GQA PAA\VQSET Level 5 Diploma in Meteorological Forecasting

603/2867/8

Centre Qualification Handbook

Competence-based Qualifications

AUGUST 2021 V1

GQA Qualifications
Unit 1, 12 O'clock Court, Sheffield, S4 7WW
info@gqaqualifications.com

CONTENTS PAGE

INTRODUCTION TO THE HANDBOOK

This qualification sits within the Regulated Qualifications Framework (RQF).

This Qualification Handbook has been developed to ensure that GQA Centres understand the requirements of the qualification. The Handbook contains the following information:

- Qualification Structure
- Assessment Requirements
- Assessment Methods
- Glossary
- Qualification Units

This Qualification Handbook has been developed to provide support in the implementation of the qualification as well as giving information to ensure that the assessment and quality assurance is consistent, robust and reliable within each centre and nationally. The handbook also contains details of the skills and/or knowledge the learner must obtain to achieve the units and qualification.

Qualification Structure

This section of the handbook summarises the content of the qualification and the skills and/or knowledge learners that achieve it can be expected to gain. It also outlines the units required to achieve the qualification and will give the learner an idea of how long the qualification will take to achieve through the Total Qualification Time (TQT) and how much contact time they can expect through the Guided Learning Hours (GLH). It also provides information about possible progression opportunities once the qualification has been achieved.

Assessment Requirements

The assessment requirements for the qualification will cover any specific information about how the qualification may be assessed, such as whether assessors require specific qualifications or occupational competence and whether simulation is permitted in the achievement process.

Assessment Methods

This section summarises the different assessment methods and types of evidence that support assessment; these may be used to demonstrate competence or the achievement of knowledge and understanding.

Qualification Units

The unit overview summarises the content of the unit and the skills and/or knowledge the learner will have gained on achievement of the unit. The units may also contain additional information in the assessment context which will describe the areas to be covered and any appropriate assessment guidance and evidence requirements which will outline additional assessment requirements and should be built into assessment plans and included on assessment records. The unit detail will also confirm whether simulation is permitted for that particular unit.

Qualification Assessment and Support Materials

Centres will be sent the following qualification assessment and support materials:

- Assessment Forms – it is not mandatory to use these forms. Centres may wish to use their own assessment documentation – these should be approved by the External Verifier prior to use.
- Declaration of Validation – must be included in all completed learner portfolios
- Learner Guide
- Qualification Handbook
- Registration Spreadsheet & Certification Claim Forms

LEVEL 5 DIPLOMA IN METEOROLOGICAL FORECASTING

Qualification Summary

This qualification will provide recognition of the skills and knowledge of individuals working in Meteorological Forecasting. It covers dealing with customers, monitoring the weather, preparing forecast data and weather forecasts, and communicating this information to others.

Total Qualification Time (TQT) and Guided Learning Hours (GLH)

Guided Learning Hours (GLH)

Guided Learning Hours are the time the learner is under the immediate supervision or guidance of a lecturer, supervisor, tutor or other appropriate provider or education or training.

The GLH for this qualification is 335

Total Qualification Time (TQT)

Total Qualification Time is comprised of 2 elements:

1. GLH
   plus
2. an estimate of the number of hours a learner will reasonably be likely to spend in preparation, study or any other form of participation in education or training, including assessment, which takes place as directed by (but not under the immediate supervision of) a lecturer, supervisor, tutor or other appropriate provider or education or training

The TQT for this qualification is 850

Achieving the Qualification

Learners must achieve 6 Mandatory Units.

Unit No.	Unit Name
Met 11b	Clarify customers' meteorological needs
Met 12b	Monitor the weather
Met 13b	Prepare meteorological forecast data
Met 14b	Prepare and issue weather forecasts in different formats
Met 15b	Control the quality of weather forecasts
Met 16b	Convey meteorological information and weather forecasts to users

Progression

This Diploma is part of a suite of qualifications developed from the Meteorology National Occupational Standards at Levels 3 to 6.

