate the mechanism / Basic Operation of Combine Harvester</p> <ul style="list-style-type: none"> • Cutting Unit / Mechanism • Feeding Unit / Mechanism • Threshing Unit / Mechanism • Separating Unit / Mechanism • Cleaning Unit / Mechanism • Grain Handling Unit / Mechanism <p>P3. Select the threshing drum according to job requirement</p> <p>P4. Adjust the R.P.M of each section</p> <p>P5. Adjust the height of header</p> <p>P6. Adjust the height of real (according to crop)</p>
CU3. Ensure Safe Unloading	<p>P1. Observe grain sensor</p> <p>P2. Perform unloading</p> <p>P3. Restore the unloading operation (Grain Auger)</p> <p>P4. Park Combine harvester according to operator manual</p>



National Competency Standards Level-5 in Agricultural Machinery Technology



Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- State the purpose of Combine
- Enlist the parts of Combine
- State the mechanism of Combine

Tools and Equipment

The tools and equipment required for this competency standard are given below:

S. No.	Items
1	Tool kit
2	Hammer
3	Grease
4	Grease Gun
5	Lubrication Oil
6	Goggles
7	Gloves
8	Cotton Waste
9	Operator Safety Helmet
10	Works shop safety Helmet
11	Combine Harvester

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- Service and adjust of Combine

Sequence the operations of Combine



Generic Competencies

0716-MVS&A-14. Develop entrepreneurial skills

Overview: This Competency Standard identifies the competencies required to develop entrepreneurial skills by Hotel manager, in accordance with the organization's approved guidelines and procedures. You will be expected to develop a business plan, collect information regarding revenue generation, develop a marketing plan and develop basic business communication skills. Your underpinning knowledge regarding entrepreneurial skills will be sufficient to provide you the basis for your work.

Competency Unit	Performance Criteria
CU1. Develop a business plan	<p>P1. Conduct a market survey to collect following information</p> <ul style="list-style-type: none">• Business Model• Financials• Equipment Estimation• Revenue Generation Sources• Marketing strategy• Market Trends• Overall Expenses <p>P2. Select the best option in terms of cost, service, quality, sales, operational expenses</p> <p>P3. Compile the information collected through the market survey, in the business plan format</p>
CU2. Develop a marketing plan	<p>P1. Make a marketing plan for the service products, price, placement, promotion, people, packaging and positioning</p> <p>P2. Include the information of marketing plan in the business plan</p>
CU3. Develop basic business communication skills	<p>P1. Communicate with guests using effective communication skills</p> <p>P2. Use different modes of communication to communicate effectively e.g.: presentation, speaking, writing, listening, visual representation, reading etc.</p> <p>P3. Use specific business terms used in the market</p>

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- 7Ps of marketing including product, price, placement, promotion, people, packaging and positioning
- 7Cs of business communication
- Different modes of communication and their application in the industry
- Specific business terms used in the industry
- Available funding sources



***National Competency Standards Level-5 in Agricultural Machinery
Technology***



- Low interest loans to start a new business
- Market survey and its tools e.g. : questionnaire, interview, observation etc.,
- Market trends for specific product offering
- State the main elements of business plan
- Business plan format

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- List 7Ps of marketing
- List 7Cs of business communication



0716-MVS&A-15. Apply management and communication techniques

Overview: This unit describes the skills and knowledge required to provide a critical link between people, ideas and information at all stages in the project life cycle. It involves assisting the project team to plan communications, communicating information related to the project, and reviewing communications. It applies to individuals who are project practitioners working in a project support role.

Competency Unit	Performance Criteria
CU1. Contribute to communications planning	P1. Identify, source and contribute relevant information requirements to initial project documentation P2. Contribute to developing and implementing the project communications plan and communications networks
CU2. Conduct information-management activities	P1. Act on and process project information according to agreed procedures as directed, to aid decision-making processes throughout project life cycle P2. Maintain information to ensure data is secure and auditable
CU3. Communicate project information	P1. Communicate with clients and other stakeholders during project using agreed networks, processes and procedures to ensure flow of necessary information P2. Ensure reports are prepared and released according to authorization, or produced for release by others P3. Seek information and advice from appropriate project authorities as required
CU4. Contribute to assessing effectiveness of communication	P1. Assist in ongoing review of project outcomes to determine effectiveness of communications-management activities P2. Report communications-management issues and responses to higher project authorities for application of lessons learned to future projects

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- Summarize models and methods of communications management in context of project life cycle and other project management functions
- Importance of managing risk by treating information securely
- Methods of reviewing outcomes
- Organizational policies and procedures relevant to this role in a specific context.

