

Specification

Edexcel NVQ/competence-
based qualifications

Edexcel Level 4 NVQ Diploma in Business- Improvement Techniques (QCF)

For first registration November 2010



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Contents

Qualification title covered by this specification	1
Key features of the Edexcel Level 4 NVQ Diploma in Business-Improvement Techniques (QCF)	3
What is the purpose of this qualification?	3
Who is this qualification for?	3
What are the benefits of this qualification to the learner and employer?	3
What are the potential job roles for those working towards this qualification?	3
What progression opportunities are available to learners who achieve this qualification?	3
What is the qualification structure for the Edexcel Level 4 NVQ Diploma in Business-Improvement Techniques (QCF)?	4
How is the qualification graded and assessed?	9
Assessment Strategy	9
Types of evidence	10
Additional Requirements	11
Centre recognition and approval	12
Centre recognition	12
Approvals agreement	12
Quality assurance	12
What resources are required?	12
Unit format	13
Units	15
Unit 1: Leading effective teams	17
Unit 2: Carrying out project management activities	25
Unit 3: Complying with statutory regulations and organisational safety requirements	31
Unit 4: Leading workplace organisation activities	39
Unit 5: Leading continuous improvement (Kaizen) activities	47
Unit 6: Leading the development of visual management systems	57
Unit 7: Leading the creation of flexible production and manpower systems	65
Unit 8: Leading problem solving activities	73

Unit 9:	Leading an analysis and selection of parts for improvement	83
Unit 10:	Leading lead-time analysis activities	89
Unit 11:	Leading value stream mapping (VSM) activities	95
Unit 12:	Leading set-up reduction activities	103
Unit 13:	Leading total productive maintenance (TPM) activities	111
Unit 14:	Leading statistical process control (SPC) activities	119
Unit 15:	Leading flow process analysis activities	127
Unit 16:	Leading policy deployment activities (Hoshin Kanri, quality operating systems, business plan deployment)	133
Unit 17:	Leading value management (value engineering and value analysis) activities	141
Unit 18:	Leading failure modes and effects analysis (FMEA) activities	149
Unit 19:	Leading measurement systems analysis (MSA) activities	157
Unit 20:	Carrying out design of experiments (DOE)	165
Unit 21:	Leading mistake/error proofing (Poka Yoke) activities	171
Unit 22:	Applying quality function deployment (QFD)	179
Unit 23:	Leading the creation of standard operating procedures (SOP)	185
Unit 24:	Applying response surface methodology	193
Unit 25:	Leading the application of Six Sigma methodology to a project	199
Unit 26:	Leading the carrying out of Six Sigma process mapping	207
Unit 27:	Leading the application of basic statistical analysis	213
Unit 28:	Leading the application of Six Sigma metrics to a project	219
Unit 29:	Leading the production of a characteristic selection matrix	227
Unit 30:	Leading the carrying out of capability studies	235
Unit 31:	Leading the production of multi variance charts	243
Unit 32:	Leading the process of hypothesis testing	251
Unit 33:	Carrying out evolutionary operations (EVOP)	259
Unit 34:	Applying central limit theorem and confidence intervals	265
Unit 35:	Producing Taguchi linear graphs	269
Further information		275
Useful publications		275
	How to obtain National Occupational Standards	275
Professional development and training		276
Annexe A: Progression pathways		277
	The Edexcel qualification framework for the engineering sector	277

Annexe B: Quality assurance	283
Key principles of quality assurance	283
Quality assurance processes	283
Annexe C: Centre certification and registration	285
What are the access arrangements and special considerations for the qualification in this specification?	285
Annexe D: Additional Requirements for qualifications that use the title NVQ within the QCF	287
Annexe E: Assessment Strategy	295

Qualification title covered by this specification

This specification gives you the information you need to offer the Edexcel Level 4 NVQ Diploma in Business-Improvement Techniques (QCF):

Qualification title

Qualification title	Qualification Accreditation Number (QAN)	Accreditation start date
Edexcel Level 4 NVQ Diploma in Business-Improvement Techniques (QCF)	501/1621/6	01/11/2010

This qualification has been accredited within the Qualifications and Credit Framework (QCF) and is eligible for public funding as determined by the Department for Education (DfE) under Sections 96 and 97 of the Learning and Skills Act 2000.

The qualification title listed above features in the funding lists published annually by the DfE and the regularly updated website. It will also appear on the Learning Aims Database (LAD), where relevant.

You should use the QCF Qualification Accreditation Number (QAN), when you wish to seek public funding for your learners. Each unit within a qualification will also have a unique QCF reference number, which is listed in this specification.

The QCF qualification title and unit reference numbers will appear on the learners' final certification document. Learners need to be made aware of this when they are recruited by the centre and registered with Edexcel.

This title replaces the following qualification from 1st November 2010.

Qualification title

Edexcel Level 4 NVQ in Business-Improvement Techniques

Qualification Accreditation Number (QAN)	Accreditation start date	Accreditation end date
500/2920/4	01/08/2007	31/12/2010

Key features of the Edexcel Level 4 NVQ Diploma in Business-Improvement Techniques (QCF)

This qualification:

- is nationally recognised
- is based on the Semta National Occupational Standards (NOS). The NOS, Assessment Strategy and qualification structure are owned by Semta.

What is the purpose of this qualification?

This qualification is appropriate for employees in the engineering sector working across a broad range of areas. It is designed to assess occupational competence in the workplace where learners are required to demonstrate skills and knowledge to a level required in the engineering industry.

Who is this qualification for?

This qualification is for all learners aged 16 and above who are capable of reaching the required standards.

Edexcel's policy is that the qualification should:

- be free from any barriers that restrict access and progression
- ensure equality of opportunity for all wishing to access the qualification.

What are the benefits of this qualification to the learner and employer?

This qualification allows learners to demonstrate competence against National Occupational Standards which are based on the needs of the engineering industry as defined by Semta, the Sector Skills Council. As such it contributes to the development of skilled labour in the sector.

What are the potential job roles for those working towards this qualification?

- Manager
- Manufacturing production manager

What progression opportunities are available to learners who achieve this qualification?

This qualification allows learners to demonstrate competence in business-improvement techniques at a level required by the engineering industry. Learners can progress across the level and size of the engineering competence and knowledge qualifications and into other occupational areas such as team leading and management.

Further information is available in *Annexe A*.

What is the qualification structure for the Edexcel Level 4 NVQ Diploma in Business-Improvement Techniques (QCF)?

Individual units can be found in the *Units* section. The QCF level and credit value are given on the first page of each unit.

To achieve the **Edexcel Level 4 NVQ Diploma in Business-Improvement Techniques (QCF)**

Learners must complete a minimum of 106 credits. Learners must complete all mandatory units in Group A (24 credits) and then choose one of the following pathways:

Edexcel Level 4 NVQ Diploma in Business-Improvement Techniques - Process Improvement (QCF)

Learners must complete all the units in Group B1 and a minimum of six units from Groups B2*, B3 and B4** for a minimum total of 82 credits.

*A minimum of one unit must be taken from Group B2.

**A maximum of three units may be taken from Group B4.

Edexcel Level 4 NVQ Diploma in Business-Improvement Techniques - Quality Improvement (QCF)

Learners must complete all the units in Group C1.

Learners must complete a minimum of five units from Groups C2*, C3** and C4*** for a minimum total of 96 credits.

*A minimum of one unit must be taken from Group C2.

**A minimum of one unit must be taken from Group C3.

***A maximum of three units may be taken from Group C4.

A - Mandatory units

Learners must complete **all** the units in Group A.

L/600/5389 - Leading effective teams

H/600/5396 - Carrying out project management activities

A/601/5013 - Complying with statutory regulations and organisational safety requirements

B - Process Improvement

Learners must complete all the units in Group B1 and a minimum of six units from Groups B2*, B3 and B4**.

*A minimum of one unit must be taken from Group B2.

**A maximum of three units may be taken from Group B4.

B1 - Mandatory units (Process Improvement)

Learners must complete **all** the units in Group B1.

F/600/5406 - Leading workplace organisation activities

M/600/5420 - Leading continuous improvement (Kaizen) activities

M/600/5434 - Leading the development of visual management systems

B2 - Optional units (Process Improvement)

Learners must complete at least **one** unit from Group B1.

K/600/5447 - Leading the creation of flexible production and manpower systems

T/600/5466 - Leading problem solving activities

B3 - Optional units (Process Improvement)

T/600/5483 - Leading an analysis and selection of parts for improvement

K/600/5528 - Leading lead time analysis activities

M/600/5563 - Leading value stream mapping (VSM) activities

T/600/5614 - Leading set-up reduction activities

H/600/5639 - Leading total productive maintenance (TPM) activities

J/600/5665 - Leading statistical process control (SPC) activities

R/600/5684 - Leading flow process analysis activities

R/600/5698 - Leading policy deployment activities (Hoshin Kanri, quality operating systems, business plan deployment)

A/600/5713 - Leading value management (value engineering and value analysis) activities

L/600/5733 - Leading failure modes and effects analysis (FMEA) activities

R/600/5748 - Leading measurement systems analysis (MSA) activities

L/600/5862 - Carrying out design of experiments (DOE)

K/600/5867 - Leading mistake/error proofing (Poka Yoke) activities

J/600/5875 - Applying quality function deployment (QFD)

F/600/5888 - Leading the creation of standard operating procedures (SOP)

B4 - Optional units (Process Improvement)

Learners may complete up to **three** units in Group B4.

- A/600/6036 - Applying response surface methodology
- D/600/5896 - Leading the application of Six Sigma methodology to a project
- T/600/5905 - Leading the carrying out of Six Sigma process mapping
- T/600/5919 - Leading the application of basic statistical analysis
- Y/600/5931 - Leading the application of Six Sigma metrics to a project
- R/600/5944 - Leading the production of a characteristic selection matrix
- L/600/5957 - Leading the carrying out of capability studies
- A/600/5971 - Leading the production of multi variance charts
- K/600/5982 - Leading the process of hypothesis testing
- R/600/5989 - Carrying out evolutionary operations (EVOP)
- K/600/6002 - Applying central limit theorem and confidence intervals
- H/600/6029 - Producing Taguchi linear graphs

C - Quality Improvement

Learners must complete all the units in Group C1.

Learners must complete a minimum of five units from Groups C2*, C3* and C4*.

*A minimum of one unit must be taken from Group C2.

*A minimum of one unit must be taken from Group C3.

*A maximum of three units may be taken from Group C4.

C1 - Mandatory units (Quality Improvement)

Learners must complete **all** the units in Group C1.

- J/600/5665 - Leading statistical process control (SPC) activities
- L/600/5733 - Leading failure modes and effects analysis (FMEA) activities
- D/600/5896 - Leading the application of Six Sigma methodology to a project
- T/600/5905 - Leading the carrying out of Six Sigma process mapping
- T/600/5919 - Leading the application of basic statistical analysis

C2 - Optional units (Quality Improvement)

Learners must complete at least **one** unit from Group C2.

- R/600/5748 - Leading measurement systems analysis (MSA) activities
- L/600/5862 - Carrying out design of experiments (DOE)
- K/600/5867 - Leading mistake/error proofing (Poka Yoke) activities
- Y/600/5931 - Leading the application of Six Sigma metrics to a project
- R/600/5944 - Leading the production of a characteristic selection matrix
- L/600/5957 - Leading the carrying out of capability studies
- A/600/5971 - Leading the production of multi variance charts
- K/600/5982 - Leading the process of hypothesis testing

C3 - Optional units (Quality Improvement)

Learners must complete at least **one** unit from Group C3.

- A/600/6036 - Applying response surface methodology
- J/600/5875 - Applying quality function deployment (QFD)
- R/600/5989 - Carrying out evolutionary operations (EVOP)
- K/600/6002 - Applying central limit theorem and confidence intervals
- H/600/6029 - Producing Taguchi linear graphs

C4 - Optional units (Quality Improvement)

Learners may complete up to **three** units in Group C4.

- F/600/5406 - Leading workplace organisation activities
- M/600/5420 - Leading continuous improvement (Kaizen) activities
- M/600/5434 - Leading the development of visual management systems
- K/600/5447 - Leading the creation of flexible production and manpower systems
- T/600/5466 - Leading problem solving activities
- T/600/5483 - Leading an analysis and selection of parts for improvement
- K/600/5528 - Leading lead time analysis activities
- M/600/5563 - Leading value stream mapping (VSM) activities
- T/600/5614 - Leading set-up reduction activities
- H/600/5639 - Leading total productive maintenance (TPM) activities
- R/600/5684 - Leading flow process analysis activities

- R/600/5698 - Leading policy deployment activities (Hoshin Kanri, quality operating systems, business plan deployment)
- A/600/5713 - Leading value management (value engineering and value analysis) activities
- F/600/5888 - Leading the creation of standard operating procedures (SOP)

How is the qualification graded and assessed?

The overall grade for the qualification is a 'pass'. The learner must achieve all the required units within the specified qualification structure.

To pass a unit the learner must:

- achieve **all** the specified learning outcomes
- satisfy **all** the assessment criteria by providing sufficient and valid evidence for each criterion
- show that the evidence is their own.

The qualification is designed to be assessed:

- in the workplace or
- in conditions resembling the workplace, as specified in the Assessment Strategy for the sector, or
- as part of a training programme.

Assessment Strategy

The Assessment Strategy for this qualification has been included in *Annexe E*. It has been developed by Semta in partnership with employers, training providers, awarding organisations and the regulatory authorities. The Assessment Strategy includes details on:

- criteria for defining realistic working environments
- roles and occupational competence of assessors, expert witnesses, internal verifiers and standards verifiers
- quality control of assessment
- evidence requirements.

Evidence of competence may come from:

- **current practice** where evidence is generated from a current job role
- a **programme of development** where evidence comes from assessment opportunities built into a learning/training programme whether at or away from the workplace
- the **Recognition of Prior Learning (RPL)** where a learner can demonstrate that they can meet the assessment criteria within a unit through knowledge, understanding or skills they already possess without undertaking a course of learning. They must submit sufficient, reliable and valid evidence for internal and standards verification purposes. RPL is acceptable for accrediting a unit, several units or a whole qualification
- a **combination** of these.

It is important that the evidence is:

Valid	relevant to the standards for which competence is claimed
Authentic	produced by the learner
Current	sufficiently recent to create confidence that the same skill, understanding or knowledge persist at the time of the claim
Reliable	indicates that the learner can consistently perform at this level
Sufficient	fully meets the requirements of the standards.

Types of evidence

To successfully achieve a unit the learner must gather evidence which shows that they have met the required standard in the assessment criteria. Evidence can take a variety of different forms including the following examples:

- direct observation of the learner's performance by their assessor
- outcomes from oral or written questioning
- products of the learner's work
- personal statements and/or reflective accounts
- outcomes from simulation, where permitted by the Assessment Strategy
- professional discussion
- assignment, project/case studies
- authentic statements/witness testimony
- expert witness testimony
- reflective accounts
- evidence of Recognition of Prior Learning.

Learners can use one piece of evidence to prove their knowledge, skills and understanding across different assessment criteria and/or across different units. It is, therefore, not necessary for learners to have each assessment criterion assessed separately. Learners should be encouraged to reference the assessment criteria to which the evidence relates.

Evidence must be made available to the assessor, internal verifier and Edexcel standards verifier. A range of recording documents is available on the Edexcel website www.edexcel.com. Alternatively, centres may develop their own.

Additional Requirements

The Joint Awarding Body and the SSC Working Practices Group have identified additional requirements that are needed to assess and quality assure qualifications placed on the QCF that use NVQ within their title. These requirements are shown in *Annexe D: Additional Requirements for Qualifications that use the title NVQ within the QCF*.

Centre recognition and approval

Centre recognition

Centres that have not previously offered Edexcel qualifications need to apply for and be granted centre recognition as part of the process for approval to offer individual qualifications. New centres must complete both a centre recognition approval application and a qualification approval application.

Existing centres will be given 'automatic approval' for a new qualification if they are already approved for a qualification that is being replaced by the new qualification and the conditions for automatic approval are met. Centres already holding Edexcel approval are able to gain qualification approval for a different level or different sector via Edexcel online.

Approvals agreement

All centres are required to enter into an approvals agreement which is a formal commitment by the head or principal of a centre to meet all the requirements of the specification and any linked codes or regulations. Edexcel will act to protect the integrity of the awarding of qualifications, if centres do not comply with the agreement. This could result in the suspension of certification or withdrawal of approval.

Quality assurance

Detailed information on Edexcel's quality assurance processes is given in *Annexe B*.

What resources are required?

Each qualification is designed to support learners working in the Engineering sector. Physical resources need to support the delivery of the qualification and the assessment of the learning outcomes and must be of industry standard. Centres must meet any specific resource requirements outlined in *Annexe E: Assessment Strategy*. Staff assessing the learner must meet the requirements within the overarching Assessment Strategy for the sector.

Unit format

Each unit in this specification contains the following sections.

Unit title:					The unit title is accredited on the QCF and this form of words will appear on the learner's Notification of Performance (NOP).
Unit reference number:					This code is a unique reference number for the unit.
QCF level:					All units and qualifications within the QCF have a level assigned to them, which represents the level of achievement. There are nine levels of achievement, from Entry level to level 8. The level of the unit has been informed by the QCF level descriptors and, where appropriate, the NOS and/or other sector/professional.
Credit value:					All units have a credit value. The minimum credit value is one, and credits can only be awarded in whole numbers. Learners will be awarded credits when they achieve the unit.
Guided learning hours:					A notional measure of the substance of a qualification. It includes an estimate of the time that might be allocated to direct teaching or instruction, together with other structured learning time, such as directed assignments, assessments on the job or supported individual study and practice. It excludes learner-initiated private study.
Unit summary:					This provides a summary of the purpose of the unit.
Assessment requirements/evidence requirements:					The assessment/evidence requirements are determined by the SSC. Learners must provide evidence for each of the requirements stated in this section.
Assessment recording:					This provides a summary of the assessment methodology to be used for the unit.
Learning outcomes:	Assessment criteria:	Evidence type:	Portfolio reference:	Date:	
			The learner should use this box to indicate where the evidence can be obtained eg portfolio page number.	The learner should give the date when the evidence has been provided.	
Learning outcomes state exactly what a learner should know, understand or be able to do as a result of completing a unit.		The assessment criteria of a unit specify the standard a learner is expected to meet to demonstrate that a learning outcome, or a set of learning outcomes, has been achieved.		Learners must reference the type of evidence they have and where it is available for quality assurance purposes. The learner can enter the relevant key and a reference. Alternatively, the learner and/or centre can devise their own referencing system.	