Further information can be found on the GQA website www.paa-uk.org or on the Register of Regulated Qualifications website http://register.ofqual.gov.uk

ASSESSMENT REQUIREMENTS

Assessors must ensure that, when assessing the skills, knowledge and/or understanding, the evidence produced by learners is:

- Valid – does evidence meet the requirements described in the unit?
- Authentic – has the learner produced the evidence?
- Current – has the evidence been produced recently and does it demonstrate current competence?
- Sufficient – is there enough evidence to demonstrate competence?

to enable reliable and consistent judgements to be made about the achievement of all the requirements of the unit(s) and qualification.

GQA Centres must ensure that people involved in the assessment process have the appropriate expertise and are adequately informed and supported to fulfil their responsibilities.

ASSESSMENT STRATEGY

Below is the information to support the assessment requirements of the qualification:

- Mandatory use of evidence from workplace performance
- Use of Simulation
- Occupational competence of assessors and verifiers

Mandatory use of evidence from workplace performance

a. Unless the use of simulation is expressly permitted within the qualification or unit specific evidence requirements, evidence must demonstrate the learner's competence in a real or realistic environment.

b. Knowledge and Understanding will be assessed via (pre-set and/or free form) questions, or by inference from performance, which cover three primary types of knowledge:

- Knowledge of facts and procedures
- Understanding of principles, concepts and underpinning procedures
- How to apply principles and procedures in specific contexts

All questions must be asked by the assessor at appropriate moments throughout the assessment process, preferably linked to observed activity and/or review of documentary evidence. The questions asked of, and answers provided by, the learner must be recorded.

Use of Simulation

c. The qualification or unit specific assessment requirements will define where evidence from simulation is acceptable, and in which contexts.

Simulation should be used only where direct evidence of learner performance cannot be obtained. Under these circumstances simulation may be used for summative assessment. Reasons for the use of simulation should be made clear to and agreed by the external verifier and should include the following details:

- which competence (and standards) the simulation was designed to assess;
- the kind of equipment, facilities and physical environment proposed for the simulation of performance. It is unlikely that the External Verifier will approve a simulation if it does not involve real plant and equipment;

- how the simulated activity relates to the learner's normal work context in terms of the pressures of time, access to resources and access to information, and the communication media; and
- how the simulation was set up and conducted, preferably supported by physical evidence such as photographs or inspection of a test rig.

Assessors, internal verifiers and external verifiers should monitor the proportion of evidence generated via simulations to ensure that it is not the primary source of a learner's claim to competence.

d. Under these circumstances simulations are reserved for aspects of competence illustrated by the following contexts:

- where demonstration of emergency shutdown and related safety procedures would be; **dangerous and/or disruptive** to plant/environment/individuals; **too costly** such as total plant shutdown or dealing with spillage of dangerous substances; where **issues of confidentiality** restrict access to real work opportunities;
- demonstrating specific aspects of the operation which rarely or never occur due to effective quality assurance systems;
- the capacity to integrate disparate knowledge to cope with unforeseen events and to solve problems; or
- aspects of working relationships and communications for which no opportunity has presented for the use of naturally occurring workplace evidence of learner performance.

e. Simulation must enable the individual to demonstrate competence in a real or realistic work environment. In this context this means in specialist centres which replicate the workplace in terms of equipment and environment, reflect normal working situations and use relevant industrial or commercial standards and procedures. Short work placements or non-realistic work environments which do not replicate the pressures and requirements of normal commercial or industrial activities will not be acceptable. The bulk of the learner's evidence should be drawn from their normal working activity and not consist of artificially contrived opportunities for one-off demonstration of competence. Similarly equipment must be that used in current commercial and industrial contexts. Procedures and standards used should be those which are nationally or internationally recognised or devised by specific companies as standard operating procedure.

f. Simulation must enable the individual to acquire his/her skills and knowledge in a realistic work environment. In this context this means in specialist centres which replicate the workplace in terms of equipment and environment, it reflects normal working situations and uses relevant industrial or commercial standards and procedures. Where possible providers should attempt to replicate the pressures and requirements of normal commercial or industrial activities. Equipment must be that used in current commercial and industrial contexts. Procedures and standards used should be those which are nationally or internationally recognised or devised by specific companies as standard operating procedure.

g. Circumstances outside of those listed in Section D above may also be considered suitable for the use of simulation with the agreement of the External Verifier and GQA. Under these circumstances simulation may be used for formative assessment only.

