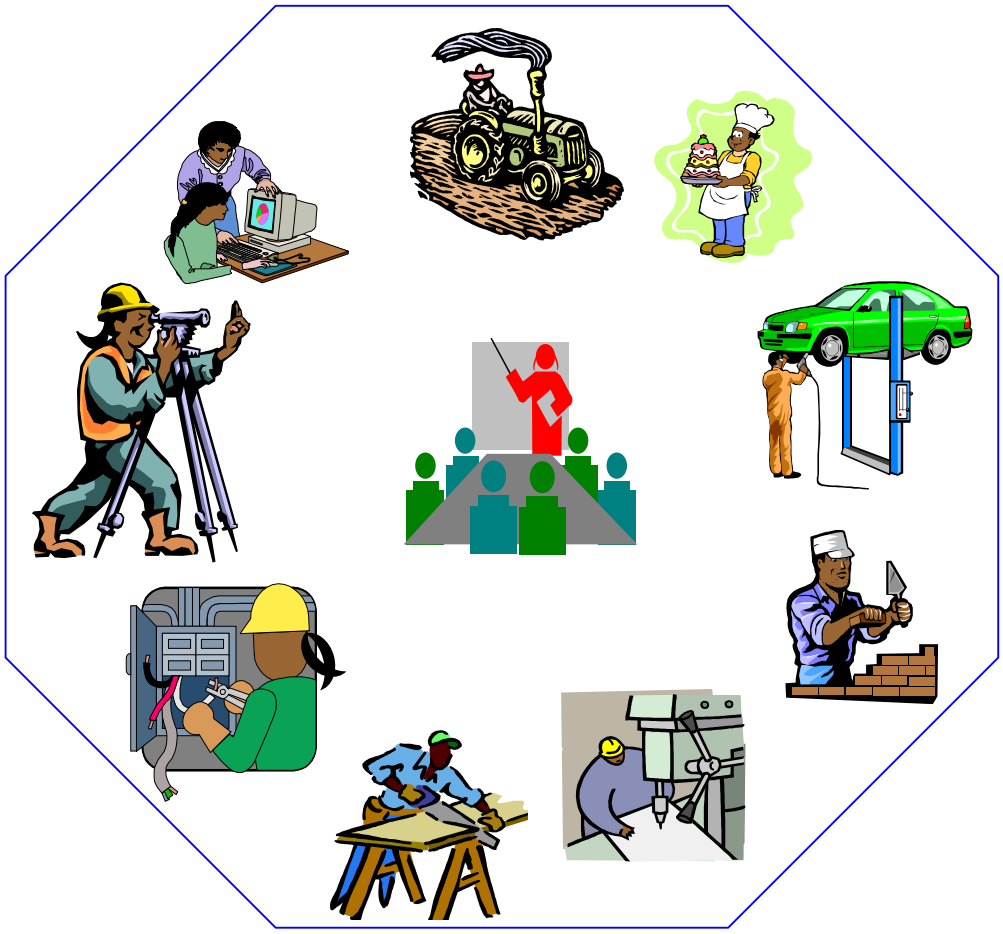
Federal Democratic Republic of Ethiopia
OCCUPATIONAL STANDARD

BOGIE AND BODY PRODUCTION AND ASSEMBLY MANAGEMENT

NTQF Level V



Ministry of Education
January 2017

Introduction

Ethiopia has embarked on a process of reforming its TVET-System. Within the policies and strategies of the Ethiopian Government, technology transformation – by using international standards and international best practices as the basis, and, adopting, adapting and verifying them in the Ethiopian context – is a pivotal element. TVET is given an important role with regard to technology transfer. The new paradigm in the outcome-based TVET system is the orientation at the current and anticipated future demand of the economy and the labor market.

The Ethiopian Occupational Standard (EOS) is the core element of the Ethiopian National TVET-Strategy and an important factor within the context of the National TVET-Qualification Framework (NTQF).They are national standards, which define the occupational requirements and expected outcome related to a specific occupation without taking TVET delivery into account.

This document details the mandatory format, sequencing, wording and layout for the Ethiopia Occupational Standard which comprised of Units of Competence.

A Unit of Competence describes a distinct work activity. It is documented in a standard format that comprises:

- Occupational title, NTQF level
- Unit title
- Unit code
- Unit descriptor
- Elements and Performance criteria
- Variables and Range statement
- Evidence guide

Together all the parts of a Unit of Competence guide the assessor in determining whether the candidate is competent.

The ensuing sections of this EOS document comprise a description of the occupation with all the key components of a Unit of Competence:

- chart with an overview of all Units of Competence for the level including the Unit Codes and the Unit of Competence Titles
- contents of each Unit of Competence listed in the chart
- occupational map providing the Technical and Vocational Education and Training (TVET) providers with information and important requirements to consider when designing training programs for this standards and for the individual, a career path

UNIT OF COMPETENCE CHART

Occupational Standard: Bogie and Body Production and Assembly Management

Occupational Code: IND BPM5

NTQF Level V

IND BPM5 01 0117 Read and Interpret Engineering Drawings and Determine Requirements	IND BPM5 02 0117 Manage Project Cost and Document Manufacturing Design Processes	IND BPM5 03 0117 Manage Facility and Inventory Requirements
IND BPM5 04 0117 Manage Project Integration	IND BPM5 05 0117 Manage Project Risks	IND BPM5 06 0117 Select Nonmetallic Materials for Engineering Applications
IND BPM5 07 0117 Select Metal Forming Process	IND BPM5 08 0117 Select Metal Forming Process	IND BPM5 09 0117 Perform Leveling and Alignment of Machines and Engineering Components
IND BPM5 10 0117 Manage People Performance	IND BPM5 11 0117 Undertake Project Work	IND BPM5 12 0117 Ensure Team Effectiveness
IND BPM5 13 0117 Manage Complex Projects	IND BPM5 14 0117 Prepare Technical Reports	IND BPM5 15 0117 Optimize Production Systems
IND BPM5 16 0117 Investigate Consumer Complaints	IND BPM5 17 0117 Contribute to the Development of Products or Processes	IND BPM5 18 0117 Manage Project Quality
IND BPM5 19 0117 Facilitate and Capitalize on Change and Innovation	IND BPM5 20 0117 Manage Continuous Improvement Process (Kaizen)	

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Read and Interpret Engineering Drawings and Determine Requirements**
Unit Code	**IND BPM5 01 0117**
Unit Descriptor	This unit describes the performance outcomes required to determine production processes and materials from engineering drawings and specification sheets. It applies to individuals in train manufacturing environment and involves the application of skills and knowledge at a specialist level This unit describes the performance outcomes required to read and interpret a work order and working drawings in bogie manufacturing processes. It applies to those in train manufacturing environment and involves the application of skills and knowledge at a production level.

Elements	Performance Criteria
1. Plan and prepare	1.1. Symbols, codes, legends and diagrams in engineering drawings are identified 1.2. Manufacturing information, products, systems and components represented in engineering drawings are identified and interpreted 1.3. Work requirements are determined and confirmed with appropriate personnel
2. Determine processes	2.1. Specific customer and job requirements are identified 2.2. Manufacturing processes are identified from drawing, and materials are selected according to customer requirements and workplace procedures
3. Complete work processes	3.1. Production order is prepared according to engineering drawings and workplace procedures 3.2. Engineering drawing outcomes and workplace documents are recorded and engineering drawings are stored according to Work place procedures
4. Review work order and working drawings	4.1. Set of instructions associated with ***work order*** is obtained and reviewed according to ***workplace procedures*** 4.2. Symbols, codes, legends and diagrams in the working drawing are identified 4.3. Products, systems, components and items represented in the working drawing are identified 4.4. ***Job specifications*** are identified and confirmed

5. Interpret working drawings	5.1 Required materials and equipment are determined from drawing, using suitable information sources 5.2 Required specifications and drawing types are identified 5.3 Material, equipment and production time are estimated
6. Check that working drawings reflect work order	6.1 Drawing is checked to confirm that it represents specifications in work order 6.2 Drawing is stored for later retrieval according to workplace procedures 6.3 Workplace documents are completed according to workplace procedures 6.4 Outcomes of check are recorded and stored according to workplace procedures

Variable	Range
Work order	Must include: • description of job • job specifications • working drawings.
Workplace procedures	Must include: • continuous improvement practices • environmental requirements • quality guidelines • Recording and reporting.
Job specifications	Must include • customer requirements • Original Equipment Manufacturer (OEM) procedures • Material requirements.

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • identify job requirements from engineering drawings • identify and select appropriate production processes and material requirements according to engineering drawings, workplace procedures and Work Health and Safety (WHS) requirements • determine production timelines • Produce production work orders.
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • Workplace procedures relating to reading and interpreting engineering drawings • Types, applications and layout of engineering drawings, including: ➢ codes ➢ symbols ➢ legends ➢ diagrams

	• Procedures for determining materials, production processes and production timelines from engineering drawings and job specifications • Procedures for preparing production work orders
Underpinning Skills	Demonstrate skills to: • interpret engineering drawings, job specifications and workplace procedures • identify customer requirements • Legibly prepare production work orders. • plan and organize the job, choosing from different options, identifying possible risks, and calculating and accessing relevant resources • locate explicit information in work orders, job specifications and working drawings
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Manage Project Cost and Document Manufacturing Design Processes**
Unit Code	**IND BPM5 02 0117**
Unit Descriptor	This unit describes the performance outcomes required to document the design details of the production processes of vehicles and their components. It applies to those in train manufacturing and related manufacturing environment and involves the application of skills and knowledge at a specialist level This unit describes the performance outcomes, skills and knowledge required to identify, analyse and refine project costs to produce a budget, and to use this budget as the principal mechanism to control project cost. This unit applies to those responsible for managing and leading a project in an organisation, business or as a consultant. The project manager operates according to assigned authority levels, and is responsible for own performance and the performance of others. The project manager may undertake the work in the context of an organisational program and/or portfolio of projects. This unit has generic application for projects in a range of industries, organisations and contexts. In the context of this unit a project is defined as involving: • a comprehensive, detailed and integrated project management plan • a formal communications plan • a dedicated and project-based budget • formal and planned engagement with a wide range of stakeholders • a documented risk, issues and change-management methodology • a quality plan with assurance and control processes • A project team-based environment.

Elements	Performance Criteria
1. Identify document needs	1.1. Design brief and ***requirements*** are identified and confirmed with appropriate personnel 1.2. Production processes, drawings, technical specification and instructions are identified and clarified with participating personnel
2. Develop draft	2.1. Draft ***documents*** relating to the specification, costing,

documents	manufacture and assembly of products are prepared according to workplace procedures 2.2. Draft document content is confirmed with relevant personnel and their feedback integrated as appropriate
3. Finalise documentation process	3.1. Approved documents are communicated to relevant production, management and engineering personnel 3.2. Documents are distributed and stored according to workplace procedures
4. Determine project costs	4.1. Determine ***resource requirements*** for individual tasks are identified in the work breakdown structure, with input from stakeholders and guidance from ***others*** 4.2. Estimate ***project costs*** to enable project budget to be prepared within agreed tolerances 4.3. A project budget is developed 4.4. A cost-management plan is developed within ***delegated authority***, to ensure clarity of understanding and ongoing management of project finances
5. Monitor and control project costs	5.1. Agreed ***financial-management processes and procedures*** are implemented to monitor actual expenditure against budget 5.2. Cost-analysis methods and tools are selected and used to identify cost variations and evaluate alternative actions 5.3. Agreed actions are implemented and monitored to maintain financial objectives 5.4. Financial reports are provided accurate and timely
6. Complete cost-management processes	6.1 Appropriate activities are conducted to signify ***financial completion*** 6.2 Project outcomes are ***reviewed*** using available ***records*** to determine the effectiveness of project cost management 6.3 Cost-management issues are reviewed and improvements documented

Variable	Range
Requirements	Must include: • design quality • materials • production processes • Testing and costing.
Documents	Must include: • budgets • material requirements

	• production processes • resources • specified parameters • test requirements • Timelines.
Resource requirements	May include: • equipment • facilities • fees and charges • human resources • materials • services • Statutory costs.
Others	May include: • program manager • project specialists • relevant project authority • subject matter experts • team members.
Project costs	Are estimated considering: • contingencies to allow for identified risks and uncertainty • degree of accuracy required (tolerance levels) • information available at the time • organisational requirements, for example overhead and profit margin • work breakdown structure.
Delegated authority	Means that activities will: • be conducted routinely or as changing circumstances dictate • be done independently within broad guidance • involve consultation with other project members, teams and internal stakeholders • involve taking a lead role in a team where required • involve the selection, use and supervision of appropriate cost-management methods, tools and techniques • Take into account internal organisational change and external environmental change.
Financial-management processes and procedures	May include: • approval processes • communication and reporting processes • financial authorisations and delegations • invoice procedures • Organisational chart of accounts links.
Financial completion	May include: • allocations and distributions • final payments • financial reports • organisational project accounting procedures

	• project accounts finalisation • Variations statement.
Review	May include evaluations: • agreed major milestones, for example phases and subcontracts • change of key personnel • contingencies • delivery of major deliverables • finalisation of project and other agreed milestones • Variations.
Records	May include: • budgets, commitment and expenditure • cash flows • cost-management lessons learned • cost-management plans • invoice and payment summaries • lists of potential costs • project and/or organisational files and records • quotations • recommended and approved courses of action • Reports to relevant stakeholders.