Units

Unit 1: Leading effective teams

Unit reference number: L/600/5389

QCF level: 4

Credit value: 9

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for leading effective teams, which are involved in carrying out continuous improvement projects. It involves obtaining the appropriate authority and support for the release of resources to carry out team activities, which will include people, work space/work area, documentation and information. The learner will be required to determine and agree individual roles and responsibilities, and to set realistic and achievable goals for both the individuals within the team and the team as a whole. Coaching/mentoring and monitoring the performance of the team will also feature in this unit. They will also be expected to prioritise the work activities to achieve the overall objectives, cost-effectively and efficiently.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead/leading is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment methodology

This unit is assessed in the workplace or in conditions resembling the workplace. Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead effective teams	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 work in accordance with the roles and responsibilities identified for the team leader role 1.4 obtain the authority and support for the release of the necessary resources to carry out the team activities 1.5 approve and, where appropriate, consult with colleagues in order to secure the release of the following resources: - people involved - work space/work area required - documentation and information required 1.6 set realistic and achievable goals and objectives for their team, in accordance with the targets set for themselves or for the work area/activity 1.7 evaluate and prioritise the work activities to achieve the objectives, cost-effectively and efficiently			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1b Know how to lead effective teams (continued)	1.8 develop, review and update action plans which clearly identify activities and responsibilities required to meet the team targets: • for themselves • for the team 1.9 determine and agree individual roles and responsibilities, and coach/mentor their team, focusing on the objectives that have been set 1.10 monitor and review the performance of their team against the goals and objectives which have been set, and communicate this to the relevant people 1.11 communicate effectively with: • management • peers • subordinates 1.12 communication must include: • verbal • written • electronic methods 1.13 consult with subject specialists when required, to gain the necessary information to support the team goals and objectives			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.14 deal promptly and effectively with any problems within their control, and report those that cannot be resolved			
2a Know how to lead effective teams	2.1 describe the roles and responsibilities of themselves and others under the health and safety at work act			
	2.2 explain how to plan the resources and time needed to carry out the agreed activity			
	2.3 describe the business targets set for the learner's area of responsibility, and how to set personal, individual and team targets to achieve them (action planning)			
	2.4 explain how to prioritise the learner's own and their team's workload to ensure that targets are met			
	2.5 explain how to communicate effectively, listen, question, support and coach others to work towards the business targets			
	2.6 explain how to present information effectively to management, peers or team members, using different methods			
	2.7 explain how to conduct a team performance review and how to involve the team in brainstorming activities to identify opportunities, threats and solutions			
	2.8 describe the types of conflict and problems that might emerge between work activities			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2b Know how to lead effective teams (continued)	2.9 describe the organisational processes and procedures required to run the learner's area of responsibility effectively (such as quality procedures, code of conduct, standard operations, problem resolution procedures) 2.10 describe the improvement tools and techniques being used in the learner's area of responsibility (such as hourly count monitor, TAKT time, continuous flow process, flexible manpower systems, quality level, defects per million opportunities, workplace organisation) 2.11 describe the specialist help that the learner may require in their area of responsibility, and how this can be obtained 2.12 explain how to structure and lead a team event, and the presentation materials and work documentation required 2.13 explain how to train others in the processes and procedures relevant to them, and the learner's area of responsibility 2.14 explain how to monitor and check that the learner's team is working to identified quality and safety standards 2.15 describe the extent of the learner's own authority, and to whom they should report in the event of problems that they cannot resolve			

Learner name:	_____	Date:	_____
Learner signature:	_____	Date:	_____
Assessor signature:	_____	Date:	_____
Internal verifier signature:	_____	Date:	_____
(if sampled)			

Unit 2: Carrying out project management activities

Unit reference number: H/600/5396

QCF level: 4

Credit value: 10

Guided learning hours: 28

Unit summary

This unit covers the skills and knowledge needed to prove the competences required to carry out project management involved with continuous improvement activities. It involves identifying the need for a project and determining its scope and then developing this into a fully detailed project plan. The learner will be required to form a suitable project team taking into account the technicalities within the project and the individual skills and abilities of the team members. The learner will also be expected to determine and agree the individual roles and responsibilities of the team members and to set realistic and achievable goals for both the individuals within the team and the team as a whole. Obtaining appropriate authority and support for the release of resources to carry out the project is also included and this will include people, work space/work area, documentation and information. Monitoring the performance of the project to ensure that it meets the identified objectives also features in this unit.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Carry out project management activities	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 identify the need for the project and determine the project scope 1.3 develop a full project plan which accurately identifies the project aims and objectives 1.4 develop project plans which clearly identify the following: • full cost of the project • timescale required for the project • resources required • individual tasks within the project • milestones and deliverables to be met 1.5 form the project team comprising of the right mix of personnel to deliver the project objectives 1.6 determine and agree individual roles and responsibilities within the project team 1.7 develop and manage a monitoring process to review the progress of the project, adjusting the project plan as required			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.8 consult with appropriate people in order to secure the release of the following resources: • people involved • work space/work area required • documentation and information required			
1b Carry out project management activities (continued)	1.9 obtain authority and support for the release of the necessary resources to carry out the project 1.10 conduct and manage the project in accordance with the plan consulting with subject experts and specialists according to the needs of the project 1.11 monitor the progress of the project to ensure: • the project objectives will be met • delivered on time • the project keeps within budget • agreed quality standards are met and maintained 1.12 report project progress to relevant parties at the agreed stages 1.13 communicate effectively with: • management • peers			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- project team - customers 1.14 communicate by the following methods: - verbal - written - electronic 1.15 deal promptly and effectively with any problems within their control and report those that cannot be resolved 1.16 report project completion and closure to relevant personnel			
2a Know how to carry out project management activities	2.1 describe the roles and responsibilities of themselves and others under the Health and Safety at Work Act 1974 2.2 explain how to identify the project scope to determine the need for a full project plan and management approval 2.3 explain how to develop specific, measurable, realistic project objectives and deliverables, allowing progress to be monitored and measured 2.4 describe the tools and techniques available for project planning and monitoring			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2b Know how to carry out project management activities (continued)	2.5 explain how to communicate effectively, listen and question, provide feedback, support and coach others			
	2.6 explain how to break the project down into individual deliverable tasks			
	2.7 explain how to form and develop the project team required to meet the identified objectives			
	2.8 explain how to allocate specific tasks and responsibilities to the project team members according to individual skills and abilities			
	2.9 explain how to determine the specialist help the learner may require in the project, and how this can be obtained			
	2.10 explain how to conduct a project meeting			
	2.11 explain how to present information effectively to management, peers, team members and customers			
	2.12 explain how to solve problems and overcome barriers/difficulties encountered during the life of the project			
	2.13 explain who to liaise with and who to obtain relevant and specific information from to support and assist the learner in running the project			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.14 explain how to monitor progress of the project in terms of delivery on time, to budget, with agreed levels of quality 2.15 explain how to report project closure, completion and final status to management, teams and customers 2.16 explain how to agree limits of the learner's own authority within the scope of the project and how to identify, outside of their authority area, whom they should report to in the event of encountering problems that they cannot resolve			

Learner name: _____

Date: _____

Learner signature: _____

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Assessor signature: _____

Date: _____

Internal verifier signature: _____

Date: _____

(if sampled)

Unit 3: Complying with statutory regulations and organisational safety requirements

Unit reference number: A/601/5013

QCF level: 2

Credit value: 5

Guided learning hours: 35

Unit summary

This unit covers the skills and knowledge needed to prove the competences required to deal with statutory regulations and organisational safety requirements. It does not deal with specific safety regulations or detailed requirements. It does, however, cover the more general health and safety requirements that apply to working in an industrial environment.

The learner will be expected to comply with all relevant regulations that apply to their area of work, as well as their general responsibilities as defined in the Health and Safety at Work Act. The learner will need to be able to identify the relevant qualified first aiders and know the location of the first aid facilities. The learner will have a knowledge and understanding of the procedures to be adopted in the case of accidents involving injury and in situations where there are dangerous occurrences or hazardous malfunctions of equipment, processes or machinery. The learner will also need to be fully conversant with their organisation's procedures for fire alerts and the evacuation of premises.

The learner will also be required to identify the hazards and risks that are associated with their job. Typically, these will focus on their working environment, the tools and equipment that they use, the materials and substances that they use, any working practices that do not follow laid-down procedures, and manual lifting and carrying techniques.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1 Comply with statutory regulations and organisational safety requirements	1.1 comply with their duties and obligations as defined in the Health and Safety at Work Act 1.2 demonstrate their understanding of their duties and obligations to health and safety by: • applying in principle their duties and responsibilities as an individual under the Health and Safety at Work Act • identifying, within their organisation, appropriate sources of information and guidance on health and safety issues, such as: – eye protection and personal protective equipment (PPE) – COSHH regulations – risk assessments • identifying the warning signs and labels of the main groups of hazardous or dangerous substances • complying with the appropriate statutory regulations at all times 1.3 present themselves in the workplace suitably prepared for the activities to be undertaken			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.4 follow organisational accident and emergency procedures 1.5 comply with emergency requirements, to include: - identifying the appropriate qualified first aiders and the location of first aid facilities - identifying the procedures to be followed in the event of injury to themselves or others - following organisational procedures in the event of fire and the evacuation of premises - identifying the procedures to be followed in the event of dangerous occurrences or hazardous malfunctions of equipment 1.6 recognise and control hazards in the workplace 1.7 identify the hazards and risks that are associated with the following: - their working environment - the equipment that they use - materials and substances (where appropriate) that they use - working practices that do not follow laid-down procedures 1.8 use correct manual lifting and carrying techniques			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.9 demonstrate one of the following methods of manual lifting and carrying: • lifting alone • with assistance of others • with mechanical assistance 1.10 apply safe working practices and procedures to include: • maintaining a tidy workplace, with exits and gangways free from obstruction • using equipment safely and only for the purpose intended • observing organisational safety rules, signs and hazard warnings • taking measures to protect others from any harm resulting from the work that they are carrying out			
2 Know how to comply with statutory regulations and organisational safety requirements	2.1 describe the roles and responsibilities of themselves and others under the Health and Safety at Work Act, and other current legislation (such as The Management of Health and Safety at Work Regulations, Workplace Health and Safety and Welfare Regulations, Personal Protective Equipment at Work Regulations, Manual Handling Operations Regulations, Provision and Use of Work Equipment			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	Regulations, Display Screen at Work Regulations, Reporting of Injuries, Diseases and Dangerous Occurrences Regulations) 2.2 describe the specific regulations and safe working practices and procedures that apply to their work activities 2.3 describe the warning signs for the seven main groups of hazardous substances defined by Classification, Packaging and Labelling of Dangerous Substances Regulations 2.4 explain how to locate relevant health and safety information for their tasks, and the sources of expert assistance when help is needed 2.5 explain what constitutes a hazard in the workplace (such as moving parts of machinery, electricity, slippery and uneven surfaces, poorly placed equipment, dust and fumes, handling and transporting, contaminants and irritants, material ejection, fire, working at height, environment, pressure/stored energy systems, volatile, flammable or toxic materials, unshielded processes, working in confined spaces) 2.6 describe their responsibilities for identifying and dealing with hazards and reducing risks in the workplace			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.7 describe the risks associated with their working environment (such as the tools, materials and equipment that they use, spillages of oil, chemicals and other substances, not reporting accidental breakages of tools or equipment and not following laid-down working practices and procedures) 2.8 describe the processes and procedures that are used to identify and rate the level of risk (such as safety inspections, the use of hazard checklists, carrying out risk assessments, COSHH assessments) 2.9 describe the first aid facilities that exist within their work area and within the organisation in general and the procedures to be followed in the case of accidents involving injury 2.10 explain what constitute dangerous occurrences and hazardous malfunctions, and why these must be reported even if no one is injured 2.11 describe the procedures for sounding the emergency alarms, evacuation procedures and escape routes to be used, and the need to report their presence at the appropriate assembly point 2.12 describe the organisational policy with regard to fire fighting procedures: the common causes of fire and what they can do to help prevent them			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.13 describe the protective clothing and equipment that is available for their areas of activity 2.14 explain how to safely lift and carry loads, and the manual and mechanical aids available 2.15 explain how to prepare and maintain safe working areas and the standards and procedures to ensure good housekeeping 2.16 describe the importance of safe storage of tools, equipment, materials and products 2.17 describe the extent of their own authority, and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____

Date: _____

Learner signature: _____

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Assessor signature: _____

Date: _____

Internal verifier signature: _____

Date: _____

(if sampled)

Unit 4: Leading workplace organisation activities

Unit reference number: F/600/5406

QCF level: 4

Credit value: 10

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required to lead the application of a systemic approach to continuously making improvements to the workplace organisation. It involves leading the activities that apply the principles and processes of workplace organisation (such as 5S or 5C). The learner will need to set standards and guidelines for the work area and its activity to determine where information, materials, tools and/or equipment are missing or require a new location and what improvements to the area or activity could be made. The learner will be expected to lead the production and/or updating of standard operating procedures and visual controls for the work area, which could cover such things as producing shadow boards to standardise the storage and location of area equipment, colour coding of equipment, cleaning and maintenance of equipment, production operations, and health and safety. The overall objective of the activity will be to make measurable improvements to the workplace organisation.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead workplace organisation activities	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within the learner's area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 lead the activities that apply the principles and process of workplace organisation within the work areas, and establish the area scores 1.4 set standards and guidelines for situations where information, resources or equipment is missing or is in surplus and where improvements can be made 1.5 lead the team activities that make improvements to workplace organisation			
1b Lead workplace organisation activities (continued)	1.6 lead the production and/or updating of standard operation procedures and visual controls that everyone works to within the area 1.7 lead the production and/or updating of standard operation procedures which cover three of the following: - cleaning of equipment/work area - maintenance of equipment - health and safety - process procedures			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• manufacturing operations/working processes • quality systems • regulatory compliance system 1.8 lead the production and/or updating of changes to visual controls, which cover three of the following: • producing shadow boards or an alternative (such as labelled racking and storage systems to standardise the storage and location of area resources and/or equipment • colour coding • line status systems (such as line, process system) • skills matrix • performance measures • process control boards • improvement systems • planning systems 1.9 make measurable improvements to the workplace organisation			
2a Know how to lead workplace organisation activities	2.1 describe the health and safety requirements of the area in which they are leading the workplace organisation activity			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2b Know how to lead workplace organisation activities (continued)	2.2 explain how to plan the resources and time needed to carry out the agreed activity			
	2.3 describe the factors to be considered when selecting a work area for an activity (to include: cleanliness, health and safety, product quality, equipment and organisation)			
	2.4 explain how to plan the resources and time needed to carry out the agreed activity			
	2.5 describe the procedure used to identify and address surplus or missing equipment or resources (such as carrying out a 'red tagging' exercise)			
	2.6 explain how to arrange and label the necessary resources or equipment for rapid identification and access			
	2.7 explain how to correlate information to create or update standard operating procedures or other approved documentation			
	2.8 explain how to evaluate and prioritise the improvements required for the workplace			
	2.9 explain how to score and audit the workplace organisation			
	2.10 describe the techniques required to communicate information using visual control systems (such as shadow boards, performance charts, KPIs)			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.11 describe the extent of the learner's own authority, and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____
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Learner signature: _____
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Date: _____

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Date: _____

(if sampled)

Unit 5: Leading continuous improvement (Kaizen) activities

Unit reference number:	M/600/5420
QCF level:	4
Credit value:	14
Guided learning hours:	32

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for leading continuous improvement (Kaizen) activities in the workplace. It involves approving the plan for the Kaizen process for the agreed work area/activity, to include plan, do, check, act, and to agree quantifiable objectives and targets for the improvement activity. The activities undertaken will include the identification of all forms of waste, and problems or conditions within the work area or activity where improvements can be made. The learner will need to focus on leading the improvement activities which would give business benefits such as reduced product cost, increased capacity and/or flexibility, improved safety, improved regulatory compliance, improved quality, improved customer service, improvements to working practices and procedures, reduction in lead time and reduction/elimination of waste.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead continuous improvement (Kaizen) activities	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within the learner's area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 approve the plan for the Kaizen process to the agreed work area/activity to include plan, do, check, act 1.4 agree objectives and targets for the kaizen activity 1.5 lead the carrying out of the Kaizen activity within the chosen work area/activity 1.6 confirm waste, problems or conditions within the work area or activity and discuss and evaluate what improvements can be made 1.7 confirm and lead improvements within the working area/activity which cover three of the following: - reduction in cost - improved health, safety and/or working environment - improved quality - improved regulatory compliance - improvements to working practices			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• reduction in lead time • reduction in waste and/or energy usage • improved customer service • improved resource utilisation 1.8 lead a structured waste elimination activity, based on the identified wastes, problems or conditions 1.9 lead the production of and approve changes to standard operating procedures (SOPs), or other approved documentation that will sustain the improvements resulting from the Kaizen activity			
1b Lead continuous improvement (Kaizen) activities (continued)	1.10 confirm and lead improvements, which cover three of the following: • cleaning of equipment or work area • maintenance of equipment • health and safety • process procedures • manufacturing operations or work area operations • quality system • regulatory compliance systems 1.11 agree calculated measures of performance for quality, cost and delivery			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.12 agree calculations for one of the following quality measures: • not right first time (as a percentage or as parts per million (PPM)) • company-specific quality measure 1.13 agree calculations for one of the following measures: • delivery schedule achievement • company-specific delivery or service measure 1.14 agree calculations for one of the following cost measures: • parts per operator hour (PPOH) • production volume • value added per person (VAPP) • overall equipment effectiveness (OEE) • stock turns • floor space utilization (FSU) • cost breakdown (such as labour, material, energy and overhead) • company-specific cost measure			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.15 approve the calculations and lead the development of a visual representation of the optimum resources required for a process based on customer demand 1.16 evaluate comparisons of the agreed work area/activity before and after the kaizen activity to confirm improvements using key performance indicators 1.17 show business improvements, using one of the following key performance indicators: • not right first time (as a percentage or as parts per million (PPM)) • company-specific quality measure • delivery schedule achievement • company-specific delivery measure • parts per operator hour (PPOH) • production volume • value added per person (VAPP) • overall equipment effectiveness (OEE) • stock turns • floor space utilization (FSU) • cost breakdown (such as labour, material, energy and overheads)			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2a Know how to lead continuous improvement (Kaizen) activities	company-specific cost measure 2.1 describe the health and safety requirements of the area in which they are leading the kaizen activity 2.2 explain how a work area/activity is selected for the Kaizen activity 2.3 explain how to plan the resources and time needed to carry out the agreed activity 2.4 describe the principles for the deployment of Kaizen (such as where a culture focuses on sustained continuous improvement, aiming at eliminating waste in all systems and processes in the organisation and supply chain) 2.5 describe the eight wastes (over-production, inventory, transport, over-processing, waiting time, operator motion, bad quality, failure to exploit human potential) and how to eliminate them 2.6 explain problem solving and root cause analysis 2.7 describe the importance of understanding the process/activity under review, and how this will affect the quality of the problem solving 2.8 describe the application of the Deming cycle (plan, do, check, act) 2.9 explain how to carry out a Kaizen activity and establish measurable improvements			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2b Know how to lead continuous improvement (Kaizen) activities (continued)	2.10 explain how to distinguish facts from opinions in order to identify improvement actions			
	2.11 explain how improvements to the process are achieved by engaging the knowledge and experience of the people involved in the process			
	2.12 explain how to encourage people to identify potential improvements			
	2.13 explain how to evaluate improvement ideas in order to select those that are to be pursued			
	2.14 explain how to set quantifiable targets and objectives			
	2.15 explain how to produce/propose the creation of, or changes to, standard operating procedures (sops) or other approved documentation			
	2.16 describe the techniques used to visually communicate the work of the Kaizen activity to participants and others			
	2.17 describe the application of the business' key measures of competitiveness (such as the former DTI's seven measures: delivered right first time, delivery schedule achievement, people productivity, stock turns, overall equipment effectiveness, value added per person, floor space utilisation)			
	2.18 explain how the cycle time of a process can be defined			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.19 how to calculate the required production rate for a process by using a calculation (such as Takt Time) 2.20 explain how to calculate the optimal resources (such as people, equipment, facilities and materials) required for a process based on customer demand 2.21 describe the techniques used to distribute work content to balance cycle times to the rate of customer demand, and how to visually represent it (eg line balance and process displays) 2.22 describe the extent of the learner's own authority, and to whom they should report to in the event of problems that they cannot resolve			