Occupational competence of Assessor and Verifiers

h. Assessors:

- must be competent in the units they are assessing. This is shown through the assessor having achieved the award they are assessing OR providing quality evidence to the external verifier that they are able to make valid judgements of the competence of learners. This could be done through a combination of a) personal interview, b) review of employment histories and/or c) examination of the assessor's judgement during assessments.
- must have a working knowledge of awards and a full understanding of that part of the award for which they have responsibility.
- should hold or be working towards suitable qualifications for assessment, as defined by GQA.

i. Internal verifiers:

- must be either working in the appropriate sector itself OR they must be able to demonstrate they possess practical and up-to-date knowledge of current working practices appropriate to the sector in which they are carrying out verification practices; and
- must be appointed by a GQA recognised centre
- must have a working knowledge of the awards they are internally verifying
- should hold or be working towards suitable qualifications for verification, as defined by PAA\VQ-SET.

ASSESSMENT METHODS AND TYPES OF EVIDENCE

The following section gives information on the different assessment methods/types of evidence that support assessment. The following assessment methods/types of evidence may be used to demonstrate competence or that the learner has achieved the required level of knowledge and understanding.

Observation of Performance

Observation allows the assessor to see learners carrying out their work activities. It will take place primarily in the workplace but can also be undertaken in a training scheme. Natural discussion should take place where possible during observation, allowing the assessor to ask questions relating to what they are observing at the time. Assessors must capture their observations either by a written report and/or other methods (e.g. video, audio recording).

Questioning

This method of assessment can be used to ensure that the learner has knowledge and understanding to support their skills. Questions can be used to check knowledge - these questions can either be verbal during or at the end of an observation, or they can be set in a written format in formal or informal conditions. As some units may focus entirely on learners' knowledge, assessors may encourage a variety of evidence to meet the requirements of the unit – use of verbal and/or written questions, learner statements and professional discussion (see below). Verbal questioning or professional discussion should be captured, either by written notes or audio recording.

Products

Work product evidence may be generated as a result of work activities undertaken by learners, and could include reports, letters, or records of work carried out.

Witness Statement or Testimony

A Witness Statement or Testimony is confirmation by others that the learner carried out an activity or series of activities relevant to the requirements of the unit. It could be written by the learner and signed by the witness to confirm that it did take place, or the witness may write the statement. Alternatively, the assessor could speak to the witness and record the discussion. The statement can then be used as evidence within an assessment.

There may be occasions when an Expert Witness may be required to contribute to the assessment process. GQA's definition of an Expert Witness is 'an experienced employee who works in partnership with the assessor, by observing the learner carrying out their duties and recording their observations in line with the assessment procedures'. It should be noted that while the Expert Witness makes a valued contribution to the assessment process, it is the assessor who makes the assessment decision.

Simulation

Simulations are a source of performance evidence showing how an activity is carried out. Simulations require careful planning to ensure that they reflect as near as possible "real life" conditions and the requirements of the qualification(s). As a result of this the costs to set up a simulation may be considerable. Simulations are likely to be used in the following situations:

- they occur infrequently (e.g. dealing with emergencies)
- they involve unusual working conditions (e.g. working in isolation, outside the workplace)
- the work is hazardous
- it is not cost effective

Any use of simulation should be discussed and agreed with the GQA External Verifier and approved prior to implementation.

Recognition of Prior Learning (RPL)

This is the process whereby credit is given to experienced individuals for their previous achievements. It requires careful mapping of the individual's experience to the unit(s) to ensure that it meets the requirements. This exercise must be referred to the External Verifier to ensure that all the evidence presented is acceptable.