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • comply with workplace procedures when designing production documents • apply working knowledge of production practices and systems • identify design requirements • communicate with internal personnel to seek their input into and approval of documents • design and modify documents • incorporate design quality, materials, production processes, testing and costing into document design process • complete, disseminate and store design document • applying budgetary processes, tools and techniques relevant to the project context • monitoring project costs across the project life for a project of sufficient complexity to demonstrate the full range of performance requirements • Preparing a budget for a project.
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • workplace documents covering procedures, specifications, schedules, quality instructions, procedures and performance indicators • workplace communication protocols for developing and disseminating design documentation

	• processes to identify design requirements • processes to identify critical product quality, materials, tests and costing • Processes for developing and storing documents. • budgeting processes, tools and techniques • methods and tools for costing and cost analysis
Underpinning Skills	Demonstrate skills to: • interpret production and work area requirements • interpret workplace procedures and product specifications • Interpret design brief. • legibly complete design documents • communicate and negotiate with workplace personnel on document design and content • use workplace computer programs and design applications • adapt to document design requirements • Manage document research, design and development time. • identify problems, particularly in production, to meet performance indicators • Access, interpret and apply workplace procedures and instructions to ensure documents meet workplace template requirements and standards. • work in a design consultation process • analytical skills to evaluate processes and recommend improvements • numeracy and budgeting skills to monitor expenditure and manage project costs • technology skills to use software for recording expenditure and reporting on the project budget and costs
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning • Train manufacturing workplace or simulated workplace • Real or simulated automotive production document requirements • Bogie production document design brief and development instructions • Computer system and design software • Workplace procedures relating to the design of automotive production documents. • Where assessment of competency includes third-party

	evidence, individuals must provide evidence that links them to the train production documents that they have designed, e.g. a copy of the direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate • oral or written questioning to assess knowledge of strategies for managing project costs and their application in different situations • analysis of responses addressing case studies and scenarios that present issues and problems in project cost management • review of developed and implemented cost-management plan • Review of documentation about project outcomes, cost-management issues and identified improvements. • Production documents. • Assessors must verify performance evidence through questioning on skills and knowledge to ensure correct interpretation and application. • The following resources must be made available:
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting. • Access to workplace documentation, including budgets and other financial documents • Consideration of feedback from project stakeholders on how costs were managed.

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Manage Facility and Inventory Requirements**
Unit Code	**IND BPM5 03 0117**
Unit Descriptor	This unit involves the skills and knowledge required to manage a facility and its inventory requirements. It includes identifying space, safety and security requirements; developing a documentation system; designing storage zones; and evaluating facility utilisation. Work may be undertaken in various contexts within the transport and logistics industry. This unit generally applies to those who provide leadership of others individually or in teams. This unit covers using inventory procedures and requisitioning goods. The unit applies to the administration of inventory procedures using manual or electric systems to support or maintain stores or inventory systems, for example Just-in-Time or KANBAN systems. Where routine activity within standard operating procedure is undertaken.

Elements	Performance Criteria
1. Identify space requirements	1.1. The medium-term and long-term storage needs of the 1.2. organisation are assessed to facilitate planning in accordance with the business plan of the enterprise and legislative requirements 1.3. Product type, picking frequencies, value, fragility, weight, handling characteristics, quantity and holding periods are assessed to consider type and amount of storage 1.4. Facility is assessed to determine the stock holding and handling requirements for each inventory item 1.5. Volume requirements are calculated to ensure that ongoing stock holding needs are met 1.6. The total space requirement is calculated and used to formulate plan for space utilisation
2. Identify safety and security requirements	2.1. An assessment is made of risks to ensure maximum safety and security for personnel, stock and facilities 2.2. Storage handling security and incident/emergency procedures for each class or type of product are identified and documented 2.3. Fire prevention and fire fighting systems are identified

	in accordance with building code regulations and storage material requirements 2.4. An evacuation plan is developed in accordance with the safety program of the enterprise
3. Develop documentation system	3.1. A system for recording and tracing stock location, receival, throughput and despatch is developed and implemented to enable reporting, quality assurance and financial requirements to be met 3.2. A system for recording communication with carriers, customers and employees is developed and implemented to assess operational effectiveness and to provide data for system improvement
4. Design storage zones	4.1. Space requirements and equipment operation are accurately assessed to facilitate the planning of warehouse zones 4.2. An assessment is made of the facility to enable the most effective use of available space 4.3. Positioning of storage areas, bays, work stations and the like is undertaken in accordance with data obtained from the planning process 4.4. Provision for maintenance and cleaning is catered
5. Evaluate facility utilisation	5.1. A continual system of review is used involving regular checks to ensure storage areas and systems are functioning at optimum levels 5.2. Receiving and despatch systems provide efficient operations 5.3. Storage and handling systems provide ease of access and comply with ergonomic principles 5.4. Product handling and storage minimises product damage, contamination and stock losses 5.5. Facility layout remains sufficiently flexible to meet changing storage and handling requirements 5.6. Appropriate reporting systems are established and used to maintain data for the design of improved facilities and systems
6. Use inventory procedures	6.1 Inventory procedures are applied to standard operational procedures. 6.2 Requisition, purchase, shipping and invoice documentation is used as required to standard operational procedures. 6.3 Inward/outward recording/filing system is accessed and maintained to standard operational procedures.

	6.4 Customer orders are maintained to standard operational procedures. 6.5 Returned orders are booked back using standard operational procedures.
7. Requisition goods	7.1 Requisition procedures are applied to standard operational procedures. 7.2 Goods are requisitioned on time. 7.3 All recording is completed and filed correctly in accordance with site procedures.

Variable	**Range**
The workplace environment	May involve: • twenty four hour operation • single and multi site location • large, medium and small companies
Depending on the organisation concerned, workplace procedures	May be called: • Standard Operating Procedures (SOPs) • company procedures • enterprise procedures • organisational and established procedures
Communication in the work area	May include: • phone • Electronic Data Interchange (EDI) • fax • email • internet • RF systems • oral, aural or signed communications
Consultative processes	May involve: • other employees and supervisors • relevant authorities and institutions • management and union representatives • industrial relations and OHS specialists • customers and suppliers • other professional or technical staff, contractors and maintenance personnel
Documentation and records	May include: • regulations and codes of practice relevant to the functions of a storage facility, including the ADG code, fire safety and fire fighting regulations, building code regulations, storage and handling procedures, and security procedures relevant to the specific facility • relevant OHS and environmental protection regulations • quality assurance procedures • emergency procedures, particularly in relation to fire and evacuation

	• operations manuals, job specifications and induction documentation relevant Ethiopian Standards and certification requirements
Applicable legislation and regulations	May include: • Ethiopian and international regulations and codes of practice for the transport of dangerous goods and hazardous substances • relevant state/territory OHS and environmental protection legislation • building codes, fire safety and fire fighting codes and regulations
Inventory procedures	Inventory systems such as Just-in-Time or KANBAN systems

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • Focus of operation of warehouse systems, resources, management and workplace operating systems • Enterprise business policies and plans including procedures for operations of the facility
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • Throughput and storage requirements for specific types of inventory • Principles, purpose and location of controls, monitoring devices, and systems • Selection and appropriate application of technology, information systems and procedures • Procedures for operating electronic communications equipment • Requirements for completing relevant documentation • Procedures for managing and controlling hazardous situations when carrying out work activities • particularly those that relate to the storage of materials • inventory procedures • safe work practices and procedures • use and application of personal protective equipment • hazards and control measures associated with administering inventory procedures • measurement techniques, tools and equipment for administering inventory procedures
Underpinning Skills	Demonstrate skills to: • Communicate effectively with others when managing facility and inventory requirements • Read and interpret plans, diagrams, regulations, codes of practice and other documentation • relevant to the management of facilities and inventory requirements • Adapt appropriately to cultural differences in the

	workplace, including modes of behavior and interactions with others • Promptly report and or rectify any identified problems that may arise during the planning and management of facilities and inventory requirements • Develop and implement contingency plans for unplanned events which may arise during the management of facilities and inventory requirements • Apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities • Provide leadership to others when managing facilities and inventory requirements • Select and apply appropriate technology, information systems and procedures when managing facility and inventory requirements • Prioritise work and coordinate the work of others • reading, interpreting and following information on requisition, purchase, shipping and invoice documentation, standard operating procedures, charts, lists and other applicable reference documents • accessing and maintaining manual and electronic inventory information • undertaking numerical operations and calculations within the scope of this unit • organising information • recording and filing information • managing time • checking for conformance to specifications • measuring to specified tolerances • entering information on to manual and electronic • proformas and standard workplace documents
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. • relevant and appropriate materials and equipment, and • applicable documentation including workplace procedures, regulations, codes of practice and operation manuals
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning • through activities in an appropriately simulated environment at the registered training organisation, and/or • in an appropriate range of situations in the workplace
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

	• a range of relevant exercises, case studies and/or other simulated practical and knowledge assessment, and/or • access to an appropriate range of relevant operational situations in the workplace

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Manage Project Integration**
Unit Code	**IND BPM5 04 0117**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to integrate and balance the overall project management functions of scope, time, cost, quality, human resources, communications, risk and procurement across the project life cycle; and to align and track the project objectives to comply with organisational goals, strategies and objectives This unit applies to those responsible for managing and leading a project in an organisation, business or as a consultant. The project manager operates within assigned authority levels, and is responsible for own performance and the performance of others. The project manager may undertake the work in the context of an organisational program and/or portfolio of projects

Elements	Performance Criteria
1. Establish project	1.1. ***Project initiation documentation*** are identified, clarified and prepared 1.2. The relationship between the project and ***broader organisational strategies and goals*** is identified 1.3. Project ***objectives, outcomes and benefits*** are negotiated and documented 1.4. The ***project governance structure*** is negotiated with relevant authorities and stakeholders 1.5. ***Project charter*** is prepared and submitted for approval by relevant authorities
2. Undertake project planning and design processes	2.1. A methodology is established and implemented to disaggregate project objectives into achievable ***project deliverables*** 2.2. Project stages and key requirements are identified for stage completion against client requirements and project objectives 2.3. ***Project management functions*** are analysed to identify interdependencies and the impact of the ***triple constraints*** 2.4. A ***project management plan*** that ***integrates*** all project-management functions with ***associated plans and baselines*** is developed

	2.5. Designated mechanisms are established to monitor and control planned activity 2.6. Approval of project plan is negotiated with relevant stakeholders and project authority
3. Execute project in work environment	3.1. The project is managed in an established ***internal work environment*** to ensure work is conducted effectively throughout the project 3.2. Established links are maintained to align project objectives with organisational objectives throughout the project life cycle 3.3. Conflicts that may negatively affect project objectives are resolved within authority levels
4. Manage project control	4.1. Ensure project records are updated against project deliverables and plans at required intervals 4.2. ***Status reports*** on project progress are analysed and submitted and issues identified with stakeholders and relevant authorities 4.3. ***Impact analysis*** is analysed and submitted on change requests for approval where required 4.4. Relevant ***project logs and registers*** are maintained accurately and regularly to assist with project audit 4.5. Ensure associated plans are updated to reflect project progress against baselines and approved changes
5. Manage project finalisation	5.1. ***Project finalisation activities*** are identified and allocated 5.2. Ensure project products and ***associated documentation*** are prepared for handover to client in a timely manner 5.3. Financial, legal and contractual obligations are finalised 5.4. ***Project review assessments*** are undertaken as input to future projects

Variable	Range
Project initiation documentation	May include: • agreed project management framework • agreed project methodology • client or customer requirements • concept proposal • contract documentation • executive team instructions • feasibility study • life cycle approval gateways