Critical Evidence(s) Required



***National Competency Standards Level-5 in Agricultural Machinery
Technology***



The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- Demonstrate managerial and communications plan for IoT product
- Elaborate decision-making processes throughout project life cycle



0716-MVS&A-16. Create human resource management plan

Overview: This unit describes the skills and knowledge required to assist with aspects of human resources management of a project. It involves establishing human resource requirements, identifying the learning and development needs of people working on the project, facilitating these needs being met, and resolving conflict in the team. It applies to individuals who are project practitioners working in a project support role.

Competency Unit	Performance Criteria
CU1. Assist in determining human resource requirements	P1. Analyze work breakdown structure to determine human resource requirements P2. Prepare a skills analysis of project personnel against project task requirements P3. Assist in assigning responsibilities for achieving project deliverables
CU2. Contribute to establishing and maintaining productive team relationships	P1. Actively seek views and opinions of team members during task planning and implementation P2. Promote cooperation and effective activities, goals and relationships within team P3. Communicate with others using styles and methods appropriate to organizational standards, group expectations and desired outcomes P4. Communicate information and ideas to others in a logical, concise and understandable manner P5. Regularly seek feedback on nature and quality of work relationships, and use feedback as basis for own improvement and development
CU3. Assist with human resource monitoring	P1. Monitor work of project personnel against assigned roles and responsibilities within delegated authority levels P2. Monitor and control actual effort against project plan P3. Review skill levels against allocated tasks and recommend solutions, where required, to others P4. Advise others within delegated authority when assigned responsibilities are not met by project personnel P5. Undertake work in a multi-disciplinary environment according to established human resource management practices, plans, guidelines and procedures P6. Resolve conflict within delegated authority according to agreed dispute-resolution processes P7. Assist in offering human resource development opportunities to individuals with skill gaps



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



**CU4. Contribute to
evaluating human
resource practices**

P1. Contribute to assessing effectiveness of project human resources management

P2. Document lessons learned to support continuous improvement processes

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- Alternative project personnel engagement options
- Job design principles and work breakdown structures
- Learning and development approaches that can be incorporated into project life cycle
- Methods for skills analysis
- Project roles, responsibilities and reporting requirements for human resources.

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- Produce the assigned roles and responsibilities of your team within delegated authority levels
- Provide dispute-resolution procedures for an organizations



0716-MVS&A-17. Develop project management plan

Overview: This unit describes the skills and knowledge to develop a plan for a hotel management plan, including assessing project requirements and planning for all stages to completion and final documentation.

Competency Unit	Performance Criteria
CU1. Prepare project management plan	<p>P1. Evaluate and assess project brief and related documents</p> <p>P2. Produce document on project tasks and associated timelines, including installation processes and test requirements</p> <p>P3. Assess and produce document on resource requirements to assist allocation of appropriate resources</p> <p>P4. Produce training plan assessing training needs and associated timelines for efficient project implementation</p> <p>P5. Determine and document budgetary requirements</p> <p>P6. Discuss roles of all identified parties associated with project to ensure their involvement</p> <p>P7. Produce project verification document, including monitoring and control processes, and review processes such as quality audits</p> <p>P8. Consult with all relevant parties prior to finalizing draft plan and make changes as appropriate</p>
CU2. Develop and evaluate management plan	<p>P1. Produce preliminary plan for consultation, including identified factors that may impact on realization of project and observance of relevant legislation, codes, regulation and standards</p> <p>P2. Consult with client and clarify any amendments</p> <p>P3. Develop final plan with recommendations</p>
CU3. Communicate project information	<p>P1. Produce and document final plan to include implementation details and training needs</p> <p>P2. Present plan to client and obtain sign off</p>
CU4. Contribute to assessing effectiveness of communication	<p>P1. Assist in ongoing review of project outcomes to determine effectiveness of communications-management activities</p> <p>P2. Report communications-management issues and responses to higher project authorities for application of lessons learned to future projects</p>