Learner name: _____ Date: _____
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 (if sampled)

Unit 6: Leading the development of visual management systems

Unit reference number: M/600/5434

QCF level: 4

Credit value: 9

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for leading the development of visual management systems. It involves discussing and justifying the appropriate parts of the process or work area that will have visual controls and agree the key performance indicators which are to be displayed in the work area. The learner will also be required to monitor the effectiveness of the visual management system and to check the quality of the information that is being displayed.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead the development of visual management systems	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 consider and justify the appropriate parts of the process or work area that will have visual controls 1.4 approve and lead the making of changes to visual management systems			
1b Lead the development of visual management systems (continued)	1.5 agree the key performance indicators that will be displayed in the work area 1.6 lead the production of, and approve changes to, standard operating procedures (SOPs) and visual controls that everyone works to, within the area 1.7 lead the creation and updating of visual management systems that promote six of the following: - health and safety - quality/zero defects - process concerns or corrective actions - performance measures - standard operating procedures			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- workplace organisation - skills matrices - autonomous maintenance worksheets - parts/material control systems - problem resolution (eg Kaizen boards) - shadow boards - standard work-in-progress (WIP) locations and quantities - planning systems - the delivery of effective meetings 1.8 monitor the effectiveness of the visual management system and check the quality of information being displayed			
2a Know how to lead the development of visual management systems	2.1 describe the health and safety requirements of the work area in which they are leading the visual management activities 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 describe the factors to be considered when selecting a visual management 2.4 explain where to find the information required to develop a local visual management system			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.5 describe the visual management systems available to create 'the visual factory' (such as using Kanban systems, card systems, colour coding, floor footprints, graphs, team boards)			
2b Know how to lead the development of visual management systems (continued)	2.6 explain how to differentiate between business performance measures and local performance measures			
	2.7 describe the measures of performance in a lean business environment (such as health, safety and the environment, right first time, cost, delivery, responsiveness, process concerns and corrective actions, performance measures, workplace organisation)			
	2.8 describe the application of measurement techniques required for communicating the visual management within an area and to others who may use the information (such as target versus actual, percentage right first time, Pareto analysis, bar charting, action plans, Paynter charts)			
	2.9 describe the extent of the learner's own authority, and to whom they should report in the event of problems that they cannot resolve			

Learner name:	_____	Date:	_____
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Assessor signature:	_____	Date:	_____
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Unit 7: Leading the creation of flexible production and manpower systems

Unit reference number: K/600/5447

QCF level: 4

Credit value: 7

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for leading the creation of flexible business systems. It involves leading the application of the principles and processes of creating flexible production and manpower systems to the chosen activity. This will include obtaining and approving the schedule and batch size for the parts in the work area, and leading the creation of level schedules for those parts. The activities will require the learner to identify and evaluate improvement opportunities, and waste which needs to be removed, in order to achieve Takt time and flow processing. The learner will also be required to direct the production of a visual representation for identifying which resources do not meet the Takt time requirements. This would typically cover areas such as standard work in progress, consignment stocks, part routers, physical control signals, number of people required and their flexibility, and the rules and disciplines of the pull system.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead the creation of flexible production and manpower systems	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 lead the application of the principles and processes of creating flexible production and manpower systems to the chosen activity 1.4 lead the selection of three different parts or materials in the work area, and approve the calculations for the following: - workload - capacity of resource (equipment, people) - Takt time 1.5 obtain and approve the schedule and batch size for the parts or materials in the work area 1.6 lead the creation of level schedules for the parts in the work area			
1b Lead the creation of flexible production and manpower systems (continued)	1.7 direct the production of a visual communication of the schedule, which includes: - workload - resource capacity			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• Takt time for the work area 1.8 identify and evaluate improvement opportunities, and waste which needs to be removed, in order to achieve Takt time and flow processing 1.9 lead the production of a local workforce flexibility matrix (skills matrix) 1.10 direct the production of a visual representation, identifying resources that do not meet the Takt time requirements 1.11 implement the creation of a visually controlled system, based on the demand of subsequent processes for the chosen parts or materials, which includes four of the following: • standard work in progress • safety stocks • part or material routers • physical control signals • rules and disciplines of the implemented control system 1.12 implement a visually controlled system, based on the demand of subsequent processes for the chosen parts, which improves the overall process effectiveness			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2a Know how to lead the creation of flexible production and manpower systems	2.1 describe the health and safety requirements of the work area in which they are leading the activity 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 describe the information required to create level schedules, load and capacity, Takt time and batch sizes 2.4 describe the meaning of 'level schedules' and how to create them 2.5 explain how to create a load and capacity diagram 2.6 explain Takt time and how this is calculated 2.7 describe the application of standard work in progress 2.8 describe the application of visually controlled systems and signals, based on the demand of subsequent processes 2.9 describe the application of skills matrices 2.10 describe the application of consignment stocking			
2b Know how to lead the creation of flexible production and manpower systems (continued)	2.11 explain how to simplify working practices and reduce the human error risk 2.12 describe the consequences of introducing a new improved part/process/material router 2.13 explain problem solving and route cause analysis			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.14 describe the eight wastes (over-production, inventory, transport, over-processing, waiting time, operator motion, bad quality, failure to exploit human potential) and how to eliminate them 2.15 explain how to stabilise and then optimise equipment effectiveness 2.16 explain how to conduct a review of asset care/best practice effectiveness, and establish a robust routine of asset care and correct operation 2.17 describe the appropriate techniques that provide value to the customer (such as push-pull systems, single piece flow, just in time (JIT), Kanban, automation) 2.18 describe the techniques used to visually communicate the work done (such as level schedules, load and capacity diagrams, revised batch sizes, and takt time) 2.19 explain how to lay out an effective workplace, utilising recognised techniques (such as cellular manufacturing incorporating parallel lines or U-shaped cells) 2.20 describe the extent of their own authority, and to whom they should report in the event of problems that they cannot resolve			

Learner name:	_____	Date:	_____
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Unit 8: Leading problem solving activities

Unit reference number: T/600/5466

QCF level: 4

Credit value: 8

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required to lead problem solving activities, in accordance with approved procedures. Problems could occur in any aspect of the business, such as manufacturing, engineering, processing, service and support functions. The learner will be expected to lead prompt and appropriate action to identify, analyse, approve and implement corrective actions to solve the problem.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead problem solving activities	1.1 lead prompt action to identify the nature and extent of the problems that arise 1.2 lead all of the following as part of the problem solving activity: • ensure that performance monitoring/measurement and review processes are in place (such as the former DTI's seven measures of QCD, the seven quality tools, SPC) • utilise a team-based approach for the problem solving activity • discuss/consult with the relevant people on the nature and extent of the problem • follow a structured problem solving process, and use appropriate techniques to identify the root cause(s) • communicate the proposed corrective action to the relevant people, obtaining feedback where appropriate • prepare a plan of action for implementation of the appropriate corrective action • monitor the implementation of corrective actions, and make necessary revisions to the plan of action (plan, do, check, act)			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• monitor the effectiveness of corrective actions following their implementation • review the effectiveness of corrective actions against the costs of implementation • review the problem solving process to understand the lessons learned, in order to achieve further improvements within the business 1.3 obtain and evaluate all relevant data and information relating to the problem 1.4 obtain and evaluate data on the problem from four of the following sources: • statistical data • historical records (eg maintenance or shift logs) • quality audits • external sources • feedback from customers • mapping the process • operating procedures/manufacturing manuals • company procedures • health and safety information • environmental documents			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• observation • designed and controlled trials/experiments 1.5 evaluate possible root causes to problems by two of the following methods/techniques: • cause and effect diagram • five 'why' analysis • flowcharting • fault tree analysis 1.6 lead an evaluation of all realistic root causes of the problem 1.7 identify and justify the most effective corrective action			
1b Lead problem solving activities (continued)	1.8 justify possible corrective actions to problems, by considering all of the following: • operational effectiveness • ease of implementation • timescale for implementation • financial impact • functionality of the system • environmental impact • staffing implications			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• quality implications • conformity with company policies • health and safety implications • customer delivery implications 1.9 ensure that corrective actions are implemented correctly and promptly 1.10 lead the implementation of corrective actions to problems, which comply with one of the following: • company standards and procedures • BS and/or ISO standards and procedures • customer standards and requirements 1.11 confirm the effectiveness of corrective actions, by using one of the following: • one or more of the former DTI's seven measures of QCD • one or more of the seven quality tools • statistical process control (SPC) 1.12 ensure all relevant people are kept informed of progress throughout the problem solving activity 1.13 communicate with the relevant people throughout the problem solving activity, by using both of the following:			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• verbal communication • completion of company-specific documentation (paper or IT based) 1.14 confirm that corrective actions to problems comply with all relevant regulations and guidelines			
2a Know how to lead problem solving activities	2.1 describe the health and safety requirements of the area in which they are leading the problem solving activity 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 describe the importance of wearing protective clothing and other appropriate safety equipment during the investigation of the problem, and where it may be obtained 2.4 explain methods used to detect that a problem has occurred 2.5 explain methods of containment of a non-conforming product or process 2.6 explain a structured process for problem solving (such as DMAIC methodology - Define, Measure, Analyse, Improve, Control) 2.7 describe the processes and procedures used within the scope of the problem solving activity			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2b Know how to lead problem solving activities (continued)	2.8 explain how to obtain any necessary resources to support the problem solving activity			
	2.9 describe the extent of their own responsibility, and to whom they should report if they have problems that you cannot resolve			
	2.10 describe the use of performance measurement and analysis to direct and focus improvement effort			
	2.11 describe the techniques used to obtain data and information on problems (such as the former DTI's seven measures of QCD), and the sources of information			
	2.12 describe the methods and techniques involved in evaluating information (such as the seven quality tools, is/is not sheets, capability studies, measurement system analysis)			
	2.13 describe the importance of getting to the root cause			
	2.14 describe the methods and techniques involved in root cause analysis (such as five 'why' analysis, cause and effect diagrams, fault tree analysis, flowcharting, FMEA, process flow analysis)			
	2.15 describe the criticality of different types of problems, and how to prioritise the problems to be solved			
	2.16 explain how to obtain and interpret company policy and procedures			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.17 describe the factors that have to be taken into account when selecting the corrective action to a problem 2.18 explain methods used to choose and implement corrective actions (such as decision matrix, design of experiments, Gantt chart, Deming cycle (plan-do-check-act), error proofing) 2.19 explain whom to inform of actions taken, and by what means 2.20 describe reporting procedures and documentation, and their application 2.21 explain methods used to monitor the effectiveness of corrective actions (such as statistical process control (SPC), the former DTI's seven measures of QCD, seven quality tools) 2.22 explain how to review the problem solving process to understand the lessons learned, in order to achieve further improvements within the business			

Learner name: _____ Date: _____
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 Internal verifier signature: _____ Date: _____
 (if sampled)

Guided learning hours: 32

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead an analysis and selection of parts for improvement	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 coordinate the collecting of all the information, documentation and equipment required to carry out the activity 1.4 coordinate and lead an analysis of information to identify and confirm the representative parts for improvement within the chosen area/product range			
1b Lead an analysis and selection of parts for improvement (continued)	1.5 lead an analysis against three of the following criteria: - customer schedules (volume) - cost of producing the part - profit for each part, as a percentage - manufacturing lead time - quality (scrap and non-conformance percentage) - process/manufacturing route 1.6 approve an evaluation and grouping of the identified parts into appropriate part families			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.7 lead the production of part families, using all the following criteria: • part shape • part size • materials used to manufacture the part • manufacturing process 1.8 lead the production of and confirm a finalised list of the representative parts for the chosen area/product range			
2a Know how to lead an analysis and selection of parts for improvement	2.1 describe the health and safety requirements of the work area in which you are leading the activity 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 describe the information required to conduct the activity, and where and from whom authority can be found 2.4 describe the principles and process of analysis (such as, pie charts, bar charts (Pareto analysis)) 2.5 describe the techniques used to communicate the information and results gained by this process 2.6 explain how to create and present bar graphs/histograms			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2b Know how to lead an analysis and selection of parts for improvement (continued)	2.7 explain how to differentiate between lead time and cycle time 2.8 explain how the bill of materials (bom) structure is configured for each of the representative parts 2.9 explain how to identify the origin/source of the parts within the chosen area 2.10 explain how to evaluate the information, in order to select the representative parts for the chosen area 2.11 explain the application of problem solving and root cause analysis 2.12 describe the extent of their own authority, and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____ Date: _____

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(if sampled)

Unit 10: Leading lead-time analysis activities

Unit reference number: K/600/5528

QCF level: 4

Credit value: 9

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for lead-time analysis activities. It involves leading the principles and processes of lead time analysis to selected parts or processes. The learner will be expected to lead the identification of suitable parts or processes for which lead time profiles are to be produced, and then to review and confirm suitable and quantifiable objectives and targets for the reduction in lead time and the creation of lead time profiles for all of the representative parts or processes chosen.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead- time analysis activities	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within the learner's area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 lead the collection and coordination of information/data to produce a frequency diagram, listing the major bottlenecks or constraints as identified by each lead time profile 1.4 review and confirm quantifiable objectives and targets for the reduction in lead-time of the chosen parts or processes 1.5 lead the lead-time analysis activity, and the production of lead-time profiles for all of the representative parts or processes chosen			
1b Lead-time analysis activities (continued)	1.6 evaluate and confirm any problems or conditions within the work area where improvements can be made 1.7 lead improvement opportunities for three of the following: - supply or delivery of parts - improved workflow - improved quality			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- flexibility of people - launch of material - inventory balancing 1.8 lead the production of revised lead time profiles, identifying the improved process 1.9 lead the production of a plan of the improvement activities and resources required, with timescales to achieve the targeted lead-time			
2a Know how to lead-time analysis activities	2.1 describe the health and safety requirements of the work area in which they are leading the activity 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 describe the information required to create lead-time profiles 2.4 describe the information required to construct the lead-time profiles, and where this information can be obtained 2.5 explain how to coordinate and create lead-time profiles			
2b Know how to lead-time analysis activities (continued)	2.6 explain how to coordinate and create frequency charts 2.7 describe the techniques used to communicate the information and results obtained by this process			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.8 explain how to differentiate between lead-time and cycle time 2.9 explain applying problem solving and root cause analysis (such as Ishikawa diagrams, brainstorming) 2.10 describe the extent of their own authority, and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____ Date: _____

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Unit 11: Leading value stream mapping (VSM) activities

Unit reference number: M/600/5563

QCF level: 4

Credit value: 13

Guided learning hours: 32

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for leading value stream mapping (VSM) activities. It involves leading the application of the principles and processes of value stream mapping to the approved parts, using appropriate improvement tools and techniques. The learner will be expected to lead the creation of a current state map for the parts or materials chosen, and to confirm problems or conditions within the current state map where improvements can be made. Typically, the improvements will include improved workflow, improved lead time, improved quality, reduced waste and improved safety.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

Your ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead value stream mapping (VSM) activities	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within the learner's area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 approve the selection of appropriate parts or materials on which the activity is to be carried out 1.4 lead the value stream mapping process on the chosen parts, using appropriate improvement tools and techniques 1.5 lead the creation of and approve a current state map for the parts or materials chosen to include all of the following: - part or material flow through the process - information flow - inventory - set-up and cycle times for each operation - lead-time for the part or material - value-adding percentage of lead time - delays which occur between each operation - Takt time and schedules for the chosen part			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1b Lead value stream mapping (VSM) activities (continued)	- customer and supplier ordering and delivery 1.6 confirm problems or conditions within the current state map where improvements can be made 1.7 confirm opportunities for improvements and waste that needs to be removed, in order to create a future state map covering three of the following: - improved workflow - improved lead time - improved quality - improved safety - less inventory - improved flexibility - less waste/cost 1.8 lead the production of and approve a future state map to include all of the following: - part or material flow through the process - information flow - inventory - set-up and cycle times for each operation - lead time for the part or material - value-adding percentage of lead time			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- delays which occur between each operation - Takt time and schedules for the chosen part - customer and supplier ordering and delivery 1.9 lead the implementation of the changes identified			
2a Know how to lead value stream mapping (VSM) activities	2.1 describe the health and safety requirements of the area in which they are leading the value stream mapping activity 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 explain how a part is selected for a value stream mapping activity 2.4 explain from whom authority is gained for release of people and resources for the value stream mapping activity 2.5 explain how to structure and run a value stream mapping event 2.6 describe the principles and processes for the deployment of value stream mapping 2.7 explain how improvements to the process can be achieved 2.8 explain how to evaluate improvement ideas and select those that will give the greatest benefit for the least spend			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.9 explain how to set quantifiable objectives and targets for the future state maps			
2b Know how to lead value stream mapping (VSM) activities (continued)	2.10 explain how to create standard operating procedures (SOPs)			
	2.11 describe the techniques used to visually communicate the information and results of the process			
	2.12 describe the techniques of problem solving and root cause analysis			
	2.13 explain systems lead time, how they differ from actual lead time, and how both are constructed			
	2.14 explain how to calculate Takt time			
	2.15 describe the principles of increasing process capacity			
	2.16 explain what constitutes value-adding and non-value adding activities			
	2.17 describe the extent of their own authority, and to whom they should report in the event of problems that they cannot resolve			

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Unit reference number:	T/600/5614
QCF level:	4
Credit value:	14
Guided learning hours:	32

This unit covers the skills and knowledge needed to prove the competences required for leading set-up reduction activities. It involves coordinating the principles and processes of set-up reduction to a machine or process set-up, changeover, clean-down or turnaround activity that is a bottleneck or constraint which affects the process, such as capacity, flexibility, lead time, inventory or other business performance measure. The learner will be expected to confirm where the problems occur within the set-up process, and to confirm where improvements can be made. The learner will need to agree suitable quantifiable objectives and targets against which the improvements are to be made. The activities will require them to coordinate the set-up reduction activities on different machines or processes, and to coordinate improvements to the current set-up, which will include such things as reduced set-up time, improved safety, improved quality and improved work practice.