	• Output from prior project.
Broader organisational strategies and goals	May include: • market focus • organisational mission statement • strategy plans • values and ethics
Objectives, outcomes and benefits	May include: • expected benefits to be achieved for organisation and business • measurable project product statement • Short and long-term outcomes for the organisation.
Project governance structure	May include: • boards, committees, working groups, reference groups, advisory groups, sponsors, project managers, project team members and stakeholders • identified authority levels assigned to groups and individuals • issue-escalation procedures • project organisation chart • Statements of roles for project management bodies and participants.
Project charter	May include: • approvals and sign-off • broad stakeholder identification • consolidated Project Initiation Documentation (PID) • documented objectives • high-level product deliverables • high-level risk assessment • project assumptions and constraints • project mandate • Source of project authority.
Project deliverables	May include: • definable product, service or document • discrete components of the overall project outputs • specified products of the project • time, quality and cost.
Project management functions	May include: • communications • cost • human resources • procurement and contracting • project integration • quality • risk • scope • time.
Triple constraints	May include: • cost

	• scope and quality • time.
Project management plan	May include: • a covering document that integrates the planning requirements of the nine functions of project management • In single or multiple document format.
Integrates	Decisions that: • determine comparative value • evaluate competing interests • make trade-offs • processes and activities that: • combine • coordinate • define • identify • unify
Associated plans and baselines	May include: • communications plan (stakeholders and information) • human resources plan • procurement plan • project budget • project schedule • quality-management plan • risk plan • Scope-management plan.
Internal work environment	May include: • organisational policy and procedures • organisational culture and style • physical working conditions • geographic location and/or dispersion • Team dynamics.
Status reports	May include: • client progress reports • internal or external • regular consolidated reports to project authority • reports under contractual obligations • Specific budget and schedule reports.
Impact analysis	May include: • assessment against project quality requirements • forecasting against triple constraints (scope, time and cost) • review of project baselines against proposed change.
Project logs and registers	May include: • change log • daily log • issues log

	• quality log • risk register • task-completion log • version-control log.
Project finalisation activities	May include: • completing financial transactions • consolidating and storing project data • documenting outstanding project issues • obtaining or providing certifications • preparing final project reports • updating organisation knowledge management.
Associated documentation	May include: • 'as built' design specifications • certificates, guarantees, indemnities and warranties • product or service specifications • User, training and installation manuals.
Project review assessments	May include: • benefits realisation review • outcomes evaluation • post-implementation review • Project lessons learned.

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • identifying and aligning project with organisational objectives • conducting project establishment processes • managing preparation of a project management plan for a project of sufficient complexity to demonstrate the full range of performance requirements • ensuring project registers and logs are maintained • analysing project reports • undertaking impact analysis preparing strategy for project finalisation
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • project governance models • project knowledge areas • project life cycle stages, phases and structures relevant to industry and project context • types of organisational documentation for strategies and goals.
Underpinning Skills	Demonstrate skills of: • decision-making skills between competing interests and priorities • literacy skills to interpret and develop complex project plans and documentation • negotiating skills to work with stakeholders and project authorities on agreed plans and processes

	• numeracy skills to conduct complex forecasting • planning and organising skills to: • plan, monitor and respond to project issues • measure progress against agreed plans • team leadership and communication skills to liaise with other members of the project team • technology skills to use common software and work office products for documentation and analysis • time-management skills to ensure priorities are addressed.
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate • analysis of responses addressing different project scenarios • oral or written questioning to assess knowledge of project life cycle processes relevant to the industry sector and project context • assessment of management of the project life cycle processes
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting. Assessment must ensure access to: • project documentation, which includes information about participation in life cycle and integration processes.

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Manage Project Risks**
Unit Code	**IND BPM5 05 0117**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to manage risks that may impact on achieving project objectives. It involves identifying, analysing, treating and monitoring project risks, and assessing risk-management outcomes This unit applies to those responsible for managing and leading a project in an organisation, business or as a consultant. The project manager operates within assigned authority levels, and is responsible for own performance and the performance of others. The project manager may undertake the work in the context of an organisational program and/or portfolio of projects. This unit has generic application for projects in a range of industries, organisations and contexts. In the context of this unit a project is defined as involving: a comprehensive, detailed and integrated project management plan • a formal communications plan • a dedicated and project-based budget • formal and planned engagement with a wide range of stakeholders • a documented risk, issues and change-management methodology • a quality plan with assurance and control processes • a project team-based environment.

Elements	Performance Criteria
1. Identify project risks	1.1. Risk objectives and ***standards*** are determined with input from stakeholders 1.2. ***Project risk context*** are established to inform risk-management processes 1.3. ***Project risks*** are identified using valid and reliable ***risk identification methods*** 1.4. Project risks are classified within agreed ***risk categories***
2. Analyse project risks	2.1. Risk-analysis classification criteria is determined and

	applied to an agreed ***risk-ranking system***
	2.2. Risk-analysis processes are used within ***delegated authority*****,** to analyse and qualify risks, threats and opportunities
	2.3. Risk priorities are determined in agreement with project client and other stakeholders
	2.4. Risk-analysis outcomes are documented for inclusion in risk register and ***risk-management plan***
3. Establish risk treatments and controls	3.1. Existing ***risk controls*** are identified and documented
	3.2. ***Risk-treatment options*** are considered and determined using agreed consultative methods
	3.3. Agreed risk treatments are recorded and implemented
	3.4. Risk plans are updated and risk responsibilities allocated to project team members
4. Monitor and control project risks	4.1. Regular ***risk-review processes*** are established to maintain currency of risk plans
	4.2. Risk environment is regularly monitored to identify changed circumstances that impact on project risks
	4.3. ***Risk responses*** are determined to changed environment
	4.4. Agreed risk responses are implemented and plans modified to maintain currency of risk treatments and controls
5. Assess risk-management outcomes	5.1. Project outcomes are reviewed to determine effectiveness of risk-management processes and procedures
	5.2. Risk-management issues and recommended improvements are identified and documented for application to future projects

Variable	**Range**
Standards	May include: • Ethiopian and international standards • enterprise and industrial agreements • industry codes of practice • industry standards • organisational and industrial agreements • organisational policies, systems and procedures • regulations and legislation.
Project risk context	May include: • legislation and regulation controls • nature of project • organisational risk policies and procedures

	• project environment • stakeholder expectations.
Project risks	May include: • predicted future events • threats • opportunities • hazards.
Risk-identification methods	May include: • conducting or supervising qualitative and/or quantitative risk analysis, such as schedule simulation, decision analysis, contingency planning and alternative strategy development • lessons learned from previous projects • personal experience input • previous risk registers • risk workshops • subject matter experts • using specialist risk-analysis tools to assist in the decision-making process.
Risk categories	May include: • communications • compliance • consultative • environmental • finance • health and safety • human resources • legal • organisational brand • physical • political • project assumptions • project constraints • project process risks • quality • social and technology.
Risk-ranking system	May include: • classification rankings from low to high • consequence of risk scale • impact of risk scale • manual or software-based systems • organisational risk policies and methods • predetermined ranking criteria • target and trigger settings.
Delegated authority:	Refers to planning and activities that may: • be conducted routinely or as changing circumstances dictate

	• be done independently within broad guidance • involve consultation with other project members, teams and internal stakeholders • involve taking a lead role in a team where required • involve the selection, use and supervision of appropriate risk-management methods, tools and techniques.
Risk-management plan:	May include • Audit trail for risk management over project life cycle • format of information • organisation systems and risk methods • manual and computerised systems • risk register • summary outcome of risk processes.
Risk controls	May include: • accepted industry practice and codes of conduct • existing risk planning actions • legislation or regulation over processes • modifications to plans and processes • organisational risk policies and procedures • quality systems • work methods.
Risk-treatment options	May include: • accept risk • mitigate risk • transfer or share risk • avoid risk.
Risk-review processes	May include: • gateway or stage transition reviews • ongoing through team member assigned responsibility • regular risk discussions at project meetings • scheduled formal reviews.
Risk responses	May be made: • in consultation with project team members, section heads, project managers and stakeholders • independently or with endorsement of higher project authority if necessary • regularly throughout the project life cycle • taking into account internal organisational change and external environmental change.

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • effective risk management for a project of sufficient complexity to demonstrate the full range of performance requirements • applying risk-management techniques, strategies and tools.

Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • industry sector risk classifications • organisation and industry standard risk frameworks • Quantitative and qualitative risk-management techniques, tools and approaches.
Underpinning Skills	Demonstrate skills to: • analytical skills to review project outcomes in terms of risk management • lateral thinking skills to identify and analyse risks and risk controls • literacy skills to produce risk-management plans • planning and organising skills to monitor project progress • Problem-solving skills to control risks.
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning • direct questioning combined with review of portfolios of evidence and third-party workplace reports of on-the-job performance by the candidate • oral or written questioning to assess knowledge of the risk-management framework • analysis of responses in addressing case studies and scenarios that present issues and problems in project risk management • review of risk-management plans • evaluation of monitoring of progress against project plans • Assessment of identified and documented risk issues and recommended improvements.
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting. Assessment must ensure: • access to workplace risk-management documentation consideration of feedback from project stakeholders as to how risks were managed

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Select Nonmetallic Materials for Engineering Applications**
Unit Code	**IND BPM5 06 0117**
Unit Descriptor	This unit covers recognising common non-metallic materials used in engineering, assisting in the selection of a material for a specific application, and using test results to evaluate the properties of materials This unit applies to metallurgist technician level activities in manufacturing and engineering environments where the metallurgist is also required to select or assist in the selection of non metallic materials.

Elements	Performance Criteria
1. Identify common non-metallic engineering materials by their principal properties	1.1. The principal properties of thermosetting and thermoplastic polymers are identified. 1.2. The principal properties of ceramics and composite materials are identified. 1.3. The effects of different types of bonding in materials are identified. 1.4. The effects of mechanical and thermal processes on the principal properties of materials are identified.
2. Select non-metallic materials for specific applications	2.1. The engineering requirement for the specific application is determined in consultation with others. 2.2. Material is selected based on the requirement and consideration of principal properties and further processing. 2.3. Selection is confirmed according to ***standard*** operating procedures
3. Verify selected non-metallic material as fit for purpose	3.1. ***Appropriate tests*** for the ***required properties*** are identified. 3.2. Testing of materials is arranged with ***appropriate persons***, if necessary. 3.3. Test results are analysed and material choices are confirmed or modified as appropriate.

Variable	Range
Standards	Where reference is made to industry codes of practice, and/or Ethiopian/international standards, it is expected the latest version will be used.
Appropriate tests	which can be undertaken by a technician within the organisation as well as those required to be undertaken by external organisations, including simple tests

Required properties	to be tested include: • tensile strength • compression • shear characteristics • torsion • hardness • impact resistance • fatigue resistance • creep resistance • visual appearance and colour • magnetic properties • corrosion resistance
Appropriate persons	Internal technicians and/or external organisations

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • describe common non metallic materials and their properties • match common non -metallic materials to engineering applications • identify and arrange tests for common non-metallic materials. • Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • principles involved in selecting non-metallic materials • compromises made to accommodate cost against properties
Underpinning Skills	Demonstrate skills to: • undertake research • select/carry out tests appropriate to the material • communicate • document • plan and sequence operations • read, interpret and follow information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. Resources required include suitable access to an operating plant or equipment that allows for appropriate

	and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Select Metal Forming Process**
Unit Code	**IND BPM5 07 0117**
Unit Descriptor	This competency covers the selection of the appropriate metal forming processes for an application. It requires using metallurgical principles and techniques to select a process which is appropriate for the required product end use and the metal(s) to be used This competency applies to technicians who are required to recommend a metal forming process for making a metal product.

Elements	Performance Criteria
1. Confirm requirements	1.1. Technical and aesthetic specification is communicated with stakeholders 1.2. Process constraints such as timelines and cost are identified 1.3. Any special requirements of product or process are identified 1.4. Product and process requirements are confirmed with stakeholders.
2. Shortlist possible forming processes	2.1. Forming processes which may be appropriate are identified. 2.2. Suitability of different processes are discussed with stakeholders. 2.3. Stakeholders are guided to determine relative benefits of individual processes 2.4. Conflicts of information and benefits that arise are clarified.
3. Select metal forming process.	3.1. The most appropriate process is selected for the application. 3.2. Reasons for selecting process are explained to stakeholders. 3.3. Any unresolved areas are clarified.

Variable	Range
Codes of practice/standards	Where reference is made to industry codes of practice, and/or Ethiopian/international standards, it is expected the latest version will be used.
Context	This competency applies to metallurgical technicians working in a foundry who may be required to make a recommendation of an appropriate forming process for a

	metal product. The appropriate process may, or may not be one conducted in a foundry.