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:



National Competency Standards Level-5 in Agricultural Machinery Technology



- Key attributes of common telecommunications applications and related equipment
- Evaluate the connections to carrier infrastructure or equipment
- Current legislation relating to the design of installation of telecommunications equipment and connection to carrier services
- Advantages of leasing and purchase options to assist in delivering cost effective solutions
- Evaluate network and transmission equipment
- Network topologies, and interface and interconnect solutions
- Workplace health and safety (WHS) issues that need to be built into a plan, with consideration of:
 - electrical safety
 - materials handling
 - physical hazards
 - confined spaces
 - heights
 - lifting
- Evaluate the power requirements and electrical safety aspects of the installation plan
- Performance parameters and typical faults that may be encountered in client equipment and related connection and transmission media
- Various test equipment types suitable for tests to be made
- Warranty information for equipment supplies and contractor work guarantees.

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- Produce training plan assessing training needs and associated timelines for efficient project implementation
- Determine and document budgetary requirements
- Produce project verification document, including monitoring and control processes, and review processes such as quality audits
- Produce and document final plan to include implementation details and training needs
- Present plan to client and obtain sign off



0716-MVS&A-18. Develop sales plan

Overview: This unit describes the skills and knowledge required to develop a sales plan for a product or service for a team covering a specified sales territory based on strategic objectives and in accordance with established performance targets. It applies to individuals working in a supervisory or managerial sales role who develop a sales plan for a product or service.

Competency Unit	Performance Criteria
CU1. Identify organizational strategic direction	P1. Obtain and analyze assessment of market needs and strategic planning documents P2. Review previous sales performance and successful approaches to identify factors affecting performance P3. Analyze information on market needs, new opportunities, customer profiles and requirements as a basis for decision making P4. Carry out competitor analysis for rate structure
CU2. Establish performance targets	P1. Determine practical and achievable sales targets P2. Establish realistic timelines for achieving targets P3. Determine measures to allow for monitoring of performance P4. Ensure objectives of the sales plan and style of the campaign are consistent with organizational strategic objectives and corporate image
CU3. Develop a sales plan for a product	P1. Determine approaches to be used to meet sales objectives P2. Identify additional expertise requirements and allocate budgetary resources accordingly P3. Identify risks and develop risk controls P4. Develop advertising and promotional strategy for product P5. Identify appropriate distribution channels for product P6. Prepare a budget for the sales plan P7. Present documented sales plan to appropriate personnel for approval
CU4. Identify support requirements	P1. Identify and acquire staff resources to implement sales plan P2. Develop an appropriate selling approach P3. Train staff in the selling approach selected P4. Develop and assess staff knowledge of product to be sold
CU5. Monitor and review sales plan	P1. Monitor implementation of the sales plan P2. Record data measuring performance versus sales targets P3. Make adjustments to sales plan as required to ensure required results are obtained

Knowledge & Understanding



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- Outline principles and techniques for selling
- Outline methods for monitoring sales outcomes
- Statistical techniques for analyzing sales and market trends
- Internal and external sources of information that are relevant to identifying organizational strategic direction and developing a product sales plan.
- Competitors intelligence

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- Identify the risks of the product i.e., sale/deployments
- Produce a sales plan for the product
- Demonstrate marketing and selling approach
- Demonstrate advertising and promotional strategy for product



0716-MVS&A-19. Conduct research for customer needs and satisfaction

Overview: This unit describes the skills and knowledge required to manage an ongoing relationship with a customer over a period of time. This includes helping customers articulate their needs and managing networks to ensure customer needs are addressed. It applies to individuals who are expected to have detailed product knowledge in order to recommend customized solutions. In this role, individuals would be expected to apply organizational procedures and be aware of, and apply as appropriate, broader factors involving ethics, industry practice and relevant government policies and regulations.