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead set-up reduction activities	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 approve the identification of a machine or process set-up activity that is a bottleneck or constraint which affects productivity 1.4 coordinate the set-up reduction activity on the chosen machine or process, using the appropriate techniques 1.5 confirm problems or conditions within the current set-up, where improvements can be made			
1b Lead set-up reduction activities (continued)	1.6 agree quantifiable objectives/targets for improvements to the chosen set-up 1.7 coordinate improvements to the current set-up which cover three of the following: - reduced set-up time - improved safety - improved quality - improved work practice - improved regulatory compliance			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- reduced cost 1.8 coordinate improvements to the current set-up, to meet the identified objectives and targets 1.9 approve the production of changes to standard operating procedures (SOPs) or other approved documentation that will sustain the improvements made to the set-up requirements 1.10 coordinate improvements to the new set-up, which covers three of the following: - all of the new steps, and the time required for each step - differentiation between internal and external steps - standard equipment and its location (eg cutting tools, clamps, hand tools, inspection equipment) - information required for a quick set-up, and its location (such as CNC programs, drawings and manufacturing instructions) - methods and standards - documentation for coordination control			
2a Know how to lead set-up reduction activities	2.1 describe the health and safety requirements of the area in which they are leading the set-up reduction activities			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 explain how a machine or process is selected for a set-up reduction activity 2.4 explain from whom authority is gained for the release of people and resources for the set-up reduction activity 2.5 describe the application of the Deming cycle (plan, do, check, act) 2.6 explain how to structure and run a set-up reduction activity 2.7 explain how improvements to the set-up can be achieved 2.8 explain how to evaluate improvement ideas and select those that will give most benefit for the least spend			
2b Know how to lead set-up reduction activities (continued)	2.9 explain how to set quantifiable targets and objectives for the improved set-up 2.10 explain how to correlate information to create or update standard operating procedures (sops) or other approved documentation for the revised set-up 2.11 explain how to distinguish between internal and external activities with reference to set-up			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.12 explain problem solving and the application of root cause analysis 2.13 describe the difference between 'motion' and 'work' 2.14 explain what constitutes a value-adding and non-value adding activity 2.15 describe the extent of their own authority, and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____ Date: _____

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(if sampled)

Guided learning hours: 32

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead total productive maintenance (TPM) activities	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 approve the selection of the appropriate asset on which to carry out the total productive maintenance activity 1.4 lead the total productive maintenance process on at least two assets from the following: - plant and equipment - machines - office equipment - service equipment - utilities 1.5 obtain and approve the necessary information to carry out the activity 1.6 lead the carrying out of the total productive maintenance activity using the appropriate techniques			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.7 lead the total productive maintenance process, and show how one of the following is undertaken: • assess criticality of equipment/process condition and identify refurbishment needs • identify an integrated asset care plan for both operator and maintenance staff			
1b Lead total productive maintenance (TPM) activities (continued)	1.8 use the overall equipment effectiveness (OEE) measure and information to confirm which elements of the OEE and their associated losses need improvement 1.9 lead the collection of information relating to all of the following: • load or demand • capacity • Takt time or bottleneck analysis 1.10 approve and use an action plan which will reduce/eliminate the losses, and hence improve the overall equipment effectiveness 1.11 lead the implementation of improvements to working practices through the total productive maintenance activities 1.12 confirm improvements to working practices through three of the following: • initial cleaning			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• countermeasures for cause and effect of dust and dirt • cleaning and lubrication standards • general inspection • autonomous inspection • workplace organisation • full circle implementation of autonomous maintenance 1.13 carry out all of the following total productive maintenance activities: • autonomous maintenance (front line asset care) • condition-based maintenance (predictive) • planned maintenance steps (fixed interval)			
2a Know how to lead total productive maintenance (TPM) activities	2.1 describe the health and safety requirements of the area in which they are leading the total productive maintenance (TPM) activities 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 describe the principles of TPM, and how they can be applied in administration procedures, safety improvement and quality maintenance			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.4 explain how to select an asset on which to carry out the TPM activity (assets could be plant and equipment, machines, office equipment, service equipment, utilities) 2.5 explain how to implement a systematic and structured approach to carrying out autonomous, condition-based and planned maintenance 2.6 describe the difference between a chronic and sporadic loss, and the countermeasures to both 2.7 explain how to calculate overall equipment effectiveness (OEE) 2.8 explain where to find the information required to calculate the OEE for the chosen asset 2.9 describe the benefits of having a TPM system 2.10 describe the importance of taking ownership of the TPM system, and the issues that can be expected to be resolved			
2b Know how to lead total productive maintenance (TPM) activities (continued)	2.11 describe the six major losses and how loss-reduction actions need to be prioritised 2.12 describe the use of standard operating procedures, single point lessons and machine/process start-up and shutdown procedures 2.13 explain an awareness of the improvement activities that will drive the implementation of the TPM activities (Kaizen and team working)			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.14 explain critical processes and early problem detection steps 2.15 explain loss areas and opportunities for improvement 2.16 explain standards of wear and the ability to stabilise the component life 2.17 describe the techniques of visual management used to communicate the information and results obtained by this process (including TPM activity boards and checklists) 2.18 describe the integration with workplace organisation and improving OEE 2.19 explain contaminants and sources of contaminants 2.20 describe the extent of their own authority and to whom they should report in the event of problems that they cannot resolve			

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(if sampled)

Guided learning hours: 25

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead statistical process control (SPC) activities	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 work to, and ensure compliance with, all the required process monitoring documentation and work instruction sheets 1.4 approve the process on which the process analysis is to be carried out 1.5 consult with relevant people and lead the gathering of the necessary data for analysis 1.6 lead the application of the principles and processes of statistical process control to the chosen process			
1b Lead statistical process control (SPC) activities (continued)	1.7 lead the performing of basic statistical process control, using appropriate tools and techniques 1.8 lead the use of statistical and graphical methods to represent the process conditions 1.9 approve the capability of the process, identifying: - Cp - Cpk			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.10 lead the production of charts for process and control information, to include three from: • simple run charts • tally charts • bar charts • histograms • box plots • time series charts • Pareto diagrams • stem and leaf plots • run charts 1.11 agree activities, which will improve the process performance 1.12 approve the production of an action plan to implement the improvements			
2a Know how to lead statistical process control (SPC) activities	2.1 describe the health and safety requirements of the area in which they are leading the process control activities 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 explain where process control fits within a continuous improvement environment			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.4 explain how process performance affects customer satisfaction and process costs 2.5 explain where and why statistical process control is used, the benefits, and how it is applied 2.6 describe the importance of standardisation within a process operation, and why process performance can only be determined when it is controlled 2.7 explain how process control can improve process performance 2.8 describe the benefits of prevention and detection 2.9 describe the two types of variation within a process (common cause, special cause), and the impact they have within the process			
2b Know how to lead statistical process control (SPC) activities (continued)	2.10 explain how to gather data and effectively analyse it; how the data can be used to communicate abnormalities within a process 2.11 describe the main types of control charts used for spc, their features and benefits, and how to construct and implement them 2.12 describe the meaning of a 'population' and a 'sample' 2.13 describe the measurements of central tendency and variability, and how they are calculated			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.14 describe the properties of a normal curve of distribution 2.15 explain how to create charts or diagrams (such as run charts, histograms, box plots, time series charts, pareto diagrams, and stem and leaf plots) 2.16 explain how to explain the terms and calculate mean, median, mode, standard deviation, range and variance 2.17 explain how to explain and calculate process capability (Cp and Cpk) 2.18 describe the extent of their own authority, and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____ Date: _____
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 Assessor signature: _____ Date: _____
 Internal verifier signature: _____ Date: _____
 (if sampled)

Unit 15: Leading flow process analysis activities

Unit reference number: R/600/5684

QCF level: 4

Credit value: 14

Guided learning hours: 32

Unit summary

This unit covers the skills and knowledge needed to prove the competences required to lead flow process analysis activities. It involves coordinating the application of the principles and procedures of flow process analysis, within a given work area, to lead to the production of a process analysis sheet. The learner will be required to discuss and agree elements of waste and problems or conditions within the process where improvements can be made. The learner will need to lead an evaluation and prioritisation of the opportunities for improvement, and to assist in this activity they will be required to approve the content of a payback matrix.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead flow process analysis activities	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 coordinate the flow process analysis mapping activity within a given work area 1.4 lead the production of and approve a flow process analysis sheet 1.5 discuss and agree opportunities for improvement within the process			
1b Lead flow process analysis activities (continued)	1.6 lead an evaluation of the opportunities for improvement, and approve the prioritisation of these using suitable criteria 1.7 lead an analysis of the data obtained into both: - non-value added activity - value-added activity 1.8 agree quantifiable objectives and targets for all the defined improvement activities			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.9 lead the creation of, and agree on, an action plan which: • eliminates non-value added activity • simplifies value-added activity			
2a Know how to lead flow process analysis activities	2.1 describe the health and safety requirements of the area in which they are leading the flow process analysis activities 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 explain how to describe a process in its elements/activities of work 2.4 describe the eight forms of waste within a lean working environment 2.5 describe the symbols and abbreviations used for flow process analysis (such as those defined by the American Standard for Methods Engineering (asme) - to include operation, inspection, transport, waiting, storage) 2.6 explain how to map out a process or deployment flowchart, using the recognised symbols 2.7 explain what are classed as value-added and non-value added activities			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2b Know how to lead flow process analysis activities (continued)	2.8 explain how to establish which of the elements/activities in the process are value-added or non-value added 2.9 explain how to identify opportunities for improvements to the process 2.10 explain how to use data to eliminate activities that do not add value to the process 2.11 explain how to construct an action plan that will simplify the value-added activities and eliminate the non-value added activities 2.12 explain how to construct an action plan (such as payback matrix) 2.13 describe the extent of their own authority, and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____

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(if sampled)

Date: _____

Unit 16: Leading policy deployment activities (Hoshin Kanri, quality operating systems, business plan deployment)

Unit reference number: R/600/5698

OCF level: 4

Credit value: 9

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for leading policy deployment activities (Hoshin Kanri, quality operating systems, business plan deployment). It involves leading the application of the principles and processes of business plan deployment in the learner's local area, and agreeing the area goals for the customer and the business they work in, to enable improvement opportunities and conditions to be approved which, when implemented, will deliver the local area policy deployment plan.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead policy deployment activities (Hoshin Kanri, quality operating systems, business plan deployment)	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 evaluate the current policy deployment plan 1.4 lead the policy deployment process in your local area and agree the area goals 1.5 confirm the area goals for: - customers - the business in which they work			
1b Lead policy deployment activities (Hoshin Kanri, quality operating systems, business plan deployment) (continued)	1.6 approve improvement opportunities and conditions which, when implemented, deliver the local area policy deployment plan 1.7 use at least four of the following criteria when approving improvement opportunities: - is there local commitment to deliver the improvement plan? - is the plan communicated to everyone in the business? - are all employees aware of, and engaged, in the local policy plan?			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- do local measures reflect policy deployment plans? - are policy review dates adhered to? - are cross-functional boundaries eliminated? - are improvement actions linked to the policy deployment plan? 1.8 confirm quantifiable objectives and targets for all the defined improvement activities, and agree an appropriate measure and timescale for completion 1.9 lead the production of and approve the policy deployment plan and communicate the plan in an appropriate visual format 1.10 lead the production of a visual communication of the plans, which must include all of the following: - the resources required - measures of performance - timescales for completion - review dates of each activity - assigned ownership and responsibility for each action - the order of importance of each improvement activity			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2a Know how to lead policy deployment activities (Hoshin Kanri, quality operating systems, business plan deployment)	2.1 describe the health and safety requirements of the work area in which they are leading the improvement activities 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 explain where to find the information required to develop a local policy deployment plan 2.4 explain how to create policy deployment plans 2.5 describe the techniques used to communicate the information and results obtained by this process 2.6 explain how to differentiate between your business vision, mission and main business drivers			
2b Know how to lead policy deployment activities (Hoshin Kanri, quality operating systems, business plan deployment) (continued)	2.7 explain measures of performance in a lean business environment 2.8 describe the limits of your responsibility and involvement in the policy deployment planning process 2.9 describe the types of improvement activity that will drive the implementation of the business plan (eg management tools and techniques which contribute to quality, cost, delivery and responsiveness) 2.10 describe the meaning and application of the Deming cycle (plan, do, check, act)			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.11 describe the application of gap analysis (current situation versus desired situation)			
	2.12 describe the extent of their own authority, and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____ Date: _____

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Guided learning hours: 32

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead value management (value engineering and value analysis) activities	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 lead the application of the principles and processes of value management (VM) to the chosen product or process 1.4 confirm what the customer requires from the product or the process and approve quantifiable objectives and targets for the value management activity 1.5 lead the analysis of the functions of the product or process being studied and agree allocated costs to those functions			
1b Lead value management (value engineering and value analysis) activities (continued)	1.6 lead the production of a total cost model and supply a chain map for the product or process, which shows how cost are related to function 1.7 confirm the non-value added activity within the product or process, and approve alternatives 1.8 lead the development of these alternatives into detailed proposals that will improve the value of the product or process			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.9 lead the production of detailed proposals of the findings of the value management activities which: • identify the non-value added activities and indicate alternatives • prioritise and rank the alternatives • include a risk assessment of the alternatives • identify the most appropriate alternatives • provide costing recommendations for management approval • identify expected benefits 1.10 approve the new value-added process and manage the plan within agreed timescales			
2a Know how to lead value management (value engineering and value analysis) activities	2.1 describe the health and safety requirements of the work area in which they are leading the value management activities 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 explain how to select a product or process on which to carry out the value management activity 2.4 explain how to structure and run a value management activity 2.5 explain how to set quantifiable objectives and targets for the value management activity			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.6 explain how to carry out a function analysis 2.7 describe the performance related tools used to qualify customer wants and needs 2.8 describe the 'cost of function' equation, and how to calculate the cost of function 2.9 explain FAST diagramming and value trees 2.10 explain decision making and creativity techniques (brainstorming)			
2b Know how to lead value management (value engineering and value analysis) activities (continued)	2.11 explain how value management relates to the overall business strategy and competitive positioning 2.12 explain how to produce a total cost model and supply chain map for the product or process 2.13 explain what constitutes value adding and non-value adding activities 2.14 explain how to identify what a customer requires from a product or process 2.15 explain how to prioritise and rank the alternatives 2.16 explain how to complete a risk assessment of the alternatives 2.17 explain how to prepare the findings into proposals			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.18 explain how to monitor and track proposals to implementation			
	2.19 describe the extent of their own authority, and to whom they should report in the event of problems that they cannot resolve			

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Assessment recording

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Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead failure modes and effects analysis (FMEA) activities	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 agree the key features of failure modes and effects analysis required for the activity under investigation 1.4 lead the carrying out of a failure modes and effects analysis on two of the following: - concept - product - design - process - system - machine 1.5 agree, for the activities analysed: - the potential failure modes - the potential effects from failure modes - the potential causes of failure modes 1.6 coordinate the production of a failure modes and effects analysis			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1b Lead failure modes and effects analysis (FMEA) activities (continued)	1.7 check the recording of the information gathered in an appropriate format 1.8 approve the score for all of the following: • the likely occurrence of potential failure modes • the severity of the potential failure modes • the likelihood of detection of the potential failure modes 1.9 consider and approve valid judgements about the activity using failure modes and effects analysis principles 1.10 approve the risk priority numbers (RPNS) calculations, agree high RPNS, and agree actions to improve them 1.11 check rating tables for all of the following: • occurrence • severity • detection 1.12 lead the reassessment of a failure modes and effects analysis once actions have been completed, and review the re-score of severity, occurrence and detection			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2a Know how to lead failure modes and effects analysis (FMEA) activities	2.1 describe the health and safety requirements of the area in which they are leading the failure modes and effects analysis 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 describe the main features and benefits of carrying out a failure modes and effects analysis 2.4 explain who should be part of a team that constructs and updates a failure modes and effects analysis 2.5 explain system FMEA, concept FMEA, design FMEA and process FMEA - what they are and where they should use them 2.6 describe the meaning of failure mode, failure effect and failure cause 2.7 describe the rating scale used in failure modes and effects analysis projects, to include the severity rating scale, the occurrence rating scale and the detection rating scale			
2b Know how to lead failure modes and effects analysis (FMEA) activities (continued)	2.8 explain how to calculate a risk priority number (rpn) 2.9 explain how to use the risk priority numbers 2.10 explain how to apply a structured approach to risk reduction			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.11 explain when to start a failure modes and effects analysis 2.12 explain when to update a failure modes and effects analysis 2.13 describe the roles and responsibilities of individuals within a failure modes and effects analysis team 2.14 describe the extent of their own authority within the project and to whom they should report in the event of problems that they cannot resolve			

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(if sampled)