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • select appropriate forming process • justify the selection of that process • ask appropriate questions to determine the required information. • Consistent performance should be demonstrated. In particular look to see that: • several scenarios requiring the selection of different processes have been completed successfully
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • Casting Methods including greensand, chemically-bonded sand, horizontal part, vertical part, investment, gravity die, pressure die, centrifugal, direct cast; • Powder Metallurgy including unidirectional die pressing, isotropic pressing, power rolling, power swaging, power extrusion, explosive compacting, sintering; • Electrometallurgy including chemical and mechanical pre-treatments, electroplating, cadmium plating, zinc plating, tin plating, copper plating, nickel plating, chromium plating, electro polishing; • Methods of metalworking including plastic deformation, recrystallization, recovery, grain growth, structural changes, property changes, direct compression, indirect compression, tensile, bending, shearing; • Direct compression processes including forging, rolling; • Indirect compression processes including extrusion, wire drawing, tube drawing, deep drawing • Tensile processes including stretching • Bending processes including cold and hot bending • Cutting and shearing processes including turning, milling, grinding, shearing, • Lubrication for metal forming processes including role of lubrication, types of lubricants • Metal forming risk factors including tool and die wear, metal fatigue, tool and product heating, (can we add some more?) • Furnaces including melting furnaces, heating furnaces, energy sources, atmospheres, refractoriness • Isotropic & anisotropic materials including directional and non-directional plastic and fracture properties, texture etc; • Competence also requires the ability to identify and ask questions which will lead stakeholders to describe the key factors and properties required.

	• Knowledge should also include economic and timeliness factors as well as quality, aesthetics of finish and technical differences such as strength, rigidity, corrosion resistance, grain structure, chemical composition etc.
Underpinning Skills	Demonstrate skills to: • Communicate technical information both with technical and non-technical stakeholders who may be customers or managers. • Write to the level of reading technical information and writing technical reports and production specifications. • understand and interpret numeric data
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Select and Control Inspection Processes and Procedures**
Unit Code	**IND BPM5 08 0117**
Unit Descriptor	This unit covers selecting inspection and test procedures, and controlling the inspection/test environment and equipment. The unit applies to a range of manufacturing enterprises where inspection involves working autonomously and taking responsibility for overseeing inspection process and environment. This person would use a wide range of equipment/instruments and take responsibility for the reliability of inspection results to ensure conformance to specifications.

Elements	Performance Criteria
1. Select inspection/test procedures	1.1. Appropriate methods of inspection are selected and implemented. 1.2. Inspection/test procedures are monitored to ensure desired outcomes.
2. Control inspection/test environment and equipment	2.1. Environmental conditions are monitored to ensure reliability of tests and results. 2.2. Equipment/instruments are checked for correct calibration. 2.3. Calibration of equipment/instruments is initiated or undertaken against appropriate standard as required. 2.4. Calibration records are maintained to standard operating procedure. 2.5. If equipment/instruments are found to be out of calibration, validity of previous results is checked and reported according to standard operating procedures.

Variable	Range
Personal Experian's	May include but not limited to: • Inspect equipment and analyse problem

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • the appropriate inspection method for the process/product • the effects of environmental conditions on test equipment and the results

	• codes, standards, legislative or regulatory requirements applicable to the measuring equipment and/or calibration • procedures for reporting out of calibration measuring equipment • measuring components to specified tolerances
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • a range of inspection methods and their application • procedures for implementing inspection methods • the desired/target outcomes of the inspection/test procedures • reasons for discrepancies/trends • procedures for monitoring inspection/test procedures • procedures for monitoring environmental conditions • the acceptable range of variations to environmental conditions • the correct operation of the measuring equipment • the specifications of the measuring equipment • procedures for checking the calibration of the measuring equipment • appropriate techniques, tools and equipment to measure components • units of measurement and numerical operations/calculations within the scope of this unit • procedures for initiating the calibration of measuring equipment • the physical reference standard against which the measuring equipment is to be calibrated • procedures for calibrating measuring instruments • tools and equipment required to calibrate measuring equipment • procedures for recording calibration details • the reasons for keeping calibration records • the procedures to be followed when measuring equipment is found to be out of calibration • the reasons for checking results from out of calibration measuring equipment • hazards and control measures associated with inspection, including housekeeping • use and application of personal protective equipment • safe work practices and procedures
Underpinning Skills	Demonstrate skills of: • reading, interpreting and following information on standard operating procedures and other applicable reference documents • checking and clarifying task-related information • entering and maintaining information onto preforms and standard workplace forms and records

	• checking for conformance to specifications • using measurement equipment within the scope of this unit • implementing inspection method for the product/ process • monitoring inspection/test procedures to ensure desired outcomes are achieved • monitoring environmental conditions • checking calibration of measuring equipment • initiating calibration of measuring equipment
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Perform Leveling and Alignment of Machines and Engineering Components**
Unit Code	**IND BPM5 09 0117**
Unit Descriptor	This unit covers undertaking leveling and alignment measurements/readings and performing leveling and/or alignment tasks.

Elements	Performance Criteria
1. Undertake leveling and alignment measurements/readings	1.1. Principles *of* leveling and alignment are understood and utilised. 1.2. Task requirements are determined by inspection of equipment to be leveled and/or components to be aligned. 1.3. The correct appropriate ***leveling and/or alignment procedure*** is selected. 1.4. Correct and appropriate ***leveling or alignment devices/equipment*** are selected and set up to standard operating procedures or manufacturers' recommendation. 1.5. Measurements/readings are taken accurately and recorded correctly to standard operating procedures.
2. Perform leveling and/or alignment tasks	2.1. Correct and appropriate engineering principles, techniques, tools and equipment are selected. 2.2. ***Leveling realignment calculations*** are performed using correct and appropriate method for leveling /alignment application. 2.3. Equipment is leveled to specifications using correct and appropriate techniques 2.4. Leveling and alignment task are completed to specifications.

Variable	Range
Leveling and/or alignment procedures	Face and rim, reverse indicator, use of jacking bolts and shimming material, straight edge and feeler gauge, use of leveling equipment, etc.
Leveling and alignment devices/equipment	Precision levels, spirit levels, line levels, optical levels, electronic levels, laser levels, dial indicators, special type dial indicator fixtures, magnetic bases, feeler gauges, bench centres, vee blocks, plumb line, folding wedges, straight edges, shim pack materials, dumpy levels etc.
Leveling realignment calculation	Performed using the most appropriate means for the type of application being performed

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • effects on equipment performance and life of non-level or out of alignment components • reasons for selecting tools, techniques and equipment • setting up leveling /aligning equipment
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • principles of leveling and alignment • numerical operations, geometry and calculations/formulae for leveling and alignment • techniques, tools, equipment and procedures to carry out the leveling and/or alignment • hazards and control measures associated with leveling and alignment • use and application of personal protective equipment • safe work practices and procedures
Underpinning Skills	Demonstrate skills of: • reading, interpreting and following information on standard operating procedures, manufacturer recommendations, drawings and other applicable reference documents • taking leveling and alignment measurements/readings • performing leveling /alignment calculations
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Manage People Performance**
Unit Code	**IND BPM5 10 0117**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to manage the performance of staff who report to them directly. Development of key result areas and key performance indicators and standards, coupled with regular and timely coaching and feedback, provide the basis for performance management. This unit applies to all managers and team leaders who manage people. It covers work allocation and the methods to review performance, reward excellence and provide feedback where there is a need for improvement. The unit makes the link between performance management and performance development, and reinforces both functions as a key requirement for effective managers. This is a unit that all managers/prospective managers who have responsibility for other employees should strongly consider undertaking.

Elements	Performance Criteria
1. Allocate work	1.1. Work to be allocated and resources available are consulted relevant groups and individuals 1.2. Work plans are developed in accordance with operational plans 1.3. Work is allocated in a way that is efficient, cost effective and outcome focussed 1.4. ***Performance standards***, ***Code of Conduct*** and work outputs are confirmed with relevant teams and individuals 1.5. ***Performance indicators*** are developed and agreed with relevant staff prior to commencement of work 1.6. ***Risk analysis*** is conducted in accordance with the organisational risk management plan and legal requirements
2. Assess performance	2.1. ***Performance management*** is designed and processes are reviewed to ensure consistency with organisational objectives and policies 2.2. Participants are trained in the performance management and review process 2.3. Performance management is conducted in accordance with organisational protocols and time lines

	2.4. Performance is monitored and evaluated on a continuous basis
3. Provide feedback	3.1. Informal feedback is provided to staff on a regular basis 3.2. Poor performance is advised relevant people and necessary actions are taken 3.3. On-the-job coaching is provided when necessary to improve performance and confirm ***excellence in performance*** 3.4. Performance is documented in accordance with the organisational performance management system 3.5. Formal structured feedback sessions are conducted as necessary and in accordance with organisational policy
4. Manage follow up	4.1. Performance improvement and development plans are written and agreed in accordance with organisational policies 4.2. Assistance is sought from human resources specialists where appropriate 4.3. Excellence is reinforced in performance through recognition and continuous feedback 4.4. Individuals are monitored and coached with poor performance 4.5. Support services are provided where necessary 4.6. Individuals who continue to perform below expectations are counselled and the disciplinary process is implemented if necessary 4.7. Staff is ***terminated*** in accordance with legal and organisational requirements where serious misconduct occurs or ongoing poor-performance continues

Variable	Range
Performance standards	Mean: • level of performance sought from an individual or group which may be expressed either quantitatively or qualitatively
Code of Conduct	Means: • agreed (or decreed) set of rules relating to employee behaviour/conduct with other employees or an agreed (or decreed) set of rules relating to employee behaviour/conduct with other employees or customers
Performance indicators	Mean: • measures against which performance outcomes are gauged
Risk analysis	Means: • determination of the likelihood of a negative event

	preventing the organisation meeting its objectives and the likely consequences of such an event on organisational performance
Performance management	Means: • in accordance with relevant industrial agreements • process or set of processes for establishing a shared understanding of what an individual or group is to achieve, and managing and developing individuals in a way which increases the probability it will be achieved in both the short- and long-term
Excellence in performance	Means: • regularly and consistently exceeding the performance targets established while meeting the organisation's performance standards
Termination	Means: • cessation of the contract of employment between an employer and an employee, at the initiative of the employer within relevant industrial agreements

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • documented performance indicators and a critical description and analysis of performance management system from the workplace • techniques in providing feedback and coaching for improvement in performance • knowledge of relevant awards and certified agreements.
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination • relevant awards and certified agreements • performance measurement systems utilised within the organisation • unlawful dismissal rules and due process • staff development options and information.
Underpinning Skills	Demonstrate skills in: • communication skills to articulate expected standards of performance, to provide effective feedback and to coach staff who need development • risk management skills to analyse, identify and develop mitigation strategies for identified risks • planning and organization skills to ensure a planned and objective approach to the performance management system.

Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting. Assessment must ensure: • access to appropriate documentation and resources normally used in the workplace

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Undertake Project Work**
Unit Code	**IND BPM5 11 0117**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to undertake a straightforward project or a section of a larger project. This unit addresses the management of projects, including developing a project plan, administering and monitoring the project, finalising the project, and reviewing the project to identify lessons learned for application to future projects.

Elements	Performance Criteria
1. Define project	1.1. ***Project scope and other relevant documentation*** is accessed 1.2. Project ***stakeholders*** are defined 1.3. Clarification is sought from ***delegating authority*** of issues related to project and ***project parameters*** 1.4. Limits of own responsibility and reporting requirements are identified 1.5. Relationship of project to other projects and to the organization's objectives is clarified 1.6. Available resources are determined and accessed to undertake project.
2. Develop project plan	2.1. ***Project plan*** is developed in line with the project parameters 2.2. Appropriate ***project-management tools*** are identified and accessed 2.3. Risk-management plan is formulated for project, including Work Health and Safety (WHS) 2.4. Project budget is developed and approved 2.5. Team members are consulted and their views taken into account in planning the project 2.6. Project plan is finalised and necessary approvals are gained to commence project according to documented plan
3. Administer and monitor project	3.1. Action is taken to ensure project team members are clear about their responsibilities and the project requirements 3.2. ***Support*** is provided for project team members, especially with regard to specific needs, to ensure that the quality of the expected outcomes of the project and documented time lines are met

	3.3. ***Required record-keeping systems*** are established and maintained throughout the project 3.4. Plans are implemented and monitored for managing project finances, ***resources*** and quality 3.5. Project reports are completed and forwarded as required to stakeholders 3.6. ***Risk management*** is undertaken as required to ensure project outcomes are met 3.7. Project deliverables are achieved
4. Finalise project	4.1. Financial record keeping associated with project is completed and checked for accuracy 4.2. Transition of staff involved in project to new roles or reassignment to previous roles is ensured 4.3. Project documentation is completed and ***necessary sign-offs*** are obtained for concluding project
5. Review project	5.1. Project outcomes and processes are reviewed against the project scope and plan 5.2. Team members are involved in the project review 5.3. Lessons learned from the project and report are documented within the organisation

Variable	**Range**
Project scope and other relevant documentation	May include: • contract or other agreement • project brief • project plan or summary • other documents outlining: ➢ expected outcomes of the project ➢ inclusions and exclusions from project ➢ project resources ➢ quality standards for project ➢ Timeframes for project.
Stakeholders	May include: • clients or customers (internal and external) • funding bodies • management, employees and relevant key personnel (internal and external) with special responsibilities • Project sponsor.
Delegating authority	May include: • customer or client • funding body • manager or management representative • Project sponsor.