Professional Discussion

A Professional Discussion gives the learner the opportunity to tell their assessor what they are doing and why they are doing it in a particular way. The discussion should be supported by appropriate evidence – an observation report, work product or witness testimony. Professional Discussions should be planned to give the learner the chance to prepare, and should be recorded.

Learner Statements

A Learner Statement is an account of an activity that took place, described by the learner. A detailed statement could demonstrate skill, and also provides evidence of knowledge and understanding. Learner statements should be authenticated by an appropriate person.

Photographs and use of other media

Photographs and use of other media, e.g. video and audio, can provide detail of work activities carried out and questioning. Photographs are more effective when used with supporting statements. Video and audio evidence should be effectively referenced to allow specific activities or questioning to be found easily. It is important to note that if photographs and other media are to be used, the learner and assessor should ensure that permission is gained from all people who may be involved.

GLOSSARY

Term	Definition
Access Arrangements	Arrangements that are approved in advance of an examination or assessment to allow achievement to be demonstrated by learners with a disability, special learning needs (including where the learner's first language is not English, Welsh or Irish) or to avoid unlawful discrimination
Appeal	The process through which an awarding organisation may be challenged on the outcome of an enquiry about results or, where appropriate, other procedural decisions affecting a centre or an individual learner
Assessment	The process of making judgements about the extent to which a learner's work meets the requirements of a unit, or any additional assessment requirements of a qualification
Assessor	A person who assesses a learner's work
Award of Qualifications	A certificate (electronic or paper-based) issued to an individual that recognises their achievement
Award	A qualification with a TQT value between 10 and 129
Awarding Organisation	A body recognised by the qualifications regulators to award qualifications
Centre	An organisation accountable to an awarding organisation for assessment arrangements leading to the award of qualifications
Centre Recognition	A process through which a centre wishing to offer an award or awards is confirmed as being able to maintain the required quality and consistency of assessment, and comply with other requirements of the awarding organisation
Certificate (1) for a Unit or Qualification	A record of attainment of a qualification issued by an awarding organisation
Certificate (2)	A qualification with a TQT value between 130 and 369
Credit	An award that may be made to a learner in recognition of the achievement of a unit or qualification
Credit Value	The number of credits that may be awarded to a learner for the successful achievement of a unit or qualification
Diploma	A qualification with a TQT value of 370 or above
Guided Learning Hours	The number of hours of teacher-supervised or directed study time required to teach a qualification or unit of a qualification
Learning Time	The amount of time a learner at the level of the unit is expected to take, on average, to complete the unit to the standard required
Level	An indication of the relative demand, complexity and/or depth of achievement, and/or the autonomy of the learner in demonstrating that achievement

Term	Definition
Mandatory Units	Units that must be achieved for the qualification to be awarded
National Occupational Standards (NOS)	Describe what a person needs to do, know and understand in a job to carry out the role in a consistent and competent way
Optional Unit	A unit that a learner may choose to complete to achieve the required number of units for award of the qualification
Pathway	A route to the achievement of a qualification that requires particular units to be achieved and is identified by an endorsement to a qualification title
Qualification	An award made to a Learner for the achievement of the required units or other components for that qualification
Qualification Level	An indication of the relative demand, complexity and/or depth of achievement, and/or the autonomy of the learner, represented by a qualification
Qualifications Regulators	Government-designated statutory organisations required to establish national standards for qualifications and secure consistent compliance with them
Recognition of Prior Learning (RPL)	A method of assessment that considers whether a learner can demonstrate that they can meet the assessment requirements for a unit through knowledge, understanding or skills they already possess and do not need to develop through a course of learning
Sector Skills Council	A body responsible for formulating and reviewing occupational standards for a specific sector across the UK, and for supporting the development of units and qualifications based on these standards. Each SSC is an employer-led, independent organisation and is licensed by government
Standardisation Of Assessment	A process to ensure that assessment leading to the award of qualifications is applied consistently by individuals, centres and awarding organisations
Unique Learner Number (ULN)	The unique number that is used to identify an individual learner
Unit	A component of a qualification