Competency Unit	Performance Criteria
CU1. Assist customer to articulate needs	P1. Ensure customer needs are fully explored, understood and agreed P2. Explain and match available services and products to customer needs P3. Identify and communicate rights and responsibilities of customers to the customer as appropriate
CU2. Satisfy complex customer needs	P1. Explain possibilities for meeting customer needs P2. Assist customers to evaluate service and/or product options to satisfy their needs P3. Determine and prioritize preferred actions P4. Identify potential areas of difficulty in customer service delivery and take appropriate actions in a positive manner
CU3. Manage networks to ensure customer needs are addressed	P1. Establish effective regular communication with customers P2. Establish, maintain and expand relevant networks to ensure appropriate referral of customers to products and services from within and outside the organization P3. Ensure procedures are in place to ensure that decisions about targeting of customer services are based on up-to-date information about the customer and the products and services available P4. Ensure procedures are put in place to ensure that referrals are based on the matching of the assessment of customer needs and availability of products and services P5. Maintain records of customer interaction in accordance with organizational procedures
CU4. Convert customer enquiries into sales	P1. Use information provided by customers or accessed from the customer relationship management (CRM) system to identify any needs P2. Identify suitable products/services to meet needs P3. Make convincing sales pitches to customers following standard scripts P4. Handle customer queries, objections and rebuttals following standard scripts



National Competency Standards Level-5 in Agricultural Machinery Technology



- P5.** Adapt your approach and style to customer preferences, within the limits of your competence and authority
- P6.** Refer issues outside your area of competence and authority to appropriate people, following your organization's procedures
- P7.** Identify and act on opportunities to up-sell or cross-sell other products/services to customers
- P8.** Confirm customer wishes and needs in order to close sales
- P9.** Obtain required financial information from customers, following your organization's procedures
- P10.** Complete your organization's post-sales procedures in order to complete/ fulfill sales
- P11.** Comply with relevant standards, policies, procedures and guidelines when converting customer enquiries into sales

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- Organizational procedures and standards for establishing and maintaining customer service relationships
- Consumer rights and responsibilities
- Ways to establish effective regular communication with customers
 - Outline details of products or services including with reference to:
 - possible alternative products and services
 - Variations within a limited product and service range

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- Gather customer needs and requirements
- Analyse customer needs and requirements
- Enlist communication rights and responsibilities of customers
- Handle customer relationship management (CRM) model to identify suitable products/services to meet customer needs



0716-MVS&A-20. Manage finances

Overview: This unit of competency describes the outcomes required to develop, implement and monitor a personal budget in order to plan regular savings and manage debt effectively.

Competency Unit	Performance Criteria
CU1. Develop a personal budget	<p>P1. Calculate current living expenses using available information to prepare a personal budget.</p> <p>P2. Keep a record of all income and expenses for a short period of time to help estimate ongoing expenses.</p> <p>P3. Subtract total expenses from total income to determine a surplus or deficit budget for the specified period.</p> <p>P4. Find reasons for a deficit budget and ways to reduce expenditure identified.</p> <p>P5. Identify ways to increase income, if possible</p>
CU2. Develop longer term personal budget	<p>P1. Analyze income and expenditure and set longer term personal, work and financial goals.</p> <p>P2. Develop a longer-term budget based on the outcomes of short-term budgeting, and adjust to meet living, work and future career requirements.</p> <p>P3. Identify obstacles that might affect finances such as job loss, sickness or unexpected expenses contingency savings</p> <p>P4. Formulate a regular savings plan based on budget, using secure savings products and services.</p> <p>P5. Monitor expenditure against budget and identify areas of possible expenditure saving</p>
CU3. Identify ways to maximize future finances	<p>P1. Determine sources and ways to maximize personal income, including from work, investments or available government payments/allowances.</p> <p>P2. Get further education or training to maintain or improve future income.</p> <p>P3. Identify the need for debt to finance living and other expenses, and determine the appropriate levels of debt and repayment.</p> <p>P4. Consolidate existing debt, where possible, to minimize interest costs and fees.</p> <p>P5. Seek professional money management services, where available, to ensure financial plans are effective and achievable</p>

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:



***National Competency Standards Level-5 in Agricultural Machinery
Technology***



- Abilities to plan and organize to keep records and monitor a personal budget
- Abilities to set and review goals
- Basic financial management and record keeping to enable development and management of a personal budget
- Benefits of financial goal setting and personal budgeting to enable effective management of personal finances
- Numeracy skills to compare income and expenditure

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:

- Produce a longer-term budget based on the outcomes of short-term budgeting
- Develop and report the need for debt to finance living and other expenses,
- Determine the appropriate levels of debt and repayment
- Demonstrate the ways to increase finances and income



0716-MVS&A-21. Identify and resolve problems

Overview:

This unit is focus on negotiation in critical incidents and the development of strategic responses designed to resolve threatening incidents.

Competency Unit	Performance Criteria
CU1. Identify a problem	P1. Form a problem statement and analyze root cause. P2. Take initiative in tackling problems rather than relying solely on directives P3. Follow logic steps in understanding root cause and analyzing potential solutions.
CU2. Determine strategies for a required solution	P1. Analyze all aspects of the incident for degree of hazard, priorities, optional outcomes and appropriate strategies P2. Analyze and determine strategies and priorities on the incident sought from a range of sources P3. Assess long term objectives against resources and priorities P4. Apply a range of communication techniques to make and maintain contact with the key people P5. Provide clear and factual information to enable an honest and realistic assessment of the interests of the key people and their positions P6. Resolve the conflict and express their likely consequences clearly and do an analysis of the benefits P7. Reassess points of disagreements for common positive Positions
CU3. Coordinate support CU4. services	P1. Assess the need for support services in terms of the determined strategies and priorities P2. Negotiate the resources of support services according to established procedures and availability P3. Provide information on strategies to support services and maintain the communication P4. Delegate roles and responsibilities according to expertise and resources
CU5. Restore order	P1. Assess the incidents for degree of risk and take appropriate action to reduce and remove the impact of the incident and restore order P2. Take action designed to minimize risk and the preserve the safety and security of all involved P3. Take action to prevent the escalation of the incident appropriate to the circumstances and agreed procedures. P4. Carry out the use of force for the restoration of control and the



**National Competency Standards Level-5 in Agricultural Machinery
Technology**



	<p>maintenance of security in the least restrictive manner.</p> <p>P5 .Complete reports accurately and clearly provided to the appropriate authority promptly</p> <p>P6 .Review, evaluate and analyze the incident and the organizational response to it and report it promptly and accurately.</p>
CU6. Provide leadership, direction and guidance to the work group	<p>P1 .Link between the function of the group and the goals of the organization</p> <p>P2 .Participate in decision making routinely to develop, implement and review work of the group and to allocate responsibilities where appropriate</p> <p>P3 .Give opportunities and encouragement to others to develop new and innovative work practices and strategies</p> <p>P4 .Identify conflict and resolve with minimum disruption to work group function</p> <p>P5 .Provide staff with the support and supervision necessary to perform work safely and without risk to health</p> <p>P6 .Allocate tasks within the competence of staff and support with appropriate authority, autonomy and training</p> <p>P7 .Supervise appropriately the changing priorities and situations and takes into account the different needs of individuals and the requirements of the task</p>

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes:

- Organization's policies, guidelines and procedures related to control and surveillance, safety and preventing and responding to incidents and breaches of orders covered in the range of variables.
- Organization's management and accountability systems
- Teamwork principles and strategies
- Principles of effective communication
- Guidelines for use of equipment and technology
- Code of conduct

Critical Evidence(s) Required

The candidate needs to produce following **Critical Evidence(s)** in order to be competent in this competency standard:



***National Competency Standards Level-5 in Agricultural Machinery
Technology***



- Identify problem statement
- Build team
- Identify your target community for the proposed product/solution
- Analyze product sale and marketing plan
- Provide your strategy to execute entrepreneurial plan
- Provide three solutions (A, B, C) of your business plan
- Present complete portfolio of entrepreneurial plan as an evidence
- Provide clear and factual information to enable an honest and realistic assessment of the interests of the key people and their positions
- Provide information on strategies to support after sale services
- Provide a complete entrepreneurial plan