Project parameters	May include: • project finances or budget • integration of project within organisation • legislative and quality standards • physical, human and technical resources available or required for project • procurement requirements associated with project • reporting requirements • risks associated with project, including WHS • scope of project • Time lines.
Project plan	May include: • details of how the project will be managed • roles and responsibilities • time lines • Work breakdown structure.
Project management tools	May include: • cost schedule control system • Critical Path Method • Gantt and bar charts • life cycle cost analysis • logistics support analysis • PERT charts • project management software • risk and issues logs • spreadsheets • Technical resources required for the project, for example WHS management-system tools.
Support	May include: • additional physical, human and technical resources (within allocated budget) if and as required • encouragement • feedback • learning and development • regular project team meetings • Supervision, mentoring and coaching.
Required record-keeping systems	May include systems for: • correspondence • financial data, including costs, expenditure, income generated and purchases • project outcomes • quality data, including any test results • recording of time spent on project and progress in completing project • Samples, prototypes and models.
Resources	May include: • human • physical and technical.

Risk management	May include: • changing roles and responsibilities in project team • negotiating an extension of deadline, or redefining completion or quantity or quality of outcomes • outsourcing some aspects of the project • reducing costs • researching and applying more efficient methods for completing project tasks • seeking further resources to meet deadline • Sharing ideas to gain improvements to work undertaken in the project.
Necessary sign-offs	May include: • clients • funding body • management • Project sponsor.

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • developing a project plan • examples of monitoring arrangements and evaluation of the efficacy of the project plan in addressing project time lines and budget • Knowledge of relevant legislation.
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • organisation's mission, goals, objectives and operations and how the project relates to them • organisational structure, and lines of authority and communication in the organisation • relevant legislation and codes from all levels of government that may affect aspects of business operations, including: ➢ anti-discrimination legislation ➢ codes of practice ➢ environmental issues ➢ ethical principles ➢ WHS ➢ Privacy laws.
Underpinning Skills	Demonstrate skills of: • communication and negotiation skills to work with team members and other stakeholders to maintain project schedules • communication skills to relate to people with diverse abilities and from diverse backgrounds in a culturally appropriate way • literacy skills to read, write and review a range of documentation • numeracy skills to: ➢ analyse data

	➢ compare time lines and promotional costs against budgets • Planning and organising skills to develop, monitor and maintain implementation schedules.
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Ensure Team Effectiveness**
Unit Code	**IND BPM5 12 0117**
Unit Descriptor	This unit describes the performance outcomes, skills and knowledge required to facilitate all aspects of teamwork within the organisation. It involves taking a leadership role in the development of team plans, leading and facilitating teamwork and actively engaging with the management of the organisation This unit applies to managers and addresses the need for managers to facilitate work teams and to build a positive culture within work teams. The unit takes a systematic and planned approach to developing teams. It includes the soft skills as well as more structured approaches to the management of teams. At this level, work will normally be carried out within complex and diverse methods and procedures which require the exercise of considerable discretion and judgement, using a range of problem solving and decision making strategies.

Elements	Performance Criteria
1. Establish team performance plan	1.1. Team members are ***consulted*** to establish a common understanding of team purpose, roles, responsibilities and ***accountabilities*** in accordance with organisational goals, plans and objectives 1.2. ***Performance plans*** are developed to establish expected ***outcomes***, ***outputs***, ***key performance indicators*** and goals for work team 1.3. Team members are ***supported*** in meeting expected performance outcomes
2. Develop and facilitate team cohesion	2.1. ***Strategies*** are developed to ensure team members have input into planning, decision making and operational aspects of work team 2.2. ***Policies and procedures*** are developed to ensure team members take responsibility for own work and assist others to undertake required roles and responsibilities 2.3. Feedback is provided to team members to encourage, value and reward individual and team efforts and contributions 2.4. ***Processes*** are developed to ensure that issues, concerns and problems are identified, recognised and addressed by team members

3. Facilitate teamwork	3.1. Team members and individuals are encouraged to participate in and to take responsibility for team activities, including communication processes 3.2. The team is supported in identifying and resolving work performance problems 3.3. Ensure own contribution to work team has served as a role model for others and enhanced the organisation's image for all ***stakeholders***
4. Liaise with stakeholders	4.1. Open communication processes are established and maintained with all stakeholders 4.2. Information is communicated from ***line manager/management*** to the team 4.3. Unresolved issues, concerns and problems raised by team members are communicated and followed-up with line manager/management and other relevant stakeholders 4.4. Necessary corrective action regarding unresolved issues, concerns and problems raised by internal or external stakeholders is evaluated and taken

Variable	Range
Consultation	May refer to: • conducting meetings, interviews, brainstorming sessions, email/intranet communications, newsletters or other processes and devices which ensure that all employees have the opportunity to contribute to team and individual performance plans • mechanisms used to provide feedback to the work team in relation to outcomes of consultation
Accountabilities	May refer to: • responsibilities as defined in position descriptions, codes of conduct/behaviour, duty statements or similar • statement of conduct outlining responsibilities/actions/performance
Performance plans	May refer to: • individual performance plans linked to team goals • team plans based on work assignments and responsibilities
Outcomes, outputs, key performance indicators	Agreed may refer to: • changes in work roles and responsibilities • improved individual and team, performance and participation • improvements to systems, operations • measures for monitoring and evaluating the efficiency or effectiveness of systems or services • quality standards and expectations

	• targets for productivity improvements such as reduced downtime, higher production levels, decreases in absenteeism • targets for training and development
Supporting	May include: • Coaching • Mentoring • Training and development opportunities • Clarification of roles and expectations • Long term or short term plans • Meetings
Strategies	May refer to: • clarification of roles and expectations • electronic communication devices and processes, such as intranet and email communication systems, to facilitate input • long-term or short-term plans factoring in opportunities for team input • mentoring and 'buddy' systems to support team members in providing input • newsletters and briefings • training and development activities
Policies and procedures	May refer to: • organisational guidelines and systems that govern operational functions • procedures that detail the activities that must be carried out for the completion of actions and tasks • Standard Operating Procedures
Processes	May refer to: • brainstorming options with the team for addressing concerns • creating a matrix of issues and concerns and distributing for comment • discussions with individuals regarding their concerns • distributing drafts for comment with a range of options for resolution of concerns • training and development sessions
Stakeholders	May include: • Board members • business or government contacts • funding bodies • union/employee groups and representatives • work team
Line manager/management	May refer to: • chief executive officer • direct superior • other management representatives

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • range of techniques that can be used to build work teams, strengthen communications in the team and resolve issues • methods for engaging with stakeholders and obtaining advice from outside the work team, to ensure team is focussed and on track • Knowledge of group behaviour.
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • group behaviour • strategies for mentoring and coaching to informally guide and instruct team members • issue resolution • strategies for gaining consensus
Underpinning Skills	Demonstrate skills of: • communication skills to explain team goals, to address team conflict and to build an environment of trust • planning and organisational skills to keep team on track and focussed on work outcomes.
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / written test • Observation / demonstration with oral questioning • Analysis of responses to case studies and scenarios • Assessment of written reports • Demonstration of team building techniques • Direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate • Observation of performance in role plays • Review of performance plans developed for work team • Review of policies and procedures developed to ensure team members take responsibility for own work
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting. Assessment must ensure: • Access to appropriate documentation and resources normally used in the workplace.

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Manage Complex Projects**
Unit Code	**IND BPM5 13 0117**
Unit Descriptor	This unit covers management of projects that may be reasonably complex in terms of scope, degree of risk, political, cultural and social factors that apply, consequences of failure and degree of control of the projects. It includes managing start-up, project implementation, project integration and follow-up activities. Contract management requirements are not included as this aspect is addressed by units of competency within the Competency field of Procurement and Contract Management. In practice, managing complex projects overlaps with other generalist and specialist work activities such as acting ethically, coordinating resource allocation and usage, developing client services, undertaking research and analysis.

Elements	Performance Criteria
1. Manage start-up activities	1.1. ***Project plans*** are refined in consultation with steering committee and team members, and precise details are included for schedules of activities, milestones and resources. 1.2. ***Required systems*** are established and maintained throughout the project in accordance with the complexity of the project and in line with the project plan. 1.3. Project team members' understanding of and commitment to fulfilling the project requirements and their roles and responsibilities for the duration of the project are confirmed. 1.4. ***Project management tools*** are selected and applied effectively to achieve project outcomes.
2. Manage project implementation	2.1. ***Integration*** and ***management*** of complex project activities are handled in accordance with the project plan. 2.2. Leadership and required ***development*** are provided to the project team, and morale, stress levels and triggers are managed throughout the life of the project in accordance with organisational ***policy and procedures***. 2.3. ***Stakeholders'*** input and expectations are managed throughout the project in accordance with the communication plan.

	2.4. Disagreements and disputes are resolved to the satisfaction of stakeholders or referred to a higher authority in accordance with organisational policy and procedures. 2.5. Project ***change proposals*** are negotiated, agreed and documented in accordance with policy and procedures.
3. Manage project integration	3.1. All aspects of the project and related projects are integrated and links are established to ensure objectives are met in accordance with the project plan. 3.2. Consultation and reporting mechanisms are applied in accordance with the communication plan and staff and contractors are regularly consulted to discuss progress and ensure effective results. 3.3. Project integration is monitored, and management plans and any related contracts are reviewed and amended as appropriate, with results reported in accordance with mechanisms identified in the communication plan. 3.4. Ongoing progress is monitored against agreed milestones in accordance with the project plan to provide a measure of performance throughout the life of the project. 3.5. Programmed review of objectives and achievement is planned and implemented in accordance with the project plan.
4. Coordinate project follow-up activities	4.1. Significant judgment is applied in the analysis of project deliverables against ***specifications***, performance standards and project objectives, and the results are reported to stakeholders. 4.2. Support package arrangements are identified and offered to stakeholders who will be required to apply the project results. 4.3. Options for stakeholders to take account of environmental and cultural factors in applying the project results are included in the support package. 4.4. Operational and support authorities are consulted to investigate any testing/trialling/building and evaluation requirements resulting from the project, and funding implications estimated in project report.