Guided learning hours: 25

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead measurement systems analysis (MSA) activities	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) • monitor the progress of improvement activities • deal with any organisational problems identified during the improvement activity 1.3 approve the selection of an appropriate measurement system on which to carry out the analysis 1.4 lead the carrying out of a measurement system analysis, which includes three from the following: • completing a calibration study on a gauge • conducting a gauge linearity study • completing either an attribute or a variable gauge repeatability and reproducibility study • conducting a metrology study on a measurement system which includes either a variable or attribute gauge repeatability and reproducibility study 1.5 obtain and approve all the necessary data in order to carry out the measurement systems analysis			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1b Lead measurement systems analysis (MSA) activities (continued)	1.6 lead the carrying out of the analysis, using the appropriate techniques 1.7 agree the type of measurement system variation, to include two of the following: • bias • linearity • stability • accuracy • repeatability • reproducibility 1.8 confirm the recording of the results of the analysis in the appropriate format 1.9 agree the percentage gauge repeatability and reproducibility of the measurement system under study, and approve ways of improving the measurement system 1.10 lead the production of a measurement systems analysis report, detailing ways of improving the measurement system under study			
2a Know how to lead measurement systems analysis (MSA) activities	2.1 describe the health and safety requirements of the area in which they are leading the measurement systems analysis			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 explain why we should study our measurement systems 2.4 explain how to select a measurement system for analysis 2.5 describe the possible sources of measurement systems variation 2.6 describe the use of measurement systems analysis, and how it can be used in a six sigma improvement project 2.7 explain how to conduct a variable and a attribute repeatability and reproducibility study			
2b Know how to lead measurement systems analysis (MSA) activities (continued)	2.8 describe the terminology used in measurement system analysis (such as bias, linearity, stability, accuracy, repeatability, discrimination, resolution, reproducibility) 2.9 explain how to conduct a measurement systems analysis study 2.10 explain how to calculate gauge repeatability and reproducibility 2.11 explain how to calculate gauge precision and tolerance			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.12 explain industry rules for repeatability and reproducibility results			
	2.13 describe the extent of their own authority within the project and to whom they should report in the event of problems that they cannot resolve			

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Unit 20: Carrying out design of experiments (DOE)

Unit reference number: L/600/5862

QCF level: 4

Credit value: 9

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for carrying out design of experiments (DOE). It involves applying the principles and process of design of experiments to the selected plant or process, which will require the plant or process being taken out of production to run the methodology. The learner will need to calculate the correct sample size required and identify a suitable sampling plan to reduce any systematic errors. The learner will be expected to determine the scope/parameters of the experiment and carry out the experiment within these parameters utilising the appropriate tools and techniques. The results of the design of experiment will be recorded and analysed to identify areas where improvements to the process can be made. The learner will also need to produce a report of the findings along with an action plan to ensure the improvements identified are implemented.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Carry out design of experiments (DOE)	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 select an appropriate process on which to carry out the design of experiment and obtain all the necessary data 1.3 determine the scope/parameters of the experiment 1.4 utilise sample size selection to ensure the statistical validity of the experiment and calculate the correct sample size required for the experiment 1.5 estimate the resources and expected benefits for the design of experiment undertaken 1.6 document the resources required to include: • financial • timescales • manpower • plant/equipment • materials 1.7 identify a suitable sampling plan to reduce systematic errors			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1b Carry out design of experiments (DOE) (continued)	1.8 carry out a design of experiment within an improvement project utilising the appropriate tools and techniques 1.9 for the experiment undertaken identify: • a suitable Alpha risk level • a suitable Delta that needs to be observed • a suitable Beta level 1.10 Determine the correct experimental design to use from one of the following: • full factorial • 2k factorial • fractional factorial 1.11 record the results of the design of experiment in the appropriate format 1.12 analyse the data gathered and identify areas where improvements to the process can be made 1.13 calculate and produce graphs for the following: • main effects • interactions 1.14 produce a design of experiment report which includes an action plan to ensure the improvements			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2a Know how to carry out design of experiments (DOE)	2.1 describe the health and safety requirements of the area in which they are carrying out an experiment 2.2 explain why we need to use design of experiments and how this benefits an improvement project 2.3 explain how to determine the scope of an experiment 2.4 explain how to carry out a design of experiment project and the tools and techniques used 2.5 explain where to obtain the data required to carry out the design of experiment 2.6 explain how to calculate the sample size to be used in the design of experiment 2.7 explain what is meant by Alpha risk and Beta risk			
2b Know how to carry out design of experiments (DOE) (continued)	2.8 explain how to use the data obtained to calculate: mean, median, mode, standard deviation, range and variance 2.9 explain how to calculate and graphically display main effects and interactions 2.10 explain what is the meaning of a population and a sample in terms of the design of experiment 2.11 explain how to design a suitable array for the designs to include full factorial, 2k factorial and fractional factorial			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.12 explain how to design an array to assess the selected interactions from the designs to include full factorial, 2k factorial and fractional factorial			
	2.13 describe the extent of their own authority and whom they should report to, in the event of problems that they cannot resolve			

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Unit 21: Leading mistake/error proofing (Poka Yoke) activities

Unit reference number: K/600/5867

QCF level: 4

Credit value: 9

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for leading of mistake/error proofing (Poka Yoke) activities, which is a method of making an activity 'foolproof'. It involves leading the application of the principles and procedures of mistake/error proofing to the chosen activity, to enable worksheets to be produced for the activity that identify the problem, evaluate any actions to be taken, and indicate the benefits to be gained. Typically, worksheets would focus on the description of the mistake/error identified, the containment action taken, the root cause of the mistake/error and the permanent corrective action to be taken. The learner will be required to lead trials on the suggested improvements, which will include confirming their effectiveness, cost and complexity.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead mistake/error proofing (Poka Yoke) activities	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 use information and data to approve the selection of a suitable process on which the mistake/error proofing activity is to be carried out 1.4 lead the application of the mistake/error proofing process to the chosen activity 1.5 use appropriate techniques to analyse the data received, and confirm valid conclusions 1.6 evaluate recommendations and lead the production of worksheets for the activity that identify the problem and actions to be taken			
1b Lead mistake/error proofing (Poka Yoke) activities (continued)	1.7 lead the creation of a worksheet of the mistake/error proofing activity, identifying: - the description of the mistake/error identified - the containment action taken - the root cause of the mistake/error - the permanent corrective action to be taken			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.8 agree suitable solutions, and manage the carrying out of agreed trials to measure the effectiveness of the solution 1.9 approve suitable solutions and determine their: • effectiveness • cost • complexity 1.10 confirm and coordinate the implementation of the optimum solution 1.11 lead the measurement and documentation of the results 1.12 identify the benefits of mistake/error proofing in terms of: • improved quality/compliance (such as ISO9001) • reduced costs • delivery or service			
2a Know how to lead mistake/error proofing (Poka Yoke) activities	2.1 explain how to define a mistake/error proofing activity, and the benefits of carrying this out 2.2 describe the difference and benefits between mistake/error proofing and prevention and detection 2.3 explain how to plan the resources and time needed to carry out the agreed activity			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.4 describe the selection criteria used to determine a suitable product or process on which to carry out the mistake/error proofing activity 2.5 explain how mistake/error proofing can lead to zero defects 2.6 describe the relationship between errors and defects 2.7 describe the different types and range of mistakes 2.8 explain how defects originate in products or processes 2.9 explain how the role of source inspection contributes to the reduction of defects			
2b Know how to lead mistake/error proofing (Poka Yoke) activities (continued)	2.10 describe the application of mistake/error proofing (Poka Yoke) tools (such as 'cause and effect', and the five 'whys') 2.11 describe the type of mistake/error proofing documentation, and the information it should contain 2.12 describe the analysis and charting methodology used for mistake/error proofing 2.13 describe the financial implications of mistake/error proofing projects			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.14 describe the relationship between mistake/error proofing and other continuous improvement processes (such as workplace organisation 5S/5C, quick changeovers, cellular manufacturing, total productive maintenance, structured problem solving and visual management) 2.15 explain how to undertake trials and measure the effectiveness of mistake/error proofing projects 2.16 describe the different types and range of mistake proofing devices used 2.17 describe the roles and responsibilities of individuals within a mistake/error proofing team, including facilitator, timekeeper, scribe 2.18 describe the extent of their own authority within the activity and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____ Date: _____
 Learner signature: _____ Date: _____
 Assessor signature: _____ Date: _____
 Internal verifier signature: _____ Date: _____
 (if sampled)

Unit 22: Applying quality function deployment (QFD)

Unit reference number: J/600/5875

QCF level: 4

Credit value: 9

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for applying quality function deployment (QFD). It involves identifying the customer requirement of a product or process and obtaining all the required information necessary to perform the QFD project study. Typically, these would cover the needs and expectations of the customer and the functions and features required by the customer. The learner will be required to produce a matrix for the quality function deployment activity, which identifies the four phases (eg pre-planning, design deployment, process and production planning and managing deployment). The learner will need to analyse the information gathered (such as score matrices for relationships, technical requirements, correlations, planning and specifications) and draw conclusions as to the appropriate course of action. The learner will be expected to record the results of the analysis in the appropriate format to enable a report to be compiled, outlining the findings of the activity and the recommended solutions.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Apply quality function deployment (QFD)	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 identify the customer requirement of a product or process using quality function deployment 1.3 obtain all the required information necessary to perform the quality function deployment study 1.4 produce a matrix for a quality function deployment project which identifies the four phases as follows: • pre-planning • design deployment • process and production planning • managing deployment 1.5 determine the customer requirements within the project in terms of: • needs and expectations • functions • features 1.6 carry out the quality function deployment project			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1b Apply quality function deployment (QFD) (continued)	1.7 identify within the quality function deployment project the: • necessary inputs and how to acquire them • the outputs from each of the four phases and their execution • customer rankings • substitute quality characteristics 1.8 analyse the information gathered and draw conclusions as to the appropriate course of action 1.9 record the results of the analysis in the appropriate format 1.10 produce and score matrices for three of the following: • relationships • technical requirements • correlations • planning • specifications 1.11 produce a report outlining the findings and the recommended solutions			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2a Know how to apply quality function deployment (QFD)	2.1 describe the health and safety requirements of the area in which they are carrying out the quality function deployment activity 2.2 describe the advantages of using quality function deployment 2.3 describe the 'quality lever' and how quality function deployment fits this model 2.4 describe the terms 'house of quality' and 'voice of the customer' 2.5 explain how quality function deployment relates to potential failure modes and affects analysis, design of experiments, value analysis, control plans, Pugh concept diagrams 2.6 explain how to carry out a quality function deployment activity and the tools and techniques used			
2b Know how to apply quality function deployment (QFD) (continued)	2.7 describe the four phases of quality function deployment (pre-planning, design deployment, process and production planning, managing deployment) 2.8 explain how to identify the necessary inputs and outputs for each of the phases 2.9 explain what the customer's requirements are within the project, in terms of needs and expectations, features and functions			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.10 explain how to produce matrices for relationships, specifications, technical requirements and planning 2.11 explain how to score the matrices within the quality function deployment 2.12 describe the extent of their own authority within the project and whom they should report to, in the event of problems they cannot resolve			

Learner name: _____ Date: _____

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Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(if sampled)

Guided learning hours: 25

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead the creation of standard operating procedures (SOP)	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) • monitor the progress of improvement activities • deal with any organisational problems identified during the improvement activity 1.3 lead the production of a standard operating procedure for two of the following: • cleaning of equipment • maintenance of equipment • health, safety and environmental practices and procedures • process procedures • manufacturing operations • quality improvements • improvements to customer satisfaction 1.4 lead the production of standard operating procedures that include all of the following: • operation/process to be performed • part/product number and part/product description/operation reference • operation/process number			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• preparation activities prior to starting the operation/process • description of the full operation/process, broken down into appropriate tasks/activities • quality standards, health and safety requirements, environmental issues/requirements • tooling/fixtures/gauges/equipment required • sketches/photographs/drawings that assist completion of the operation/process • date of first issue • originator of the document • latest revision date 1.5 Lead the gathering of information of the current operation or process to identify the optimum and safest method 1.6 Agree what tools, equipment, fixtures, documentation and standards are required			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1b Lead the creation of standard operating procedures (SOP) (continued)	1.7 ensure that all team members performing the operation or process have the opportunity to contribute and agree the method identified 1.8 lead the production of standard operating procedures in an agreed format and monitor their accuracy against the operation or process requirements 1.9 lead the production of standard operating procedures that minimise all of the following: • time • effort • waste 1.10 arrange for the supply of standard operating procedures at their point of use and the storage of copies and master copies in accordance with company requirements 1.11 lead the revision of standard operating procedures, as appropriate, to ensure their effectiveness in the workplace 1.12 establish confirmation that the method defined will meet quality, productivity, health, safety and environmental requirements			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2a Know how to lead the creation of standard operating procedures (SOP)	2.1 describe the health and safety requirements of the area for which they are leading the creation of standard operating procedures (SOP) 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 describe the various formats used in creating SOP 2.4 explain where to find the sop document format to be used in their business 2.5 describe the information that will be required to create a SOP 2.6 explain how SOP are structured and the importance of their use 2.7 explain methods of communicating/facilitating to ensure that all the required information for the SOP is captured			
2b Know how to lead the creation of standard operating procedures (SOP) (continued)	2.8 describe the operation/process to be captured in the SOP 2.9 explain why SOP are the basis for quality and continuous improvement 2.10 describe the eight wastes (over-production, inventory, transport, over-processing, waiting time, operator motion, bad quality, failure to exploit human potential) and how to eliminate them			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.11 explain how to simplify work done, eliminating waste and potential for human error 2.12 explain Takt time and the relationship with achieving flow in a process 2.13 describe the extent of their own authority and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____

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(if sampled)

Unit 24: Applying response surface methodology

Unit reference number: A/600/6036

QCF level: 4

Credit value: 9

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for applying response surface methodology. It involves selecting an appropriate process on which to carry out the activity and applying the principles and processes of response surface methodology utilising orthogonal array, level and factor. The learner will be expected to determine the scope/parameters of the activity, estimate the resources required (which will include costs, timescales, manpower, plant/equipment and materials) and identify the expected benefits to be gained by carrying out the activity. The learner will be required to utilise sample size selection to ensure the statistical validity of the experiment and calculate the correct sample size methodology within an improvement project.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Apply response surface methodology	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 select an appropriate process on which to carry out the response surface methodology and obtain all the required information 1.3 estimate the resources and expected benefits for the response surface methodology and gain approval 1.4 utilise sample size selection to ensure the statistical validity of the experiment and calculate the correct sample size required 1.5 determine the scope/parameters of the response surface methodology activity 1.6 carry out the response surface methodology within an improvement project utilising the appropriate tools and techniques			
1b Apply response surface methodology (continued)	1.7 carry out response surface methodology utilising: • orthogonal array • level • documentation and information required 1.8 record the results of the project in the appropriate format			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.9 document the resources required to include: • financial • timescales • manpower • plant/equipment • materials 1.10 analyse the data gathered and identify areas where improvements could be made 1.11 identify for the response surface methodology undertaken: • a suitable alpha risk level • a suitable delta that needs to be observed • a suitable beta level • steepest ascent for the surface design 1.12 identify suitable optimum conditions and produce a response surface methodology report which includes an action plan to ensure the improvements are implemented			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2a Know how to apply response surface methodology	2.1 describe the health and safety requirements of the area in which they are carrying out the response surface methodology 2.2 describe the use of response surface methodology and how it can be used in a Six Sigma improvement project 2.3 explain how to carry out a response surface methodology project and the tools and techniques used 2.4 explain where to obtain the required data necessary to carry out the project 2.5 explain how to calculate a statistically valid sample size to be used in the response surface methodology activity 2.6 explain what is the meaning of population and a sample in terms of the response surface methodology activity			
2b Know how to apply response surface methodology (continued)	2.7 explain what is meant by a method of steepest ascent 2.8 explain what is meant by the terms 'coded variables' and 'uncoded variables' 2.9 explain what is meant by Alpha risk and Beta risk 2.10 explain how to use the data collected to calculate: mean, median, mode, standard deviation, range and variance			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.11 explain how to calculate cost benefits when considering response methodology			
	2.12 describe the extent of their own authority within the project and whom they should report to, in the event of problems that they cannot resolve			

Learner name: _____ Date: _____
 Learner signature: _____ Date: _____
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 Internal verifier signature: _____ Date: _____
(if sampled)

Guided learning hours: 32

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead the application of Six Sigma methodology to a project	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) • monitor the progress of improvement activities • deal with any organisational problems identified during the improvement activity 1.3 lead the application of the structured Six Sigma methodology and approach to the selected project 1.4 lead and participate in Six Sigma projects which cover two the following: • manufacturing • quality level • administration 1.5 lead the utilisation of the five phases of Six Sigma within the project: • define • measure • analyse • improve • control			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.6 approve the Six Sigma organisational infrastructure, roles and responsibilities and business-specific metrics that would apply			
1b Lead the application of Six Sigma methodology to a project (continued)	1.7 lead the production of a diagram (family tree) of the Six Sigma organisational infrastructure and the roles of: • Champion • Mentor • Yellow Belt • Green Belt • Black Belt • Master Black Belt 1.8 lead the production of a metric chart for the Six Sigma projects undertaken: • financial • quality • process 1.9 agree areas where the Six Sigma tools, techniques and activities can be applied and direct the need to measure those factors that are critical to quality characteristic (CTQC) for the customer, business and process			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.10 identify the critical to quality characteristic (CTQC) of the projects, to include: • cost • quality • delivery 1.11 contribute to the identification of the cost of poor quality, by agreeing the defects per million opportunities (DPMO) 1.12 establish defects per million opportunities to the sigma score and determine the gap to Six Sigma performance			
2a Know how to lead the application of Six Sigma methodology to a project	2.1 describe the Six Sigma methodology and how it is applied to a project 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 describe the Six Sigma infrastructure and philosophy 2.4 describe the benefits that will arise from a six sigma project 2.5 describe the 'parts per million opportunities' goal of six sigma 2.6 describe the calculation of defects per million opportunities (DPMO)			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.7 describe the five phases of Six Sigma that are applied to a project			
2b Know how to lead the application of Six Sigma methodology to a project (continued)	2.8 explain how to define a critical to quality characteristic (CTQC)			
	2.9 explain how non-value added activity can serve as a roadblock for achieving Zero Defect			
	2.10 explain how to define an 'opportunity for defect'			
	2.11 describe the roles and responsibilities of the key players in the Six Sigma process (Champion, Mentor, Master Black Belt, Black Belt, Green Belt and Yellow Belt)			
	2.12 describe the relationship between key process input variables (KPIV) and key process output variables (KPOV) (using the equation $Y=f(x)$)			
	2.13 describe the extent of their own authority and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____ Date: _____
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 (if sampled)