LEVEL 5 DIPLOMA IN METEOROLOGICAL FORECASTING

CONTENT OF THE QUALIFICATION

MANDATORY UNITS

UNIT MET 11B	**CLARIFY CUSTOMERS' METEOROLOGICAL NEEDS**
LEVEL	**4**
GUIDED LEARNING HOURS	**20**

Unit Overview

This unit identifies the activities the learner will need to undertake to research, establish and understand the needs of their customers. The learner will be required to identify and appreciate the impact of their forecast on their customer's business, ensuring that critical forecasts and data are prioritised correctly and the customer's timeframe is met.

Assessment Guidance and Evidence Requirements

Evidence Requirements

The learner should provide evidence to meet the requirements of the Assessment Criteria, and those aspects of the Assessment Context (described below) that are relevant to their workplace and work role.

The learner must generate evidence to show that they can clarify customer's meteorological needs over a sustained period. For this unit relevant evidence could include:

- Copies of service provision agreements, contracts, emails and correspondence between forecaster and customer determining needs
- Witness testimony by the learner's line manager
- Evidence of communication through face to face contact, electronic or telephone questionnaires determining customer needs and action to be taken during times of critical weather
- An explanation of the learner's customer's needs and sensitivities
- Evidence to demonstrate that the learner can produce a customer list for warnings
- Lists of customers and work and weather related dependencies with time requirements

For the Assessment Criteria relating to the learner's knowledge, different types of evidence and assessment methods could be used, for example learner statements, questioning and professional discussion which should be recorded for verification.

Assessment Guidance

- Simulation is acceptable for this unit only when it is not possible to generate evidence of a real activity being performed, but must be in line with the requirements of GQA.

Assessment Context

The following terms have a specific meaning in this unit:

Weather conditions: benign, hazardous

Hazardous weather conditions will occur in synoptic situations which lead to significant impact on customer's operations within the sphere of the learner's responsibility, and where relevant will lead to the learner

issuing a warning. Depending on the customers involved, these may include but not be limited to – frontal passage, low cloud and advection fog during warm sector, cumulonimbus and associated warnings during unstable conditions, radiation fog due to high pressure, significant winds, passage of an active trough, cold weather bringing frost, ice, snow and freezing precipitation, and scenarios where there are rapid fluctuations in low cloud and/or visibility.

Type of forecasts: routine; non-routine

Learning Outcome and Assessment Criteria

Learning outcomes **The learner will:**	**Assessment criteria** **The learner can:**
1. Identify the customers and determine the significance of the given forecasts	1.1. Identify the customers for the forecasts, and group them into appropriate categories 1.2. Rank the customers in their order of priority for different weather scenarios 1.3. Identify the decisions customers may make as a result of forecasts 1.4. Identify the possible consequences for the customers of inaccurate forecasts
2. Establish the meteorological sensitivities of the customers	2.1. Prioritise the weather elements that are critical to the decision making by each of the customers involved 2.2. Assess how variations in those weather elements could affect customers' decisions and identify critical values 2.3. Identify the timeframes in which customers have to make their decisions
3. Know how to clarify customers' meteorological needs	3.1. Explain why some customers might, on occasion, be a higher priority than others 3.2. Describe how the forecast will be used by the customer 3.3. Clarify what effect the weather has on customers' business 3.4. State how the needs of customers can be established 3.5. Explain why some weather elements will have greater significance for a customer than others 3.6. Explain how uncertainty in the forecast might affect customers' decision making 3.7. Define the different ways in which uncertainty in forecasts can be communicated to customers

UNIT MET 12B	**MONITOR THE WEATHER**
LEVEL	**5**
GUIDED LEARNING HOURS	**60**

Unit Overview

This unit describes the activities and understanding needed to demonstrate that the learner can review and monitor the weather at the start and throughout a shift. The learner will be required to manage competing priorities and identify areas of the weather that are evolving or are uncertain. The learner should be able to demonstrate that they are able to communicate any changes to the forecast and use organisational procedures to alert themselves and colleagues to emerging issues.