Variable	**Range**
Project plans	May include: • acquisition strategies

	• budget and financial management strategy • contract management • cost estimates • evaluation criteria • expected outcomes/measurable benefits of the project • facilities • inclusions and exclusions from project • information/communication strategy • intellectual property strategies • milestones • objectives • outputs/project deliverables and their acceptance criteria • people plan including human resource management and human resource development • performance criteria/indicators • project control mechanisms • project implementation strategy • project governance strategy • purpose • quality assurance • quality control • quality standards for project • rationale • required project resources • resource management • risk management • roles and responsibilities • schedule/timeline • task/Work Breakdown Structure (WBS)
Required systems	May include: • planning and monitoring system • financial management including: • budget allocation/funding • income generated • expenditure • recordkeeping for documented information such as: • correspondence • quality data including survey, needs, test results • contracts • time allocated and spent on each aspect of the project • progress reports • performance reports against milestones • project outcomes • samples, prototypes, models
Project management tools	May include: • risk analysis

	• organisational project governance framework • communications plan • reporting framework • project management software and other tools: • Gantt and bar charts • Program Evaluation and Review Technique (PERT) charts • Critical Path Method • cost schedule control system • logistics support analysis • life cycle cost analysis • spreadsheets • recording systems - electronic and manual
Integration	May include: • time • scope • cost • quality • human resources • communications • risk • procurement
Management	May include: • scope management • communication and reporting • schedule management • financial management • fraud control • quality management • resources management • people management • logistics management • risk management • contract management • project implementation • transition • change management
Development	May include: • regular meetings • feedback • encouragement • mentoring and coaching • additional physical and human resources (within allocated budget) if and as required
Policy and procedures	May include: • government legislation (Federal, State and Local) affecting organisation's administration such as:

	➢ public sector management acts ➢ financial management and accounting legislation and regulations ➢ privacy legislation • government and organisational guidelines and procedures relating to: ➢ project governance ➢ resourcing ➢ security ➢ strategic plans ➢ recruitment ➢ risk management ➢ procurement guidelines ➢ designation approvals ➢ industrial agreements ➢ environment and sustainability
Stakeholders'	May include: • project sponsor/funding bodies • clients or customers (internal and external) • industry • other agencies • general public • relevant interest groups • unions • functional areas • the organisation's senior management • Ministers • project team • steering committee • end user • supplier/service provider
Change proposals	May include: • administration • cost • engineering, technical, technology changes • resources • scope • specifications • time
Specifications	May Include: • functional • technical • performance and material

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • the knowledge requirements of this unit • the skill requirements of this unit

	• application of the Employability Skills as they relate to this unit (see Employability Summaries in Qualifications Framework) • management of complex projects in a range of (3 or more) contexts (or occasions, over time)
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • legislation, organisational policies and procedures that may impact on project implementation, for example: • public sector codes of ethics/conduct • occupational health and safety and environmental and sustainability requirements • project governance requirements • quality standards • risk management • procurement guidelines • financial management and budgetary framework • human resources • equal employment opportunity, equity and diversity principles • project management tools to suit a range of reasonably complex projects in terms of scope, degree of risk, political, cultural and social factors that apply, consequences of failure and degree of control of the project • project management systems • organisational and political context • critical analysis in a project management context • business and commercial issues related to the projects managed
Underpinning Skills	Demonstrate skills of: • mentoring people to achieve project outcomes • maintaining agreement of stakeholders and team members to timelines, roles and responsibilities • negotiating with stakeholders and team members using communication styles to suit different audiences and purposes • responding to diversity, including gender and disability • using project management tools applicable to reasonably complex projects • applying ethical decision making and problem solving related to project management of reasonably complex projects • writing recommendations and preparing project reports requiring precision of expression • applying workplace safety procedures in line with project requirements • accessing/preparing information electronically or in hard copy

Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices and may include: • legislation, guidelines, procedures and protocols relating to project management in the organisation and the public sector • workplace project documentation • scenarios and case studies examples of project management tools
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning • people with disabilities • people from culturally and linguistically diverse backgrounds • Aboriginal and Torres Strait Islander people • women • young people • older people • people in rural and remote locations Assessment methods suitable for valid and reliable assessment of this competency may include, but are not limited to, a combination of 2 or more of: • case studies • demonstration • portfolios • questioning • scenarios • authenticated evidence from the workplace and/or training courses
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting. • a workplace environment or one that closely resembles normal work practice and replicates the range of conditions likely to be encountered when managing complete projects, including coping with difficulties, irregularities and breakdowns in routine • management of complex projects in a range of (3 or more) contexts (or occasions, over time

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Prepare Technical Reports**
Unit Code	**IND BPM5 14 0117**
Unit Descriptor	This unit covers the competence to identify and analyse requirements, to plan and conduct research, to evaluate information and findings, and to develop, document and present technical reports. A technical report is one that researches, analyses and reports on the specifications and/or effectiveness of existing or proposed technical systems, common entry, materials and/or processes.

Elements	Performance Criteria
1. Prepare for the reporting requirement	1.1. Purpose or objective of the report is identified, clearly defined and confirmed with the customer or sponsor. 1.2. Project timeframe and outline plan of the main activities are prepared and confirmed with key parties. 1.3. Requirements for information entry, storage, output and quality of document production are identified in accordance with enterprise procedures.
2. Plan the research effort	2.1. Scope and nature of the information requirements are identified. 2.2. All possible sources of the required information are researched and identified. 2.3. A systematic research or information collection plan is designed to optimise the process. 2.4. Resources are obtained and scheduled to service the research requirements. 2.5. Workplace procedures relating to reporting and communication are followed.
3. Conduct research	3.1. Research is undertaken effectively in accordance with the plan. 3.2. Experiments and tests to support the research effort are conducted in a manner which ensures the demonstrable integrity of the outcomes or findings. 3.3. Research findings are logged, documented and stored to maintain traceability. 3.4. Preliminary analysis is conducted to identify requirements for variations or additions to the research plan.

4. Analyse the information	4.1. Information is sorted, documented and prepared for the analytical process. 4.2. Information and data is manipulated to enable reasonable comparisons and judgements. 4.3. Clarification by way of expert advice and opinion are sought. 4.4. Conclusions and findings reached are made logical and based on objective analysis of the available data.
5. Prepare and present the report	5.1. The objectives, process, findings and further actions are defined. 5.2. The stated objective and timeframe are addressed and satisfied. 5.3. Presentation materials of a standard and quality is associated for the intended audience. 5.4. Reader comprehension of the report is aided by use of executive summaries and attachments. 5.5. Protocols, conventions and legal requirements related to acknowledgements and intellectual property are applied. 5.6. Information management requirements, including documenting and repository actions are satisfied in accordance with enterprise procedures.

Variable	**Range**
Workplace environment	• Work may involve individual and team related activities. • Work may be carried out in a commercial, workshop, laboratory or research establishment.
Personal protective equipment	• Personal protective equipment is to include that prescribed under legislation, regulations and enterprise policies and practices.
Information and procedures	• Workplace procedures relating to reporting and communication. • Vehicle industry publications related to emerging system technology and technology changes. • Professional publications. • Train research collections and access facilities. • Manufacturer/component supplier specifications and application procedures for testing equipment and materials. • Manufacturer/component supplier specifications, schematics and operational procedures related to systems.

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • Locate, interpret and apply information. • Apply safety requirements throughout the work sequence, including the use of personal protective clothing and equipment. • Identify and itemise steps and stages covering confirmation of objective, research planning and conduct and report preparation. • Complete a significant technical report covering: • detailed research of the topic area • a full analysis of the research outcomes • conclusions and recommendations clearly supported by the facts • Satisfaction of legal, regulatory or intellectual property law requirements. • Modify activities to cater for variations in research findings. • Work effectively with others.
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • Technical writing and presentation techniques. • Enterprise (or equivalent) technical procedure formats, content rules, preparation and management techniques.
Underpinning Skills	Demonstrate skills to: • Research, collect, organise and understand technical information related to the subject area, developmental activities, testing processes, diagnostic methods and options and safety procedures. • Communicate ideas and information to ensure the completeness, clarity and comprehension of the technical report by the target audience. • Plan and organise the research and writing effort to avoid backtracking, workflow interruptions or wastage. • Work with others and in a team by recognising dependencies and using cooperative approaches to optimise research and writing. • Use mathematical ideas and techniques to incorporate calculation, measurements, calibration and test requirements into research and validation activities. • Establish processes which anticipate and allow for risks, cater for both direct and indirect causes, avoid or minimise reworking and avoid wastage in the research and report preparation activities. • use the workplace technology related to document preparation, including computing systems and information management systems, calculators and measuring devices

Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting. Assessment may occur on the job or in a workplace simulated activity. Access to a significant technical research and reporting requirement, information sources and a working environment

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Optimize Production Systems**
Unit Code	**IND BPM5 15 0117**
Unit Descriptor	This unit covers the application of in depth knowledge of process and plant to the optimisation of complex operating production systems. In a typical scenario, a senior technician reviews the operation of a complex production system or whole production plant, with a view to improving the efficiency of operation of the process to improve the yield, utilization of services or production of waste. The operation will be thoroughly reviewed by gathering data on usage patterns, production rates, operational practices and conditions with a view to determining areas of improvements or possible gains in efficiency or reductions in variability. Optimization is often a multi-pass process whereby the process is modified, reviewed and modified again as required. The stimulus for optimization is usually not in response to a problem, but a desire to improve the performance of an operating process. The corrective action may well be beyond the scope of competency and responsibility of the senior technician to implement. Typical systems optimisations may include: • utilisation of services across a production facility • variability of product properties produced from a multi-line batch reaction process • variability of plant performance from shift to shift, day to day, week to week • The senior technician would: • gather historical plant operating or product quality data • review the data for trends or dependencies • investigate cause and effect responses • Recommend a solution to the problem. Generally the technician would work alone for this unit, although the ability to communicate with all internal and external stakeholders is vital.

Elements	Performance Criteria
1. Identify process or system for review.	1.1. Process or plant performance is reviewed to determine likely areas of improvement. 1.2. Data on the process or system design is gathered. 1.3. The data collection system is designed for the required data. 1.4. Ethiopian/international ***standards***, the latest version must be used.

2. Collect and analyse data.	2.1. Available data is collected or reviewed from the process or plant 2.2. The data is analysed for trends or dependencies 2.3. Possible cause and effect scenarios are postulated
3. Develop tests or trials.	3.1. Controlled tests or trials are proposed to review the plant or process patterns 3.2. Possible solutions are discussed to cause with relevant people 3.3. Required tests or controls to be undertaken are arranged inappropriate time frame 3.4. Further data is collected from tests or trials 3.5. Plant or process data is reviewed and compared with original data. 3.6. Further tests or trials are prepared as required, or until possible solutions are developed.
4. Develop improvement solution	4.1. Required improvement solution is agreed with appropriate people 4.2. Required improvement solution to be undertaken is arranged in appropriate time frame 4.3. Items initiated are followed through until final resolution has occurred 4.4. Effectiveness of solution is checked and appropriate action taken 4.5. Reports are completed to procedure.

Variable	**Range**
Standards	Where reference is made to industry codes of practice, and/or Ethiopian/international standards, the latest version must be used.
Context	This unit of competency includes reviews of the plant, plant equipment or process which may make itself evident through desire for improved quality, higher yields, less waste or better control.
Health, Safety and Environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • different types of processes or plant units can be analysed and resolved

	• different types of stakeholders can be satisfied • the range of possible causes can be identified and analysed and the most likely cause determined • Appropriate action is taken. • These aspects may be best assessed using a range of scenarios/case studies/what-ifs. These assessment activities should include a range of optimisation projects which may have been generated from the past history and similar sources.
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • plant equipment, its characteristics and limitations • impact of variations in plant/process and the distinctive signs of each variation • process chemistry, physics and biochemistry as relevant (e.g. to the extent of writing chemical equations and identifying factors controlling reaction rate and yield or equivalent, or determining mass or heat transfer rates for a process) • problem isolation techniques • problem analysis techniques • organisation approval processes
Underpinning Skills	Demonstrate skills of: • data collection and analysis • problem solving for multi-variable processes • negotiation • communication • basic mathematics
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning • In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting. Assessment will require a suitable method of gathering evidence of problem solving ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Investigate Consumer Complaints**
Unit Code	**IND BPM5 16 0117**
Unit Descriptor	The unit covers the competency required to investigate consumer complaints in relation to measurement.

Elements	Performance Criteria
1. Receive and document the complaint	1.1. Allegations are recorded in accordance with ***organizational procedures***. 1.2. ***Complaints*** are screened to ensure that they are relevant to trade measurement and are assessed to determine priority. 1.3. Complainant is advised of investigative process and timeframes for feedback.
2. Plan the investigation	2.1. The information received is assessed for possible breaches in relation to the ***legislation***. 2.2. Trader history and complaint precedence is researched. 2.3. Suitable ***equipment*** and personnel are organised to undertake the investigation. 2.4. Enforcement policies and procedures are researched to ascertain appropriate action to be implemented.
3. Investigate the complaint	3.1. Preliminary investigation to gather prima facie evidence is conducted in accordance with organisational procedures. 3.2. Evidence is gathered to substantiate a breach accordance with investigative practices. 3.3. The relevant components of a routine field inspection are conducted in accordance with organisational procedures.
4. Finalise the complaint investigation	4.1. ***Information*** relevant to the inspection is communicated to the trader. 4.2. Approved procedures to remedy non-compliance are determined and applied. 4.3. Inspection documentation is completed in accordance with organisational procedures.
5. Complete complaint file documentation	5.1 Complainant is advised of outcome of the investigation. 5.2 Complaint ***documentation*** is completed in accordance with organisational guidelines.