Unit 26: Leading the carrying out of Six Sigma process mapping

Unit reference number: T/600/5905

QCF level: 4

Credit value: 14

Guided learning hours: 32

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for leading the carrying out of a Six Sigma process mapping activity. It requires the learner to approve the selection of a suitable process on which to carry out the process mapping activity, and to agree the key stages that form the overall process under investigation. These would be the process input variables and the process output variables, and would include things which are controllable, critical, noise, and standard operating procedures.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead the carrying out of Six Sigma process mapping	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 approve the selection of a suitable process on which to carry out the process mapping activity 1.4 agree the key stages that form the overall process under investigation 1.5 lead the collection of the data necessary to construct the Six Sigma process map 1.6 lead the construction of the process map for the Six Sigma project			
1b Lead the carrying out of Six Sigma process mapping (continued)	1.7 lead the production of a process map, which identifies: - the key process input variables - the key process output variables 1.8 confirm both the key process input variables and the key process output variables as one or more of the following: - controllable - critical			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• noise • standard operating procedure 1.9 confirm the value-added and non-value added steps in a process 1.10 identify and agree improvements to the process as a result of the information gathered in the Six Sigma mapping activity 1.11 agree and have included on the process map the specifications of both the: • key process input variables • key process output variables			
2a Know how to lead the carrying out of Six Sigma process mapping	2.1 describe the health and safety requirements of the area in which they are leading the process mapping activity 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 describe the benefits of carrying out Six Sigma process mapping 2.4 explain what a Six Sigma process map is and how it is constructed 2.5 explain how the Six Sigma process map integrates within a Six Sigma project			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.6 describe what is meant by key process input variables (KPIVs) and key process output variables (KPOVs)			
2b Know how to lead the carrying out of Six Sigma process mapping (continued)	2.7 describe the data collection point for the key process input variables and key process output variables (such as gauges, forms and samples)			
	2.8 explain what the main types of key process input variables and key process output variables are in terms of being controllable, critical, noise, or standard operating procedures			
	2.9 explain who should create a Six Sigma process map			
	2.10 describe the difference between a value-added activity and a non-value added activity			
	2.11 describe the roles and responsibilities of individuals within a process mapping team			
	2.12 describe the extent of their own authority within the project, and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____ Date: _____
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 Internal verifier signature: _____ Date: _____
 (if sampled)

Unit 27: **Leading the application of basic statistical analysis**

Unit reference number: T/600/5919

QCF level: 4

Credit value: 10

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for leading the application of basic statistical analysis, by consulting with the appropriate people and leading the gathering relevant data for statistical analysis on a Six Sigma project. The learner will need to lead the use of the data gathered to produce descriptive statistics, which cover mean, median, mode, standard deviation, range and variance for the selected representative sample. The learner will be expected to lead the recording of the statistics gathered, using a variety of techniques that could include bar charts, histograms, Pareto diagrams, stem and leaf diagrams, box plots and time series charts. The learner will also be required to approve the production of an action plan as a result of the statistical and graphical analysis undertaken.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead the application of basic statistical analysis	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) • monitor the progress of improvement activities • deal with any organisational problems identified during the improvement activity 1.3 consult with appropriate people and lead the gathering of the relevant data for statistical analysis 1.4 direct the production of data gathering forms or charts to gather information to enable statistical and graphical analysis to take place 1.5 lead the recording of the collected data, utilising three of the following methods: • bar charts • histograms • Pareto diagrams • stem and leaf diagrams • box plots • time series charts			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1b Lead the application of basic statistical analysis (continued)	1.6 lead the use of statistical and graphical analysis on a Six Sigma project 1.7 lead the production of descriptive statistics of data, to include all of the following: • mean • median • mode • standard deviation • range and variance 1.8 lead the production of a normal distribution to assess a population from the representative sample 1.9 interpret the statistical data collected, in order to validate and approve the pre-determined courses of action 1.10 approve the production of an action plan as a result of the statistical and graphical analysis undertaken			
2a Know how to lead the application of basic statistical analysis	2.1 describe the health and safety requirements of the area in which they are leading the collecting of data 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 describe the meaning of 'variation', how this can be detected with statistics and how this variation can affect a process			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.4 describe the number of data points needed to draw a statistically valid conclusion 2.5 explain why we need to use basic statistics 2.6 describe the meaning of the terms 'population' and 'sample' when applied to basic statistics			
2b Know how to lead the application of basic statistical analysis (continued)	2.7 explain distribution curves and the properties of a normal curve 2.8 explain how to create and use charts and diagrams (such as histograms, box plots, time series charts, pareto diagrams, stem and leaf diagrams) 2.9 explain how to calculate mean, median, mode, standard deviation, range and variance 2.10 describe the difference between descriptive and inferential statistics 2.11 describe the extent of their own authority within the project, and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____ Date: _____
 Learner signature: _____ Date: _____
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 Internal verifier signature: _____ Date: _____
 (if sampled)

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead the application of Six Sigma metrics to a project	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 lead Six Sigma metrics activities on both: - products - processes 1.4 consult with appropriate personnel and lead the gathering of the necessary data to produce a metric graph 1.5 for the selected activity, lead the application of six sigma metrics to monitor the process and justify improvements 1.6 confirm, for each of the activities covered: - defects per million opportunities - defects per unit - rolled through put yield (Yrt) - the sigma score			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1b Lead the application of Six Sigma metrics to a project (continued)	1.7 confirm and approve metrics, which are: • long term • short term • variable or attribute 1.8 approve both primary and secondary metrics for the Six Sigma project 1.9 agree where appropriate to transform variable data to attribute data 1.10 direct the use of the data collected to complete a primary metric graph 1.11 use the graph produced to identify and approve where improvements to metrics can be made 1.12 approve an action plan that will bring about the improvements			
2a Know how to lead the application of Six Sigma metrics to a project	2.1 describe the health and safety requirements of the area in which they are leading the Six Sigma metrics activity 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 describe the main features and benefits of carrying out a Six Sigma metrics activity 2.4 describe the importance of using metrics to drive a six sigma project			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.5 explain how to calculate defects per million opportunities, defects per unit and rolled through put yield 2.6 explain how to utilise Z tables to calculate the sigma score 2.7 describe the time period necessary to calculate a meaningful baseline 2.8 explain how to set realistic objectives and targets for the Six Sigma metrics activity			
2b Know how to lead the application of Six Sigma metrics to a project (continued)	2.9 explain how to gather the data required for inclusion in a metric chart 2.10 explain how to construct a Six Sigma metric chart 2.11 describe the relationship between 'parts per million', 'defects per million opportunities', Yrt and the sigma score 2.12 describe the difference between variable and attribute data 2.13 explain why it is advantageous to transform attribute data into variable data 2.14 explain how to transform attribute data into variable data 2.15 describe the significance of the 1.5S shift, and how it can be utilised to infer long-term metric values			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.16 describe the extent of their own authority within the project and to whom they should report in the event of problems that they cannot resolve			

Learner name: _____ Date: _____
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 Internal verifier signature: _____ Date: _____
(if sampled)

Unit 29: Leading the production of a characteristic selection matrix

Unit reference number: R/600/5944

QCF level: 4

Credit value: 9

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for leading the production of a characteristic selection matrix. It involves working with the customer to agree the customer requirements and manage the application of a characteristic selection matrix to the Six Sigma project to create greater customer satisfaction. The learner will need to lead the collection of the necessary data and lead the production of a characteristic selection matrix for the chosen activity by managing the five-step process for generating the matrix. This will require listing the customer key process output variables, scoring the key process output variables, listing the key process input variables that impact the customer key process output variables, numerically rating the interaction between key process input variables and customer key process output variables and using ranking to prioritise future team focus. The learner will then be expected to use this information to identify and approve activities in the process where improvements can be made.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead the production of a characteristic selection matrix	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 work with the customer to agree the customer requirements and manage the application of a characteristic selection matrix to the Six Sigma project 1.4 lead the production of a characteristic selection matrix for two of the following: - concept - product - design - process - system - machine 1.5 lead the five-step process for generating a characteristic selection matrix: - list the customer key process output variable - score the key process output variables			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- list the key process input variables that impact the customer key process output variables - numerically rate the interaction between key process input variables and customer key process output variables - use ranking to prioritise future team focus			
1b Lead the production of a characteristic selection matrix (continued)	1.6 lead the collection of all the required data necessary to create the matrix 1.7 lead the production of a characteristic selection matrix for the chosen activity 1.8 use the characteristic selection matrix produced to agree scoring parameters for: - customers - team members 1.9 use the matrix produced to identify and approve activities in the process where improvements can be made 1.10 lead the preparation of and approve an action plan that will bring about the improvements			
2a Know how to lead the production of a characteristic selection matrix	2.1 describe the health and safety requirements of the area in which they are leading the characteristic selection matrix activity 2.2 explain how to plan the resources and time needed to carry out the agreed activity			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2b Know how to lead the production of a characteristic selection matrix (continued)	2.3 explain what is a characteristic selection matrix; why we need to produce them; and who should create a characteristic selection matrix			
	2.4 explain how to generate a characteristic selection matrix using the five-step process			
	2.5 explain what is meant by the term 'customer' when producing a characteristic selection matrix			
	2.6 explain what are key process output variables and key process input variables			
	2.7 explain where in the quality function deployment matrix the characteristic selection matrix appears			
	2.8 describe the inter-relationship between a characteristic selection matrix and a potential failure modes and effects analysis			
	2.9 describe the inter-relationship between Six Sigma process mapping and a characteristic selection matrix			
	2.10 explain how to score a characteristic selection matrix			
	2.11 explain how a process map links into a characteristic selection matrix			
	2.12 explain how a characteristic selection matrix links into a potential failure modes and effects analysis			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.13 explain how to utilise the results of a characteristic selection matrix			
	2.14 explain how to prioritise a Six Sigma project team's focus			
	2.15 describe the extent of their own authority within the project and whom they should report to, in the event of problems that they cannot resolve			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(if sampled)

Unit 30: Leading the carrying out of capability studies

Unit reference number: L/600/5957

QCF level: 4

Credit value: 14

Guided learning hours: 32

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for leading the carrying out of capability studies. It involves obtaining and approving all the necessary data needed to carry out the study analysis, and agreeing the appropriate sample size using statistical based techniques. From the study, the learner will be required to lead the production of statistical information. This will include calculations for mean, mode, median, standard deviation, range, variance, and the capability indices C_p and C_{pk} for the process. The learner will also need to approve calculations for the sigma score (Z) from the C_{pk} and the parts per million outside upper and lower specification limits for the processes studied for both the long and short term.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead the carrying out of capability studies	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 lead a capability study, which covers both: - the short term - the long term 1.4 obtain and approve all the necessary data needed to carry out the capability study analysis 1.5 agree the appropriate sample size using statistical based techniques 1.6 determine whether rational sub-grouping is appropriate			
1b Lead the carrying out of capability studies (continued)	1.7 lead the process capability study and confirm relevant statistics 1.8 confirm the calculation of the following statistics: - mean - median - mode - standard deviation			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• range • variance 1.9 confirm the calculation of the following from the above statistics: • the capability indices Cp and Cpk for the process • the sigma score (Z) from the Cpk • the parts per million outside upper and lower specification limits for the processes studied 1.10 lead the production of a histogram to represent the Cp and Cpk graphically 1.11 obtain and approve the information gained and agree activities to improve the process capability 1.12 lead the production of and approve a process capability report highlighting the improvements to be made and the actions to be taken			
2a Know how to lead the carrying out of capability studies	2.1 describe the health and safety requirements of the area in which they are leading the capability studies 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 explain why we need to assess process capability and how this affects a Six Sigma project 2.4 explain what is meant by the term Sigma Score (Z)			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2b Know how to lead the carrying out of capability studies (continued)	2.5 explain how to calculate the Sigma Score (Z) and use this to estimate the percentage outside of specification			
	2.6 explain what Cp and Cpk are and how are they calculated			
	2.7 explain how to calculate long term capability from short-term data			
	2.8 explain how many samples are needed for a statistically valid short term capability study			
	2.9 explain what a population is and what a sample is			
	2.10 explain how to select appropriate sample sizes			
	2.11 explain how to calculate parts per million			
	2.12 explain how to calculate mean, median, mode, standard deviation, range, and variance			
	2.13 explain how to perform rational sub-grouping			
	2.14 describe the extent of their own authority within the project and whom they should report to, in the event of problems that they cannot resolve			

Learner name:	_____	Date:	_____
Learner signature:	_____	Date:	_____
Assessor signature:	_____	Date:	_____
Internal verifier signature:	_____	Date:	_____
(if sampled)			

Unit 31: Leading the production of multi variance charts

Unit reference number: A/600/5971

QCF level: 4

Credit value: 9

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for leading the production of multi-variance charts. It involves approving the selection of a suitable activity on which to carry out the multi-variance charting process, consulting with the appropriate people and directing the gathering of the relevant data necessary for the analysis. The learner will be required to use the data collected to lead the production of a data demographics form for the process and subsequently approve a multi-variance chart showing within part variation, piece-to-piece variation and time-to-time variation. The learner will need to lead on the recording and displaying of the information using a variety of techniques such as bar charts, histograms, Pareto diagrams, stem and leaf diagrams, box plots and time series charts. The learner will also be expected to approve a report of the activity highlighting the opportunities for improvement and manage an action plan, which makes recommendations on how they can be implemented.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Unit specific additional assessment requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead the production of multi-variance charts	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 lead the production of multi-variance charts for two of the following: - concept - product - design - process - system - machine 1.4 approve the selection of a suitable activity on which to carry out the multi-variance charting process 1.5 consult with the appropriate people and direct the gathering of the relevant data necessary for the multi- variance charting analysis			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.6 lead the recording of the collected data utilising at least three of the following techniques: • bar charts histograms • Pareto diagrams • stem and leaf diagrams • box plots • time series charts			
1b Lead the production of multi- variance charts (continued)	1.7 lead the production of a data demographics form for the selected activity 1.8 use the data demographics form to approve a multi- variance chart showing: • within-part variation • piece-to-piece variation • time-to-time variation 1.9 obtain and approve a multi-variance chart on the activity selected 1.10 discuss and approve opportunities for improvement from the multi-variance chart 1.11 lead the creation of an action plan that minimises variation and approve recommendations on how the improvements can be implemented			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2a Know how to lead the production of multi-variance charts	2.1 describe the health and safety requirements of the area in which they are directing the gathering of the data for a multi-variance chart activity 2.2 explain how to plan the resources and time needed to carry out the agreed activity 2.3 explain why we need to carry out multi variance charting and the benefits to be gained from this activity 2.4 explain how to construct a data demographics form and a multi-variance chart 2.5 explain how to assess the chart for within-piece variation, piece-to-piece variation and time-to-time variation			
2b Know how to lead the production of multi-variance charts (continued)	2.6 explain how much data needs to be gathered to draw statistically valid conclusions from the chart 2.7 explain how to draw further conclusion by utilising tools such as bar charts, box plots, histograms, stem and leaf diagrams, Pareto diagrams and time series charts 2.8 describe the benefits of multi-variance analysis with respect to design of experiment 2.9 describe the extent of their own authority within the project and whom they should report to, in the event of problems that they cannot resolve			

Learner name: _____ Date: _____
Learner signature: _____ Date: _____
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(if sampled)

Unit 32: Leading the process of hypothesis testing

Unit reference number: K/600/5982

QCF level: 4

Credit value: 9

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for leading the process of hypothesis testing. It involves directing the calculation of the correct sample size to ensure the statistical validity of the hypothesis test and leading the production of a suitable sampling plan to reduce systematic errors. The tests should be conducted on a variable/process in a Six Sigma project where the actual statistics from data collected is compared with the calculated statistics so that a decision can be reached as to which hypothesis is true. Typically, tests that can be carried out could be F-Test, Chi-Square test, normality tests, T-test, Levene's test, Bartlett's test, contingency table and one-way ANOVA. The learner will be required to lead the production and approval of a hypothesis test report on the variable/process studied.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Specific unit requirements:

The word lead is used throughout this unit. This means that although the outcomes of this unit may be carried out and achieved as part of a team, it is necessary for the learner to demonstrate a level of overriding management and direction of the activities as a whole. This may be in the form of coordinating multiple activities, using company strategies and objectives to determine activity focus and managing projects involving improvement initiatives. The learner will have a leading role in controlling activity focus and planning.

Specific quantifiable and auditable personal contributions in the achievement of this unit are also required to fulfil this unit.

Competence in all the areas covered by the standard is required.

The learner's ability to combine the performance statements specified when applying the principles and processes of this unit must be demonstrated.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Lead the process of hypothesis testing	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 lead the activities within their area of responsibility to include all of the following: • set out and communicate the purpose of the improvement activities • involve the team in planning how the improvement activity will be achieved • ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective • provide advice and support the team to achieve both team and individual improvement objectives • motivate the team to present their own improvement ideas • encourage the team and/or individuals to take the lead where appropriate • agree the implementation of the improvement ideas			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	- negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate) - monitor the progress of improvement activities - deal with any organisational problems identified during the improvement activity 1.3 direct the utilization of sample size selection to ensure the statistical validity of an hypothesis test and check the calculation for the correct sample size required for the test 1.4 lead the production of a suitable sampling plan to reduce systematic errors 1.5 lead the conducting of a hypothesis test on a variable/process in a Six Sigma project			
1b Lead the process of hypothesis testing (continued)	1.6 obtain and confirm the actual statistic from data collected 1.7 confirm the correct statistic from one of the following: - F-test - Chi-Square test - normality tests - T-test - Levene's test			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	• Bartlett's test • contingency table • one way ANOVA 1.8 confirm for a hypothesis test: • the Delta/Sigma ratio • the Alpha risk • the Beta risk 1.9 use the appropriate test to compare the calculated statistic against actual statistic and confirm which hypothesis is true 1.10 confirm the following: • null hypothesis • alternative hypothesis • test statistic 1.11 lead the production of and approve a hypothesis test report on the variable/process studied			
2a Know how to lead the process of hypothesis testing	2.1 explain what hypothesis testing is, why we need to use hypothesis testing and how this benefits a Six Sigma improvement project 2.2 explain how to plan the resources and time needed to carry out the agreed activity			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.3 explain why we need to identify a suitable sample size 2.4 explain how to calculate a suitable sample size 2.5 explain what is meant by Alpha risk, Beta risk and Delta/Sigma ratio 2.6 explain what is meant by practical difference and statistical difference 2.7 explain how to conduct a hypothesis test			
2b Know how to lead the process of hypothesis testing (continued)	2.8 explain how to calculate test statistics such as mean, median, mode, standard deviation, range and variance 2.9 explain what a population and a sample are 2.10 explain what is meant by the null hypothesis 2.11 explain what is meant by the alternate hypothesis 2.12 explain how to determine the correct statistic from the following: F-test, Chi-Square test, normality tests, T-test, Levene's test, Bartlett's test, contingency tables and one way ANOVA 2.13 describe the extent of their own authority within the project and whom they should report to, in the event of problems that they cannot resolve			

Learner name:	_____	Date:	_____
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Assessor signature:	_____	Date:	_____
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(if sampled)			

Unit 33: Carrying out evolutionary operations (EVOP)