Assessment Guidance and Evidence Requirements

Evidence Requirements

The learner should provide evidence to meet the requirements of the Assessment Criteria, and those aspects of the Assessment Context (described below) that are relevant to their workplace and work role.

The learner must generate evidence to show that they can monitor the weather over a sustained period. For this unit relevant evidence could include:

- Showing how they monitor the weather during a forecast shift in benign weather and in hazardous weather
- Witness testimony by line managers or colleagues
- Analyses of charts showing comparisons between model outputs and real-time weather
- An explanation of any changes made in any given situation and any concerns they may have
- Comparisons of the previous shift's forecast and the forecast for the coming shift
- Observation of the learner completing handovers and updating users or colleagues

The learner will be expected to use a range of observations, charts, images, forecasts, guidance and warnings.

For the Assessment Criteria relating to the learner's knowledge, different types of evidence and assessment methods could be used, for example learner statements, questioning and professional discussion which should be recorded for verification.

Assessment Guidance

- The use of simulation is not acceptable in the assessment of this unit.

Assessment Context

The following terms have a specific meaning in this unit:

Weather conditions: benign, hazardous

Hazardous weather conditions will occur in synoptic situations which lead to significant impact on customer's operations within the sphere of the learner's responsibility, and where relevant will lead to the learner issuing a warning. Depending on the customers involved, these may include but not be limited to – frontal passage, low cloud and advection fog during warm sector, cumulonimbus and associated warnings during unstable conditions, radiation fog due to high pressure, significant winds, passage of an active trough, cold weather bringing frost, ice, snow and freezing precipitation, and scenarios where there are rapid fluctuations in low cloud and/or visibility.

Central guidance is the Chief Forecaster's guidance issued by the forecasting organisation.

Learning Outcome and Assessment Criteria

Learning outcomes **The learner will:**	**Assessment criteria** **The learner can:**
1. Review the weather at the start of a shift	1.1. Identify the likely critical areas of the forecast
	1.2. Diagnose relevant trends by reviewing the current and past weather using available technology
	1.3. Develop an overview of the ongoing weather situation by reviewing existing forecasts, warnings and guidance
2. Monitor weather data and revise the view of the meteorological situation throughout a shift	2.1. Review continuously current observations, charts and images to confirm or challenge previous interpretations
	2.2. React appropriately to significant information when interpreting data
	2.3. Identify and disregard spurious information when interpreting data
	2.4. Review new forecasts and guidance to maintain an overview of current interpretations
	2.5. Monitor forecast uncertainties and check the validity of forecast products
	2.6. Anticipate when forecast products may need amending or cancelling, reacting appropriately and in a timely manner
	2.7. Carry out appropriate communication and engagement with relevant operational colleagues and / or customers
3. Identify priorities during the forecasting shift	3.1. Prioritise data monitoring to suit the circumstances of the current meteorological situation and the main areas of uncertainty
	3.2. Prioritise forecasting of the different weather elements to suit the circumstances of the current meteorological situation and the main areas of uncertainty
	3.3. Prioritise their work production to suit the circumstances of the current meteorological situation and the main areas of uncertainty
4. Know how to monitor weather data and review the meteorological situation	4.1 Justify at the start of the shift the rationale for existing forecasts, guidance, forecast uncertainties and warnings
	4.2 State why it is important to update forecasts and guidance
	4.3 Justify the rationale behind why the forecast uncertainties and warnings have been revised when the forecast has changed
	4.4 Describe how to identify inconsistent or spurious data when monitoring the weather
	4.5 State the amendment criteria and procedures
5. Know how to identify priorities during the forecasting shift	5.1. Explain the reasons underlying the ordering of data monitoring priorities