Variable	Range
Organisational procedures	Trial purchase, surveillance, witness statements, verification/in-service inspection procedures, pre-packed articles inspection procedures, trading practices inspection procedures, routine field inspection procedures
Complaints	Measuring instruments, pre-packed articles, trading practices, servicing licensees, public weighbridge licensees, fair trading matters relating to trade measurement
Legislation	Enabling legislation, workplace, health and safety, environmental legislation, enforcement policies
Equipment	Reference standards, test equipment, safety equipment
Sources of information	Business/company details, organisational database, searches from other government agencies
Documentation	Organisational forms, notices, field books, product handling sheets, educational material/brochures

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • organisational policy guidelines concerning complaints • the organisation's guidelines for the deployment of personnel • establishing appropriate courses of action • accurately recording results of the investigation in the complaint file • using appropriate investigative techniques are used
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • the different methods of complaint lodgements • organisational guidelines in regard to timelines • the equipment required to investigate a range of complaints • the range of possible investigation activities available • elements of offence • available surveillance methods for a range of complaints and premises
Underpinning Skills	Demonstrate skills of: • accurately recording complaint details • prioritising complaints and other related activities • researching and applying relevant legislation to the complaint investigation • accessing and using organisational information systems • identifying and organising suitable equipment and personnel • briefing personnel concerning the requirements of the investigation • accessing the organisation's enforcement policies and procedures • conducting surveillance of trading premises is conducted • gathering information to verify the complainant's

	allegations • gathering evidence to prove all elements of a breach • maintaining the integrity of evidence • responding to traders' concerns • Discussing traders' enquiries and concerns. • explaining legislative requirements and obligations to the trader • completing notices in accordance with organisational guidelines • planning follow-up activities • recording results of the inspection accurately in organisation's information files • completing breach reports in accordance with organisational guidelines • communicating outcomes of the investigation to the complainant within specified organisational timeframes • applying interpersonal communication and listening skills
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Contribute to the Development of Products or Processes**
Unit Code	**IND BPM5 17 0117**
Unit Descriptor	This unit covers the skills and knowledge required to contribute to developing products or processes within the workplace.

Elements	Performance Criteria
1. Interpret provisional specifications	1.1. Provisional specifications are identified 1.2. Specifications are interpreted, in consultation with others, where required.
2. Participate in feasibility studies	2.1. ***Requirements*** for feasibility study are identified, in conjunction with others, as required 2.2. Assistance is provided in studies to assess feasibility of design and development through sampling, trial run production, consideration of machine or equipment capabilities, availability of resources, required quality and cost
3. Assist in developing or engineering product	3.1. Product or process specifications are interpreted and preliminary specifications are developed from ***feasibility study*** 3.2. Specifications are used to develop or engineer the product 3.3. Raw materials are checked or selected to meet requirements 3.4. Machine or equipment or skill availability are determined against requirements 3.5. Other ***OHS practices*** relevant to the job and enterprise are applied
4. Conduct trials	4.1. Requirements for ***trials*** are confirmed and clarified, where necessary, to establish procedures and parameters 4.2. Organisation and liaison with production area occurs, where required 4.3. Trials are assessed in accordance with the established procedures
5. Analyze and interpret results	5.1 Results of the trials are analysed to determine performance and acceptability for production 5.2 Analysis is interpreted to determine performance and acceptability for production
6. Report results and maintain records	6.1 Reports are prepared 6.2 Records are maintained, where required

Variable	Range
Requirements	• All work must comply with relevant Federal and State or Territory legislative or regulatory requirements
Feasibility studies	May include: • sampling • trial run produ0ction • consideration of machine capabilities • availability of resources • required quality • cost
OHS practices	must include hazard identification and control, risk assessment and implementation of risk reduction measures specific to the tasks described by this unit, and may include: • manual handling techniques • standard operating procedures • personal protective equipment • safe materials handling • taking of rest breaks • ergonomic arrangement of workplaces • following marked walkways • safe storage of equipment • housekeeping • reporting accidents and incidents • other OHS practices relevant to the job and enterprise
Trials	May relate: • confirmation and clarification of requirements • liaison with production area • allocating work • reviewing and evaluating processes and products • performing trials • interpreting data • analyzing results

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • conduct feasibility studies • interpret and develop specifications • use specifications appropriately • organise and conduct trials • assess results
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • industry and product processes • product and process development procedures • machine or equipment, resource and skill capabilities within the workplace • feasibility study procedures

	• safety and environmental aspects of relevant workplace activities • reporting processes • OHS practices, including hazard identification and control measures • quality practices • workplace practices • recording and reporting practices
Underpinning Skills	Demonstrate skills of: • carry out sampling • check and select raw materials • interpret specifications • establish availability of machines • determine availability of required skills and personnel • select, interpret and evaluate procedures or processes • read, interpret and follow information on work specifications, standard operating procedures and work instructions and other reference material • maintain accurate records • communicate within the workplace • sequence operations • meet specifications • clarify and check task-related information • carry out work according to OHS practices
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Manage Project Quality**
Unit Code	**IND BPM5 18 0117**
Unit Descriptor	This unit specifies the outcomes required to manage quality within projects. It covers determining quality requirements, implementing quality assurance processes, and using review and evaluation to make quality improvements in current and future projects.

Elements	Performance Criteria
1. Determine quality requirements	1.1 ***Quality objectives***, standards and levels are determined, with input from stakeholders and guidance of a higher project authority, to establish the basis for quality outcomes and a ***quality management plan***. 1.2 Established ***quality management methods, techniques and tools*** are selected and used to determine preferred mix of quality, capability, cost and time. 1.3 Quality criteria are identified, agreed with a higher project authority and communicated to stakeholders to ensure clarity of understanding and achievement of quality and overall project objectives. 1.4 Agreed quality requirements are included in the project plan and implemented as basis for performance measurement.
2. Implement quality assurance	2.1 Results of project activities and product performance are measured and documented throughout the project life cycle to determine compliance with agreed quality standards. 2.2 Causes of unsatisfactory results are identified, in consultation with the client, and appropriate actions are recommended to a higher project authority to enable continuous improvement in quality outcomes. 2.3 Inspections of quality processes and ***quality control*** results are conducted to determine compliance of quality standards to overall quality objectives. 2.4 A quality management system is maintained to enable effective recording and communication of quality issues and outcomes to a higher project authority and stakeholders.
3. Implement project quality improvements	3.1 Processes are reviewed and agreed changes implemented continually throughout the project life cycle to ensure continuous improvement to quality. 3.2 Project outcomes are reviewed against performance criteria to determine the effectiveness of quality management processes and procedures.

	3.3 Lessons learned and recommended ***improvements*** are identified, documented and passed to a higher project authority for application in future projects.

Variable	**Range**
Quality objectives	May include but not limited to: • requirements from the client and other stakeholders • requirements from a higher project authority • negotiated trade-offs between cost, schedule and performance • those quality aspects which may impact on customer satisfaction
Quality management plan	May include but not limited to: • established processes • authorizations and responsibilities for quality control • quality assurance and continuous improvement
Quality management methods, techniques and tools	May include but not limited to: • brainstorming • benchmarking • charting processes • ranking candidates • defining control • undertaking benefit/cost analysis • processes that limit and/or indicate variation • control charts • flowcharts • histograms • pareto charts • scatter gram and run charts
Quality control	May include but not limited to: • monitoring conformance with specifications • recommending ways to eliminate causes of unsatisfactory • performance of products or processes • monitoring of regular inspections by internal or external agents
Improvements	May include but not limited to: • formal practices, such as total quality management or continuous improvement • improvement by less formal processes which enhance both the product quality and processes of the project, for example client surveys to determine client satisfaction with project team performance

Evidence Guide	
Critical Aspects of Competence	Demonstrates skills and knowledge in: • lists of quality objectives, standards, levels and measurement criteria

	• records of inspections, recommended rectification actions and quality outcomes • management of quality management system and quality management plans • application of quality control, quality assurance and continuous improvement processes • records of quality reviews • lists of lessons learned and recommended improvements • how quality requirements and outcomes were determined for projects • how quality tools were selected for use in projects • how team members were managed throughout projects with respect to quality within the project • how quality was managed throughout projects • how problems and issues with respect to quality and arising during projects were identified and addressed • how projects were reviewed with respect to quality management • how improvements to quality management of projects have been acted upon
Underpinning Knowledge and Attitudes	Demonstrates knowledge of: • the principles of project quality management and their application • acceptance of responsibilities for project quality management • use of quality management systems and standards • the place of quality management in the context of the project life cycle • appropriate project quality management methodologies; and their capabilities, limitations, applicability and contribution to project outcomes • attributes: ➢ analytical ➢ attention to detail ➢ able to maintain an overview ➢ communicative and positive leadership
Underpinning Skills	Demonstrate skills of: • ability to relate to people from a range of social, cultural and ethnic backgrounds, and physical and mental abilities • project and quality management • planning and organizing • communication and negotiation • problem-solving • leadership and personnel management • monitoring and review skills
Resources Implication	Access is required to real or appropriately simulated

	situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Facilitate and Capitalize on Change and Innovation**
Unit Code	**IND BPM5 19 0117**
Unit Descriptor	This unit specifies the outcomes required to plan and manage the introduction and facilitation of change; particular emphasis is on the development of creative and flexible approaches, and on managing emerging opportunities and challenges.

Elements	Performance Criteria
1. Participate in planning the introduction and facilitation of change	1.1 Concept, nature importance and objective of change are understood. 1.2 Steps tools and approaches of changes are planned and made in consultation with ***appropriate stakeholders***. 1.3 The relationship among innovation, quality, change and cost is understood. 1.4 Environments that facilitate the expedition of change are understood. 1.5 ***Change resistance reducing techniques*** are identified and implemented.
2. Manage growth and transition of business	2.1 ***Needs for growth*** are identified. 2.2 ***Growth strategies*** are identified. 2.3 Selected growth strategies are implemented.
3 Develop creative and flexible approaches and solutions	3.1 Concepts, types and nature of problem are understood. 3.2 Variety of problem solving techniques and approaches are identified and analyzed to manage workplace issues. 3.3 ***Risks*** are identified and assessed, and action initiated to manage these to achieve a recognized benefit or advantage to the organization. 3.4 Workplace is managed in a way which promotes the development of innovative approaches and outcomes. 3.5 Creative and responsive approaches to resource management are used to improve productivity and services, and/or reduce costs.
4 Manage emerging challenges and opportunities	4.1 Future challenges and opportunities are identified in reference to global business situation 4.2 The role of technology and its value additions are explained. 4.3 Technology and innovation based system is introduced and implemented

	4.4 Individuals and teams are supported to respond effectively and efficiently to changes in the organization's goals, plans and priorities. 4.5 Coaching and mentoring are made to assist individuals and teams to develop competencies to handle change efficiently and effectively. 4.6 Opportunities are identified and taken as appropriate to make adjustments and respond to the changing needs of customers and the organization. 4.7 ***Information needs*** of individuals and teams are anticipated and facilitated as part of change implementation and management. 4.8 Recommendations are identified, evaluated and negotiated for improving the methods to manage change with appropriate individuals and groups.

Variables	**Range**
Appropriate stakeholders	May include but not limited to: • Organization directors and other relevant managers • Teams and individual employees who are both directly and indirectly involved in the proposed change • Union/employee representatives or groups • OHS committees • Other people with specialist responsibilities • External stakeholders where appropriate - such as clients, suppliers, industry associations, regulatory and licensing agencies
Change resistance reducing techniques	May include but not limited to: • Education and communication • Participation and involvement • Facilitation and support • Negotiation and agreement • Manipulation and cooptation • Explicit and implicit coercion
Needs for growth	May include but not limited to: • Survival • Economies of scale • Expansion of market • Owners mandate • Technology • Government policy and Self sufficiency
Growth Strategies	May include but not limited to: • Franchising • Outsourcing • Sub-contracting and Merging
Risks	May include financial and non-financial risks
Information needs	May include but not limited to:

	• New and emerging workplace issues • Implications for current work roles and practices including training and development • Changes relative to workplace legislation, such as OHS, workplace data such as productivity, inputs/outputs and future projections • Planning documents • Reports • Market trend data • Scenario plans and customer/competitor data

Evidence Guide	
Critical Aspects of Competence	Demonstrates skills and knowledge to: • Participate in planning the introduction and facilitation of change • Manage growth and transition of business • Develop creative and flexible approaches and solutions • Manage emerging challenges and opportunities
Underpinning Knowledge and Attitudes	Demonstrate knowledge of: • Relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination • Growth strategies • The principles and techniques involved in: ➢ Change and innovation management ➢ Development of strategies and procedures to implement and facilitate change and innovation • Use of risk management strategies: ➢ Identifying hazards, ➢ Assessing risks and implementing risk control measures ➢ Problem identification and resolution ➢ Leadership and mentoring techniques ➢ Management of quality customer service delivery ➢ Consultation and communication techniques ➢ Record keeping and management methods ➢ The sources of change and how they impact ➢ Factors which lead/cause resistance to change ➢ Approaches to managing workplace issues
Underpinning Skills	Demonstrate skills on: • Communication, Planning, Managing and team works
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test

	• Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Bogie and Body Production and Assembly Management Level V	
Unit Title	**Manage Continuous Improvement Process (Kaizen)**
Unit Code	**IND BPM5 20 0117**
Unit Descriptor	This unit describes the performance, outcomes, knowledge, attitude and skills required to sustain and develop an environment in which continuous improvement, innovation and learning are promoted, rewarded and managed.