Unit reference number: R/600/5989

QCF level: 4

Credit value: 9

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for carrying out evolutionary operations (EVOP). It involves applying the principles and processes of EVOP to the selected process over a period of time whilst the plant/process is still in production. The learner will need to calculate the correct sample size required and identify a suitable sampling plan to reduce systematic errors. The learner will be expected to determine the scope/parameters of the experiment and carry out the experiment within these parameters, utilising the appropriate tools and techniques. The results of the EVOP will be recorded and analysed to identify areas where improvements to the process can be made. The learner will also need to produce a report of the findings along with an action plan to ensure the improvements identified are implemented.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Carry out evolutionary operations (EVOP)	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 select an appropriate process on which to carry out the evolutionary operations and obtain all the necessary data 1.3 determine the scope/parameters of the experiment 1.4 utilise sample size selection to ensure the statistical validity of the experiment and calculate the correct sample size for an experiment 1.5 estimate the resources and expected benefits for the evolutionary operations undertaken 1.6 document the resources required to include: • financial • timescales • manpower • plant/equipment • materials			
1b Carry out evolutionary operations (EVOP) (continued)	1.7 identify a suitable sampling plan to reduce systematic errors			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.8 run an evolutionary operation experiment using appropriate tools and techniques, recording and analysing the data collected 1.9 identify for the experiment undertaken: • a suitable alpha risk level • a suitable delta that needs to be observed • a suitable beta level 1.10 determine the correct experimental design to use from one of the following: • full factorial • 2k factorial • fractional factorial 1.11 contribute to the construction of an evolutionary operations board 1.12 calculate and produce graphs for the following: • main effects • interactions 1.13 identify suitable optimal conditions and produce an evolutionary operations report, highlighting the findings and including an action plan to ensure the improvements are implemented			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
2a Know how to carry out evolutionary operations (EVOP)	2.1 describe the advantages and disadvantages to using evolutionary operations (EVOP) 2.2 explain what is meant by a cycle and a phase 2.3 explain how to gather the data during an evolutionary operations activity 2.4 explain why we should use evolutionary operations in an improvement activity 2.5 describe evolutionary operation experimental design and how it is used in a Six Sigma improvement project 2.6 explain how and when evolutionary operations should be re-run and why 2.7 explain what statistics should be calculated in applying evolutionary operations 2.8 describe the measurements of central tendency and variation and how they are calculated			
2b Know how to carry out evolutionary operations (EVOP) (continued)	2.9 describe sample size selection to ensure the statistical validity of an experiment 2.10 describe Delta/Sigma ratio, Alpha and Beta risk for experiments 2.11 explain how to create an evolutionary operations board 2.12 explain how to carry out cost and benefit analysis within evolutionary operations			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.13 explain how to conduct full factorial, 2k factorial and fractional factorial experiments			
	2.14 explain how to calculate and produce graphs for main effects and interactions			
	2.15 explain how to identify suitable optimal conditions, and how to create an action plan to ensure these conditions are implemented			
	2.16 describe the extent of their own authority within the activity and whom they should report to, in the event of problems that they cannot resolve			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

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Internal verifier signature: _____ Date: _____
(if sampled)

Unit 34: Applying central limit theorem and confidence intervals

Unit reference number: K/600/6002

QCF level: 4

Credit value: 9

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for applying central limit theorem and confidence intervals to a project. It involves demonstrating how central limit theorem can be utilised to estimate the mean of a population when it is not normally distributed. The learner will be required to calculate confidence intervals from the standard confidence interval equations, which will include mean, standard deviation, Cp, and Cpk. The learner will be expected to demonstrate how sample size affects the accuracy of the mean. The learner will also be expected to produce a report highlighting the findings and an action plan identifying how the improvements can be implemented.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Apply central limit theorem and confidence intervals	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 demonstrate how central limit theorem can be utilised to estimate the mean of a population when it is not normally distributed 1.3 utilise the central limit theorem to: • transform non-normal data into normal data • increase the accuracy of measurement systems • calculate the standard error of the mean for a set of data • utilise central limit theorem to give an appropriate sample size for a test or inspection 1.4 calculate confidence intervals from the standard confidence interval equations			
1b Apply central limit theorem and confidence intervals (continued)	1.5 calculate confidence intervals for the following: • mean • standard deviation • Cp • Cpk 1.6 demonstrate how sample size affects the accuracy of the mean			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.7 produce a report highlighting the findings and include an action plan to ensure the improvements are implemented			
2a Know how to apply central limit theorem and confidence intervals	2.1 describe the health and safety requirements of the area in which they are carrying out an experiment			
	2.2 explain what the central limit theorem is			
	2.3 explain what is meant by the standard error of the mean			
	2.4 explain how the central limit theorem can be used to reduce measurement error			
	2.5 describe the number of observations that must be made in order to estimate a population mean when the data is not normally distributed			
	2.6 explain how to calculate the standard error of the mean			
2b Know how to apply central limit theorem and confidence intervals (continued)	2.7 describe the relationship between the standard error of the means and sample size			
	2.8 explain how to utilise central limit theorem to reduce measurement system error			
	2.9 explain how to calculate mean, median, mode, standard deviation, range, variance, Cp and Cpk			
	2.10 explain how to calculate confidence intervals from the standard confidence interval equations			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.11 describe the 'mean of means' principle			
	2.12 describe the extent of their own authority within the activity and whom they should report to, in the event of problems that they cannot resolve			

Learner name: _____ Date: _____
 Learner signature: _____ Date: _____
 Assessor signature: _____ Date: _____
 Internal verifier signature: _____ Date: _____
(if sampled)

Unit 35: Producing Taguchi linear graphs

Unit reference number: H/600/6029

QCF level: 4

Credit value: 9

Guided learning hours: 25

Unit summary

This unit covers the skills and knowledge needed to prove the competences required for producing Taguchi linear graphs. It involves utilising sample size selection to ensure the statistical validity of the experiment and calculating the correct sample size for the experiment. The learner will need to produce and use suitable sampling plans to reduce systematic errors and estimate the resources and expected benefits from carrying out the Taguchi linear graph activity. The learner will need to choose the appropriate Taguchi linear graph to use and calculate the factor settings for the Taguchi linear graph experiment. Having gathered all the necessary information and completed the appropriate calculations they will need to run an experiment and analyse the data collected for main effects and interactions. The learner will be required to identify suitable optimum conditions and produce a report of the activities, which includes an action plan identifying how the improvements can be implemented.

Assessment requirements/evidence requirements

This unit must be assessed in a work environment and must be assessed in accordance with the 'Semta Assessment Strategy'. Detailed information is given in *Annexe E*.

Assessment recording

Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
1a Produce Taguchi linear graphs	1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 utilise sample size selection to ensure the statistical validity of the experiment and calculate the correct sample size for the experiment 1.3 identify suitable sampling plans to reduce systematic errors 1.4 estimate the resources and expected benefits from the Taguchi linear graph activity and gain approval 1.5 document the resources required to include: • financial • timescales • manpower • plant/equipment • materials 1.6 determine the correct Taguchi linear graph to use 1.7 calculate factor settings for the Taguchi linear graph experiment			
1b Produce Taguchi linear graphs (continued)	1.8 determine factors and levels for the design of experiment			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	1.9 determine for the Taguchi linear graph experiment: • a suitable Alpha risk level • a suitable Beta level • a suitable Delta that needs to be observed 1.10 run an experiment recording and analyse the data collected 1.11 identify suitable optimum conditions and create an action plan to ensure these conditions are implemented 1.12 complete a written Taguchi linear graph report 1.13 calculate and produce graphs for the following: • main effects • interactions			
2a Know how to produce Taguchi linear graphs	2.1 describe the health and safety requirements of the area in which they carry out a Taguchi linear graph experiment 2.2 explain what is meant by the following terms: fold over, confounded, alias 2.3 explain how to produce Taguchi linear graph designs for a range of arrays (such as L4, L8 and L16) 2.4 explain what is meant by Alpha risk and Beta risk			

Learning outcomes	Assessment criteria	Evidence type	Portfolio reference	Date
	2.5 explain what a population and a sample are 2.6 explain how to calculate a suitable sample size 2.7 explain why we need to use Taguchi linear graph experimental design and how it is used in a Six Sigma improvement project			
2b Know how to produce Taguchi linear graphs (continued)	2.8 explain how to conduct a Taguchi linear graph experiment 2.9 explain how to calculate mean, median, mode, standard deviation, range and variance 2.10 explain how to calculate and graphically display main effects and interactions 2.11 explain how to identify suitable optimal conditions 2.12 explain how to create an action plan to ensure that improvements are implemented 2.13 explain how to create a Taguchi linear graph report, and the information it should contain 2.14 describe the extent of their own authority and whom they should report to, in the event of problems that they cannot resolve			

Learner name:	_____	Date:	_____
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Further information

Our customer service numbers are:

BTEC and NVQ	0844 576 0026
GCSE	0844 576 0027
GCE	0844 576 0025
The Diploma	0844 576 0028
DiDA and other qualifications	0844 576 0031

Calls may be recorded for training purposes.

Useful publications

Related information and publications include:

- *Centre Handbook for Edexcel QCF NVQs and Competence-based Qualifications* published annually
- functional skills publications – specifications, tutor support materials and question papers
- *Regulatory Arrangements for the Qualification and Credit Framework* (published by Ofqual, August 2008)
- the current Edexcel publications catalogue and update catalogue.

Edexcel publications concerning the Quality Assurance System and the internal and standards verification of vocationally related programmes can be found on the Edexcel website.

NB: Some of our publications are priced. There is also a charge for postage and packing. Please check the cost when you order.

How to obtain National Occupational Standards

Please contact:

Semta (Head Office)
14 Upton Road
Watford
WD18 0JT

Telephone: 01923 238441
Fax: 01923 256086
Email: customerservices@semta.org.uk

Professional development and training

Edexcel supports UK and international customers with training related to NVQ and BTEC qualifications. This support is available through a choice of training options offered in our published training directory or through customised training at your centre.

The support we offer focuses on a range of issues including:

- planning for the delivery of a new programme
- planning for assessment and grading
- developing effective assignments
- building your team and teamwork skills
- developing student-centred learning and teaching approaches
- building functional skills into your programme
- building effective and efficient quality assurance systems.

The national programme of training we offer can be viewed on our website (www.edexcel.com/training). You can request customised training through the website or by contacting one of our advisers in the Training from Edexcel team via Customer Services to discuss your training needs.

The training we provide:

- is active
- is designed to be supportive and thought provoking
- builds on best practice
- may be suitable for those seeking evidence for their continuing professional development.

Annexe A: Progression pathways

The Edexcel qualification framework for the engineering sector

Level	General qualifications	Diplomas	BTEC vocationally-related qualifications	BTEC specialist qualification / professional	NVQ / competence
8					
7					
6					We have too many qualifications to list in this space. Please refer to www.edexcel.com for further information.

Level	General qualifications	Diplomas	BTEC vocationally-related qualifications	BTEC specialist qualification / professional	NVQ/competence
5			Edexcel BTEC Level 5 HND Diploma in Manufacturing Engineering Edexcel BTEC Level 5 HND Diploma in Mechanical Engineering Edexcel BTEC Level 5 HND Diploma in Operations Engineering Edexcel BTEC Level 5 HND Diploma in Electrical/Electronic Engineering Edexcel BTEC Level 5 HND Diploma in General Engineering Edexcel BTEC Level 5 HND Diploma in Automotive Engineering Edexcel BTEC Level 5 HND Diploma in Aeronautical Engineering		We have too many qualifications to list in this space. Please refer to www.edexcel.com for further information.

Level	General qualifications	Diplomas	BTEC vocationally-related qualifications	BTEC specialist qualification / professional	NVQ/competence
4			Edexcel BTEC Level 4 HNC Diploma in Manufacturing Engineering Edexcel BTEC Level 4 HNC Diploma in Mechanical Engineering Edexcel BTEC Level 4 HNC Diploma in Operations Engineering Edexcel BTEC Level 4 HNC Diploma in Electrical/Electronic Engineering Edexcel BTEC Level 4 HNC Diploma in General Engineering Edexcel BTEC Level 4 HNC Diploma in Automotive Engineering Edexcel BTEC Level 4 HNC Diploma in Aeronautical Engineering		We have too many qualifications to list in this space. Please refer to www.edexcel.com for further information.

Level	General qualifications	Diplomas	BTEC vocationally-related qualifications	BTEC specialist qualification / professional	NVQ/competence
3		Edexcel Level 3 Diploma in Engineering	Edexcel Level 3 BTEC Certificate, Subsidiary Diploma, Diploma and Extended Diploma in Engineering Edexcel Level 3 BTEC Diploma and Extended Diploma in Mechanical Engineering Edexcel Level 3 BTEC Diploma and Extended Diploma in Manufacturing Engineering Edexcel Level 3 BTEC Diploma and Extended Diploma in Operations and Maintenance Engineering Edexcel Level 3 BTEC Diploma and Extended Diploma in Electrical/Electronic Engineering Edexcel Level 3 BTEC Diploma and Extended Diploma in Aeronautical Engineering		We have too many qualifications to list in this space. Please refer to www.edexcel.com for further information.

Level	General qualifications	Diplomas	BTEC vocationally-related qualifications	BTEC specialist qualification / professional	NVQ / competence
2	GCSE Engineering GCSE Manufacturing	Edexcel Level 2 Diploma in Engineering	Edexcel Level 2 BTEC Certificate, Extended Certificate and Diploma in Engineering		We have too many qualifications to list in this space. Please refer to www.edexcel.com for further information.
1		Edexcel Level 1 Diploma in Engineering	Edexcel BTEC Level 1 Award, Certificate and Diploma in Engineering		We have too many qualifications to list in this space. Please refer to www.edexcel.com for further information.
Entry					

Annexe B: Quality assurance

Key principles of quality assurance

- A centre delivering Edexcel qualifications must be an Edexcel recognised centre and must have approval for qualifications that it is offering.
- The centre agrees as part of gaining recognition to abide by specific terms and conditions around the effective delivery and quality assurance of assessment; the centre must abide by these conditions throughout the period of delivery.
- Edexcel makes available to approved centres a range of materials and opportunities to exemplify the processes required for effective assessment and provide examples of effective standards. Approved centres must use the guidance on assessment to ensure that staff who are delivering Edexcel qualifications are applying consistent standards.
- An approved centre must follow agreed protocols for: standardisation of assessors; planning, monitoring and recording of assessment processes; internal verification and recording of internal verification processes; and for dealing with special circumstances, appeals and malpractice.

Quality assurance processes

The approach to quality assured assessment is made through a partnership between a recognised centre and Edexcel. Edexcel is committed to ensuring that it follows best practice and employs appropriate technology to support quality assurance processes where practicable. Therefore, the specific arrangements for working with centres will vary. Edexcel seeks to ensure that the quality assurance processes that it uses do not place undue bureaucratic processes on centres and works to support centres in providing robust quality assurance processes.

The learning outcomes and assessment criteria in each unit within this specification set out the standard to be achieved by each learner in order to gain the qualification. Edexcel operates a quality assurance process, which is designed to ensure that these standards are maintained by all assessors and verifiers.

For the purposes of quality assurance, all individual qualifications and units are considered as a whole. Centres offering these qualifications must be committed to ensuring the quality of the units and qualifications they offer, through effective standardisation of assessors and internal verification of assessor decisions. Centre quality assurance and assessment processes are monitored by Edexcel.

The Edexcel quality assurance processes will involve:

- gaining centre recognition and qualification approval if a centre is not currently approved to offer Edexcel qualifications
- annual visits to centres by Edexcel for quality review and development of overarching processes and quality standards. Quality review and development visits will be conducted by an Edexcel quality development reviewer
- annual visits by occupationally competent and qualified Edexcel Standards Verifiers for sampling of internal verification and assessor decisions for the occupational sector
- the provision of support, advice and guidance towards the achievement of National Occupational Standards.

Centres are required to declare their commitment to ensuring quality and appropriate opportunities for learners that lead to valid and accurate assessment outcomes. In addition, centres will commit to undertaking defined training and online standardisation activities.

Annexe C: Centre certification and registration

Edexcel Standards Verifiers will provide support, advice and guidance to centres to achieve Direct Claims Status (DCS). Edexcel will maintain the integrity of Edexcel QCF NVQs through ensuring that the awarding of these qualifications is secure. Where there are quality issues identified in the delivery of programmes, Edexcel will exercise the right to:

- direct centres to take actions
- limit or suspend certification
- suspend registration.

The approach of Edexcel in such circumstances is to work with the centre to overcome the problems identified. If additional training is required, Edexcel will aim to secure the appropriate expertise to provide this.

What are the access arrangements and special considerations for the qualification in this specification?

Centres are required to recruit learners to Edexcel qualifications with integrity.

Appropriate steps should be taken to assess each applicant's potential and a professional judgement made about their ability to successfully complete the programme of study and achieve the qualification. This assessment will need to take account of the support available to the learner within the centre during their programme of study and any specific support that might be necessary to allow the learner to access the assessment for the qualification. Centres should consult Edexcel's policy on learners with particular requirements.

Edexcel's policy on access arrangements and special considerations for Edexcel qualifications aims to enhance access to the qualifications for learners with disabilities and other difficulties (as defined by the 1995 Disability Discrimination Act and the amendments to the Act) without compromising the assessment of skills, knowledge, understanding or competence. Please refer to *Access Arrangements and Special Considerations for BTEC and Edexcel NVQ Qualifications* for further details. www.edexcel.com.

Annexe D: Additional Requirements for qualifications that use the title NVQ within the QCF

Contents

Edexcel Level 4 NVQ Diploma in Business-Improvement Techniques (QCF)	1
For first registration November 2010	1
Contents	3
Contents	287
Contents	297
Edexcel Level 4 NVQ Diploma in Business-Improvement Techniques (QCF)	1
For first registration November 2010	1
Contents	3
Contents	287
Contents	297

Purpose of document

- 1 The purpose of this document is to make clear what additional requirements are needed to assess and quality assure qualifications that use the title NVQ within the QCF.
- 2 When an SSC/SSB and awarding organisation wants to use the title NVQ in the naming of a qualification within the QCF, the awarding organisation is required to make sure this qualification is assessed and quality assured in accordance with these additional requirements and other requirements described in the SSC/SSB Assessment Strategy.
- 3 The aims of these additional requirements are to:
 - ensure that all competence based qualifications that use the title NVQ within the QCF are:
 - assessed consistently
 - quality assured consistently
 - maintain the integrity of qualifications that use the title NVQ within the QCF
 - establish the NVQ brand within the QCF
 - keep bureaucracy associated with assessment and quality assurance of qualifications that use the title NVQ within the QCF to a minimum.