Elements	Performance Criteria
1. Diagnose the current status.	1.1 ***Parameters*** used for study current situation are obtained. 1.2 Internal and external environment is analyzed. 1.3 Problems related to targeted environment is recognized and identified. 1.4 Problems regarding to current situation are analyzed. 1.5 Alternatives are generated. 1.6 Best alternatives are selected.
2. Design an effective continuous improvement process (kaizen).	2.1 The values, mission and goals of kaizen management system are clarified. 2.2 The ***kaizen management template*** and a visual management logo full of purpose and meaning are developed. 2.3 A clear action strategy (master and detailed plans) is defined. 2.4 The most effective and proven ***kaizen tools*** are chosen and applied. 2.5 A practical way is identified to involve all employees in ***Gemba activities*** (top, middle and bottom).
3. Develop change capability.	3. 1. Kaizen Promotion Team Structure is developed. 3. 2. The Kaizen Training Plan is defined and started. 3. 3. Supervisors' kaizen capability and habits are developed. 3. 4. Key people are developed in terms of ***Individual leadership capability***.
4. Implement improved processes.	4.1 ***Sustainability/continuous improvement*** are promoted as an essential part of doing business. 4.2 Impacts of change and consequences are addressed for people, and transition plans implemented. 4.3 Objectives, time frames, measures and communication plans are ensured in place to manage implementation.

	4.4 Contingency plans are implemented in the event of non-performance. 4.5 Failure is followed-up by prompt investigation and analysis of causes. 4.6 Emerging challenges and opportunities are managed effectively. 4.7 Continuous improvement systems and processes are evaluated regularly. 4.8 Improvements are communicated to all relevant groups and individuals. 4.9 Opportunities are explored for further development of value stream improvement processes.
5. Establish direction and control.	5.1 A ***system audit tool*** is defined and implemented. 5.2 The kaizen management system is deployed across all company levels and functions. 5.3 Results are checked and corrections made. 5.4 ***Standard operating procedures*** are developed and maintained. 5.5The recruit, training and evaluation systems are improved and ***HR practices*** compensated.

Variables	**Range**
Parameters	• May include but not limited to: • Working condition • Resources may include: ➢ Human ➢ Material and Machine • Kaizen elements
Kaizen management template	• May include but not limited to: • Visual management board for: ➢ displaying characteristic figures, data and graphics ➢ depicting and controlling processes ➢ identifying and marking sources of risks, setting and standards ➢ displaying company's values and goals of kaizen
Kaizen tools	• May include but not limited to: • 5S (a visual workplace management) • 7 QC tools(Cause and Effect Diagram, Check Sheet , Pareto Diagram , Histogram, Scatter Diagram, Control Chart and Flow Chart) • Brainstorming • Basic Industrial Engineering (IE) tools such as time study, motion study, line balancing, work sampling • JIT (JUST IN TIME) principles

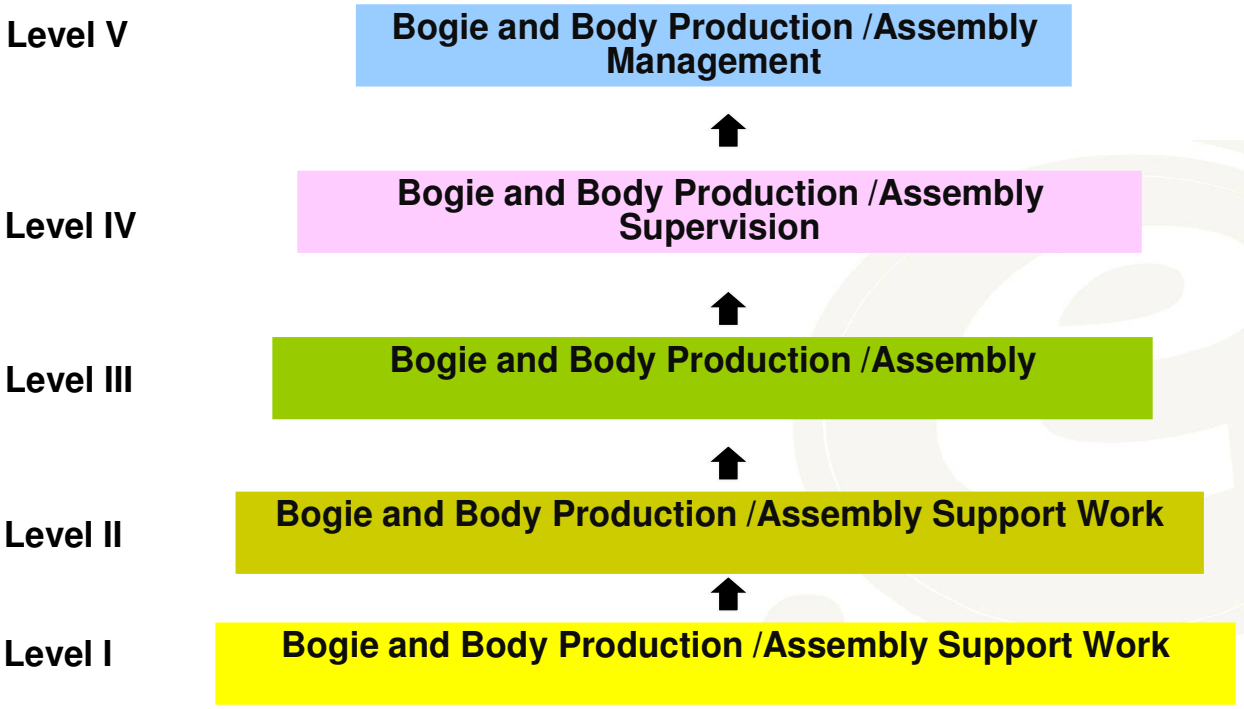
	• MUDA identification and elimination tools • Kanban • Poka-yoke and Takt- time
Gemba activities	• May include but not limited to: • Value-adding activities to satisfy the customer • Employee autonomous operations (participating in team to identify nonconformity, propose solutions and implement them autonomously)
Individual leadership capability	• May include but not limited to: • Personal and interpersonal skills • Courage • Honour and integrity • Energy and drive • Strategic skills • Operating and Organizational positioning skills
Sustainability/continuous improvement	• May include but not limited to: • Improvements made by following PDCA (Plan, Do, Check and Act) cycle for: ➢ Improvements in one's own work ➢ Saving in energy, material and other resources ➢ Improvements in the working environment ➢ Improvements in machines and processes ➢ Improvements in jigs and tools ➢ Improvement in office work ➢ Improvements in product quality ➢ Ideas for new products ➢ Customers services and customer relations
System audit tool	• May include but not limited to: • 5S audit • Patrol system • Kaizen board • 5M check lists and Key Performance Indicators (KPIs)
Standard operating procedure	• May include but not limited to: • Administrative standards for: ➢ Managing the business ➢ Administration ➢ Personnel Guidelines ➢ Job Descriptions ➢ Guidelines for preparing cost information • Operation standards for: ➢ Describing the way a job is done. ➢ Help realising Quality, cost, delivery. ➢ Addressing the need to satisfy customers. ➢ Using the process that's the best. ➢ Producing work in the most cost effective manner. ➢ Assuring total quality for the customer.
HR practices	• May include but not limited to: • Resources may include:

	➢ Recruit and retain high quality people with innovative skills and a good track, record in innovation • HR development is used for: ➢ strategic capability and provide encouragement and facilities for enhancing innovating skills and enhancing the intellectual capital of the organization • Reward will: ➢ Provide financial incentives and rewards and recognition for successful innovation

Evidence Guide	
Critical Aspects of Assessment	Demonstrates skills and knowledge competencies to: • Establish policy and cross-functional goals for kaizen • Deploy and implement goals as directed through policy deployment and cross-functional management. • Realize goals through deployment and audits. • Build systems, procedures, and structures conducive to kaizen. • Use kaizen in functional capabilities. • Introduce Kaizen as a corporate strategy • Provide support and direction between allocating resources • Establish, maintain and upgrade standards. • Make employees conscious through training programs. • Assist employees develop skills and tools for problem solving.
Underpinning Knowledge and Attitude	Demonstrates knowledge of: • Quality management and continuous improvement theories • creativity/innovation theories/concepts • competitive systems and practices tools, including: ➢ 5S ➢ JUST IN Time (JIT) ➢ mistake proofing ➢ process mapping ➢ establishing customer pull ➢ setting of KPIs/metrics ➢ SOP ➢ Kaizen elements/targets. ➢ identification and elimination of waste/MUDA ➢ continuous improvement processes including implementation, monitoring and evaluation strategies for a whole organization and its value stream ➢ Difference between breakthrough improvement and continuous improvement ➢ organizational goals, processes and structure ➢ approval processes within organization ➢ methods of determining the impact of a change

	➢ customer perception of value ➢ Define, Measure, Analyze, Improve and Control (DMAIC) to sustain process
Underpinning Skills	Demonstrates Skills to: • Use leadership skills to foster a commitment to quality and openness to improvement. • Analyze training needs and implementing training programs • Prepare and maintain quality and audit documentation • Undertake self-directed problem solving and decision-making on issues of a broad and/or highly specialized nature and in highly varied and/or highly specialized contexts • Communicate at all levels in the organization and to audiences of different levels of literacy and numeracy • Analyze current state/situation of the organization. • Analyze individually and collectively the implementation of competitive systems and practices tools in the organization and determining strategies for improved implementation • Solve highly varied and highly specialized problems related to competitive systems and practices implementation and continuous improvement to root cause • Negotiate with stakeholders, where required, to obtain information required for implementation and refinement of continuous improvements, including management, unions, employees and members of the community. • Review relevant metrics, including all those measures which might be used to determine the performance of the improvement system, including: ➢ Key Performance Indicators (KPIs) for existing processes ➢ Quality statistics ➢ Delivery timing and quantity statistics ➢ Process/equipment reliability (‘uptime’)
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

BOGIE AND BODY PRODUCTION AND ASSEMBLY



2

Acknowledgement

We wish to extend thanks and appreciation to the many representatives of business, industry, academe and government agencies who donated their time and expertise to the development of this occupational standard.

We would like also to express our appreciation to the Staff and Experts of Locomotive Sub-sector in Metal Engineering Corporation, Federal TVET Agency and Ministry of Education (MoE) who made the development of this occupational standard possible. This occupational standard was developed in January 2017 at Addis Ababa Intercontinental Hotel.

Profile of Participants on Occupational Standard Development in Locomotive Sub-sector						
Roll No.	**Full Name**	**Organization**	**Position**	**Educational Level**	**Address**	
					Mobile	**E-mail**
1.	Seifu Abiyi	Locomotive	Training Unit Manager	First Degree	0921913004	seyfuabiy@yahoo.com
2.	Dereje Deriba	Locomotive	Electric Unit Manager	Level V	0921502433	----------
3.	Samiel Teshome	Locomotive	Design Unit Manager	First Degree	0911373088	Samual-1992@yahoo.com
4.	Yitbarek Abera	Locomotive	Design Unit Worker	First Degree	0923283761	dialyitbarek@gmail.com
5.	Firaol Awoke	Locomotive	Factory Worker	First Degree	0912607854	firaolawake@gmail.com
6.	Mohammed Hassen	Locomotive	Workshop Manager	First Degree	0920046274	muhammedhaso@yahoo.com
7.	Mintesinot Tesfaye	Locomotive	Factory Worker	First Degree	0910089651	Mintesnot.tesfaye23@yahoo.com
8.	Teklu Azene	Locomotive	Maintenance Unit Manager	Level V	0922606660	----------
9.	Yordanos Haile	Locomotive	Design Unit Worker	First Degree	0913487417	Jordiman83@gmail.com
10.	Biruk Yemane	Locomotive	Electrical/Electronics Unit Manager	Level V	0914044841	----------