Background

- 4 "At the heart of an NVQ is the concept of occupational competence; the ability to perform to the standards required in employment across a range of circumstances and to meet changing demands. NVQs are first and foremost about what people can do. They go beyond technical skills to include planning, problem solving, dealing with unexpected occurrences, working with other people and applying the knowledge and understanding that underpins overall competence".¹
- 5 NVQs are based entirely on National Occupational Standards (NOS) developed by an SSC/SSB, which describe the competence needed in an occupational role.
- 6 Qualifications that use the title NVQ within the QCF must comply with the rules of combination determined by the SSC/SSB. Awarding organisations are not allowed to develop another qualification that does not use the title NVQ within the QCF, if it uses the same rules of combination as a qualification that does use the title NVQ within the QCF.
- 7 The QCF offers increased flexibility in the way occupational competence can be assessed and demonstrated. Qualifications that use the title NVQ in the title within the QCF are just one way of assessing and demonstrating occupational competence. SSCs/SSBs are free to work with their awarding organisations to agree what qualifications will be used to assess occupational competence. Qualifications that use the title NVQ within the QCF, are not a preferred method for assessing occupational competence and all qualifications accredited through the QCF have equal status.
- 8 When developing a qualification for the QCF, including qualifications that use the title NVQ within the QCF, an awarding organisation must be a recognised awarding organisation and must meet the Qualification Requirements in the Regulatory Arrangements for the Qualifications and Credit Framework, published by The Office of the Qualifications and Examinations Regulator (Ofqual) in August 2008.
- 9 The qualification regulators confirmed that a group of SSCs and SSBs would be free to develop specific, additional requirements about the way in which qualifications that use the title NVQ within the QCF will be assessed and quality assured. For those recognised awarding organisations that want to assess occupational competence through the use of qualifications that use the title NVQ within the QCF, it has been agreed by SSCs and SSBs that the following additional requirements must be met.

¹ NCVQ's NVQ Criteria and Guidance 1995.

Additional requirements for qualifications that use the title NVQ within the QCF

Introduction

- 10 Qualifications that use the title NVQ within the QCF must be assessed and quality assured in accordance with the following additional requirements.

Assessment Requirements

- 11 When a qualification uses the title NVQ within the QCF, awarding organisations are required to make sure their recognised assessment centres understand how learners are to be assessed.
- 12 Assessment methodologies must meet the assessment strategy developed in partnership between the relevant SSC or SSB and awarding organisations for the qualification. The assessment strategy must be published and made available separately and will include the requirements for assessment of qualifications that use the title NVQ within the QCF. The assessment criteria for each unit will be part of the units that make up the qualification.
- 13 Learners must complete real work activities in order to produce evidence to demonstrate they have met the NOS and are occupationally competent.
- 14 When a learner cannot complete a real work activity, simulation is allowed.
- 15 Simulation is allowed when:
 - a learner is required to complete a work activity that does not occur on a regular basis and therefore opportunities to complete a particular work activity do not easily arise
 - a learner is required to respond to a situation that rarely occurs, such as responding to an emergency situation
 - the safety of a learner, other individuals and/or resources will be put at risk.
- 16 When simulation is used, assessors must be confident that the simulation replicates the workplace to such an extent that learners will be able to fully transfer their occupational competence to the workplace and real situations.
- 17 Units that must not be assessed by simulation must be identified by the SSC/SSB in the assessment strategy for the qualification or family of qualifications.
- 18 Learners must be assessed by assessors:
 - who are occupationally competent in the occupational areas they are assessing where they have sufficient and relevant technical/occupational competence in the unit, at or above the level

of the unit being assessed and as defined by the assessment strategy for that qualification

- who must hold or be working towards a suitable assessor qualification² to confirm they understand assessment and how to assess learners
- must be fully conversant with the unit(s) against which the assessments and verification are to be undertaken.

- 19 All assessors must carry out assessment to the standards specified in the A units.
- 20 All assessment decisions made by a trainee assessor must be checked by a qualified assessor or an assessor recognised by an awarding organisation.
- 21 Trainee assessors must have a plan, which is overseen by the recognised assessment centre, to achieve the relevant assessor qualification(s) within an agreed timescale.

² Currently an assessor could hold unit A1 and/or unit A2. Or from the past unit D32 and/or unit D33. SSCs also identify other suitable equivalent qualifications.

Quality assurance requirements

- 22 When a qualification uses the title NVQ within the QCF, awarding organisations are required to make sure their recognised assessment centres understand how the qualification will be quality assured.
- 23 Qualifications that use the title NVQ within the QCF, must be verified:
- internally by an internal verifier, who is accountable to the assessment centre
 - externally by an external verifier, who is accountable to the awarding organisation or an agent of the awarding organisation.
- 24 With reference to internal verification, internal verifiers must:
- hold or be working towards a suitable internal verifier qualification³ to confirm they understand how to internally verify assessments
 - have sufficient and relevant technical/occupational familiarity in the unit(s) being verified
 - be fully conversant with the standards and assessment criteria in the units to be assessed
 - understand the awarding organisation's quality assurance systems and requirements for this qualification.
- 25 Trainee internal verifiers must have a plan, which is overseen by the recognised assessment centre, to achieve the internal verifier qualification within an agreed timescale.
- 26 With reference to external verification, external verifiers must:
- hold or be working towards a suitable external verification qualification⁴ to confirm they understand and are able to carry out external verification
 - have no connections with the assessment centre, in order to maintain objectivity
 - have sufficient and relevant technical/occupational understanding in the unit(s) being verified
 - be fully conversant with the standards and performance criteria in the units to be assessed
 - understand the awarding organisation's quality assurance systems for this qualification.
- 27 Trainee external verifiers must have a plan, which is overseen by the awarding organisation, to achieve the external verifier qualification within an agreed timescale.

³ Currently an internal verifier needs to hold unit V1. Or from the past unit D34. SSCs also identify other suitable equivalent qualifications.

⁴ Currently an external verifier needs to hold unit V2. Or from the past unit D35.

- 28 Awarding organisations must decide the frequency of external monitoring activities. Any decision must be based on
- the risks associated with a qualification that is designed to help a learner demonstrate occupational competence
 - an evaluation of the centre's performance and past record.
- 29 Awarding organisations will have in place suitably constituted audit processes, which are supported by naturally occurring quality assurance and monitoring systems that already exist in workplace assessment environments.



Semta

Engineering

NVQ Level 2, 3 and 4

QCF Unit Assessment Strategy

Version 1. 16th March 2010

Contents

Introduction	299
Assessor Requirements	300
Verifier Requirements	300
Technical Requirements for Assessors and Verifiers	301
Assessment Environment	302
Access to Assessment	303
Carrying Out Assessment	303
Performance Evidence Requirements	304
Assessing Knowledge and Understanding	304
Witness testimony	305
Quality Control of Assessment	305
Additional Notes	306

Introduction

SEMTA, the Sector Skills Council for the Science Engineering Manufacturing Technologies Sector, has produced this QCF Unit Assessment Strategy to:

- assist Assessors, Internal Verifiers and External Verifiers
- encourage and promote consistent assessment of NVQ units
- promote cost effective assessment plans.

This document also provides definitions for:

- the qualifications and experience required for Assessors and Verifiers
- the assessment environment and notes on simulation/replication
- access to units.

and requirements relating to:

- carrying out assessments
- performance evidence
- assessing knowledge and understanding.

The importance and value in which employers and learners place on undertaking NVQ units will provide a key measure of [Semta's] success with this unit assessment strategy. Another key success factor will be SEMTA's partnership with the relevant Awarding Organisations.

Assessor Requirements to Demonstrate Effective Assessment Practice

Assessment must be carried out by competent Assessors who hold, or are working towards, the nationally recognised Assessor units A1 and/or A2 as appropriate to the assessment being carried out. Assessors that hold units D32 and/or D33 must demonstrate that they are applying the assessment principles and practices set down in A1 and/or A2 as appropriate to the assessment being carried out.

Assessor Technical Requirements

Assessors must be able to demonstrate that they have verifiable, relevant and sufficient technical competence to evaluate and judge performance and knowledge evidence requirements as set out in the relevant QCF unit learning outcomes and associated assessment criteria.

This will be demonstrated either by holding a relevant technical qualification or by proven industrial experience of the technical areas to be assessed. The assessor's competence must, at the very least, be at the same level as that required of the learner(s) in the units being assessed.

Assessors must also be:

Fully conversant with the Awarding Organisation's assessment recording documentation used for the QCF NVQ units against which the assessments and verification are to be carried out, other relevant documentation and system and procedures to support the QA process.

Verifier Requirements

Internal Verifiers must hold, or be working towards, the nationally recognised Internal Verifier unit V1 and would be expected to be familiar with, and preferably hold, the nationally recognised Assessor units. Internal Verifiers that hold unit D34 must demonstrate that they are applying the verification principles and practices set down in V1.

External Verifiers must hold, or be working towards, the nationally recognised External Verifier unit V2 and would be expected to be familiar with, and preferably hold, the nationally recognised Assessor units, and Internal Verifier unit. External Verifiers that hold unit D35 must demonstrate that they are applying the verification principles and practices set down in V2.

Verifiers, both Internal and External, will also be expected to be fully conversant with the terminology used in the QCF NVQ units against which the assessments and verification are to be carried out, the appropriate Regulatory Body's systems and procedures and the relevant Awarding Organisation's documentation, systems and procedures within which the assessment and verification is taking place.

Specific technical requirements for internal and external verifiers

Internal and external verifiers of this qualification must be able to demonstrate that they have verifiable, sufficient and relevant industrial experience, and must have a working knowledge of the processes, techniques and procedures that are used in the relevant sector/occupation.

The tables on the following page show the recommended levels of technical competence for assessors, internal verifiers, and external verifiers.

Technical Requirements for Assessors and Verifiers

Position	Prime activity requirements	Support activity requirements	Technical requirements (see notes)
Assessor	Assessment Skills	IV Systems	Technical <i>competence</i> in the areas covered by the QCF units being assessed
Internal Verifier	Verification Skills	Assessment Knowledge	Technical <i>understanding</i> of the areas covered by the qualifications
External Verifier	Verification skills	Assessment Understanding	Technical <i>awareness</i> of the areas covered by the qualifications

Notes

- 1 Technical *competence* is defined here as a combination of practical skills, knowledge, and the ability to apply both of these, in familiar and new situations, within a real working environment.
- 2 Technical *understanding* is defined here as having a good understanding of the technical activities being assessed, together with knowledge of relevant Health & Safety implications and requirements of the assessments.
- 3 Technical *awareness* is defined here as a general overview of the subject area, sufficient to ensure that assessment and portfolio evidence are reliable, and that relevant Health and Safety requirements have been complied with.
4. The competence required by the assessor, internal verifier and external verifier, in the occupational area being assessed, is likely to exist at three levels as indicated by the shaded zones in the following table.

Technical Competence required by:	An ability to <i>discuss</i> the general principles of the competences being assessed	An ability to <i>describe</i> the practical aspects of the competence being assessed	An ability to <i>demonstrate</i> the practical competences being assessed
Assessor			
Internal Verifier			
External Verifier			

Assessment Environment

The evidence put forward for this unit can only be regarded valid, reliable, sufficient and authentic if achieved and obtained in the working environment and be clearly attributable to the learner. However, in certain circumstances, simulation/replication of work activities may be acceptable.

The use of high quality, realistic simulations/replication, which impose pressures which are consistent with workplace expectations, should only be used in relation to the assessment of the following:

- rare or dangerous occurrences, such as those associated with health, safety and the environment issues, emergency scenarios and rare operations at work
- the response to faults and problems for which no opportunity has presented for the use of naturally occurring workplace evidence of learners competence
- aspects of working relationships and communications for which no opportunity has presented for the use of naturally occurring workplace evidence of learners competence.

Simulations/replications will require prior approval from the specific Awarding Organisation and should be designed in relation to the following parameters:

- the environment in which simulations take place must be designed to match the characteristics of the working environment
- competencies achieved via simulation/replication must be transferable to the working environment
- simulations which are designed to assess competence in dealing with emergencies, accidents and incidents must be verified as complying with relevant health, safety and environmental legislation by a competent health and safety/environmental control officer before being used
- simulated activities should place learners under the same pressures of time, access to resources and access to information as would be expected if the activity was real
- simulated activities should require learners to demonstrate their competence using plant and/or equipment used in the working environment

- simulated activities which require interaction with colleagues and contacts should require the learner to use the communication media that would be expected at the workplace
- for health and safety reason simulations need not involve the use of genuine substances/materials. Any simulations which require the learner to handle or otherwise deal with materials substances/should ensure that the substitute take the same form as in the workplace.

Access to Assessment

There are no entry qualifications or age limits required by learners to undertake the NVQ units unless this is a legal requirement of the process or the environment. Assessment is open to any learner who has the potential to achieve the assessment criteria set out in the units.

Aids or appliances, which are designed to alleviate disability, may be used during assessment, providing they do not compromise the standard required.

Carrying Out Assessment

The NVQ units were specifically developed to cover a wide range of activities. The evidence produced for the units will, therefore, depend on the learners choice of "bulleted items" listed in the unit assessment criteria.

Where the assessment criteria gives a choice of bulleted items (for example 'any three from five'), assessors should note that learners do not need to provide evidence of the other items to complete the unit (in this example, two) items, particularly where these additional items may relate to other activities or methods that are not part of the learners normal workplace activity or area of expertise.

Performance Evidence Requirements

Performance evidence must be the main form of evidence gathered. In order to demonstrate consistent, competent performance for a unit, a minimum of 3 different examples of performance must be provided, and must be sufficient to show that the assessment criteria have been achieved to the prescribed standards. It is possible that some of the bulleted items in the assessment criteria may be covered more than once. The assessor and learner need to devise an assessment plan to ensure that performance evidence is sufficient to cover all the specified assessment criteria and which maximises the opportunities to gather evidence. Where applicable, performance evidence may be used for more than one unit.

The most effective way of assessing competence, is through direct observation of the learner. Assessors must make sure that the evidence provided reflects the learner's competence and not just the achievement of a training programme.

Evidence that has been produced from team activities, for example, maintenance or installation activities is only valid when it clearly relates to the learners specific and individual contribution to the activity, and not to the general outcome(s).

Each example of performance evidence will often contain features that apply to more than one unit, and can be used as evidence in any unit where appropriate.

Performance evidence must be a combination of:

- outputs of the learner's work, such as items that have been manufactured, installed, maintained, designed, planned or quality assured, and documents produced as part of a work activity.

together with:

- evidence of the way the learner carried out the activities such as witness testimonies, assessor observations or authenticated learner reports, records or photographs of the work/activity carried out, etc.

Competent performance is more than just carrying out a series of individual set tasks. Many of the units contain statements that require the learner to provide evidence that proves they are capable of combining the various features and techniques. Where this is the case, separate fragments of evidence would not provide this combination of features and techniques and will not, therefore, be acceptable as demonstrating competent performance.

If there is any doubt as to what constitutes valid, authentic and reliable evidence, the internal and/or external verifier should be consulted.

Assessing knowledge and understanding

Knowledge and understanding are key components of competent performance, but it is unlikely that performance evidence alone will provide enough evidence in this area. Where the learners knowledge and understanding (and the handling of contingency situations) is not apparent from performance evidence, it must be assessed by other means and be supported by suitable evidence.

Knowledge and understanding can be demonstrated in a number of different ways. Semta expects oral questioning and practical demonstrations to be used, as these are considered the most appropriate for these units.

Assessors should ask enough questions to make sure that the learner has an appropriate level of knowledge and understanding, as required by the unit. Awarding Organisations may choose other methods, which must be supported by a suitable rationale.

Evidence of knowledge and understanding will **not** be required for those bulleted items in the assessment criteria that have not been selected by the learner.

The achievement of the specific knowledge and understanding requirements of the units cannot simply be inferred by the results of tests or assignments from other units, qualifications or training programmes. Where evidence is submitted from these sources, the assessor must, as with any assessment, make sure the evidence is valid, reliable, authentic, directly attributable to the learner, and meets the full knowledge and understanding requirements of the unit.

Where oral questioning is used the assessor must retain a record of the questions asked, together with the learner's answers.

Awarding Organisations may choose other methods, which must be supported by a suitable rationale.

Witness testimony

Where observation is used to obtain performance evidence, this must be carried out against the unit assessment criteria. Best practice would require that such observation is carried out by a qualified Assessor. If this is not practicable, then alternative sources of evidence may be used.

For example, the observation may be carried out against the assessment criteria by someone else that is in close contact with the learner. This could be a team leader, supervisor, mentor or line manager who may be regarded as a suitable witness to the learners competency. However, the witness must be technically competent in the process or skills that they are providing testimony for, to at least the same level of expertise as that required of the learner. It will be the responsibility of the assessor to make sure that any witness testimonies accepted as evidence of the learner's competency are reliable, auditable and technically valid.

Quality Control of Assessment

General

There are two major points where an Awarding Organisation interacts with the Centre in relation to the External Quality Control of Assessment for a qualification and these are:

- Approval - when a Centre take on new qualifications, the Awarding Organisation, normally through an External Verifier (EV), ensures that the Centre is suitably equipped and prepared to deliver the new qualification
- Monitoring - throughout the ongoing delivery of the qualification the Awarding Organisation, through EV monitoring and other mechanisms must maintain and the quality and consistency of assessment of the qualification.

Approval

In granting Approval, the Awarding Organisation, normally through its External Verifiers (EV) must ensure that the prospective Centre:

- meets any procedural requirements specified by the Awarding Organisation
- has sufficient and appropriate physical and staff resources
- meets relevant health and safety and/or equality and access requirements
- has a robust plan for the delivery, assessment and QA for the qualifications.

Awarding Organisation's may decide to visit the Centre to view the evidence provided.

The Awarding Organisation must have a clear rationale for the method(s) deployed.

Monitoring

The Awarding Organisation, through EV monitoring and other mechanisms, must ensure:

- that a strategy is developed and deployed for the ongoing Awarding Organisation monitoring of the Centre. This strategy must be based on an active risk assessment of the Centre. In particular the strategy must identify the learner, assessor and IV sampling strategy to be deployed and the rationale behind this
- that the Centre's internal quality assurance processes are effective in learner assessment

- that sanctions are applied to a Centre where necessary and that corrective actions are taken by the Centre and monitored by the Awarding Organisation/EV
- that reviews of Awarding Organisation's external auditing arrangements are undertaken.

Awarding Organisations are required to provide to SEMTA, on request, details of the strategies, rationales and reviews detailed above.

Additional Notes:

It is recognised that some Awarding Organisations provide supplementary guidance and documentation to centres to support the quality of assessment and verification practice of N/SVQs.

Ofqual
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Llywodraeth Cynulliad Cymru
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For more information on Edexcel and BTEC qualifications please
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