5.2. Explain the reasons underlying the ordering of forecasting priorities

5.3. Explain the reasons underlying the ordering of work production priorities

5.4. Clarify the role of communication between forecasters in identifying priorities and reconciling inconsistencies

UNIT MET 13B	**PREPARE METEOROLOGICAL FORECAST DATA**
LEVEL	**5**
GUIDED LEARNING HOURS	**190**

Unit Overview

This unit describes the activities and understanding needed to demonstrate that the learner can prepare meteorological forecast data. The learner will need to be able to establish the meteorological situation, highlighting weather elements which are evolving using the relevant models and theories to demonstrate their understanding. The learner will be required to provide estimated values for each element, using appropriate technology and operating procedures, before validating their estimates against real time data and guidance information. Where necessary the learner will identify the level of uncertainty in their forecasts and recognise when they have values that are sufficiently precise to meet the needs of their customers.

Assessment Guidance and Evidence Requirements

Evidence Requirements

The learner should provide evidence to meet the requirements of the Assessment Criteria, and those aspects of the Assessment Context (described below) that are relevant to their workplace and work role.

The learner must generate evidence to show that they can prepare forecast data over a sustained period. For this unit relevant evidence could include:

- Showing how the learner works during the forecasting shift in benign and in hazardous weather
- Making a presentation on the current weather
- Analysed charts identifying features and relevant areas of weather
- Drawing comparisons of forecasts with model outputs
- Analysing tephigrams and explain the data they offer
- Giving severe weather warnings, with an explanation of how they meet the warning criteria
- Examples of how local topography and other factors can have an effect on the local weather
- Describing the processes taking place in the atmosphere using model output, synoptic charts and radar and satellite imagery
- Written work that describes how the learner derived the estimate for any parameter

For the Assessment Criteria relating to the learner's knowledge, different types of evidence and assessment methods could be used, for example learner statements, questioning and professional discussion which should be recorded for verification.

Assessment Guidance

- The use of simulation in this unit is only acceptable for AC4.2 when the situation of advising customers when forecast data cannot be delivered to schedule does not occur through the timeframe of the shifts that are being assessed.

Assessment Context

The following terms have a specific meaning in this unit:

Weather conditions: benign, hazardous
Hazardous weather conditions will occur in synoptic situations which lead to significant impact on customer's operations within the sphere of the learner's responsibility, and where relevant will lead to the learner

issuing a warning. Depending on the customers involved, these may include but not be limited to – frontal passage, low cloud and advection fog during warm sector, cumulonimbus and associated warnings during unstable conditions, radiation fog due to high pressure, significant winds, passage of an active trough, cold weather bringing frost, ice, snow and freezing precipitation, and scenarios where there are rapid fluctuations in low cloud and/or visibility.

Meteorological situations: local; regional; wider geographical area

Raw data: satellite imagery; earth-based radar; surface observations; upper-air observations

Derived data: Numerical Weather Prediction; central guidance; synoptic charts; other forecasts

Central guidance is the Chief Forecaster's guidance issued by the forecasting organisation

Estimation techniques: conceptual models, specialised models, statistical techniques, empirical techniques, local knowledge and direct application of physical laws

Other data: historical; climatological norms.

Learning Outcome and Assessment Criteria

Learning outcomes **The learner will:**	**Assessment criteria** **The learner can:**
1. Establish the meteorological situation	1.1. Identify the significant synoptic features that will affect the forecast 1.2. Identify the uncertainties in the current meteorological situation and how these uncertainties are likely to evolve 1.3. Distinguish which relevant weather elements are likely to vary, and when, where and how quickly change is likely to occur 1.4. Diagnose the view of the elements likely to change to take account of emerging weather patterns as the shift progresses 1.5. Demonstrate through the shift a logical forecast process following organisational procedures
2. Develop values for the meteorological parameters	2.1. Use central guidance and extract the key information 2.2. Select, and where appropriate, apply correctly, forecast methods that are: • suited to the elements in question • applicable given the available data • appropriate to the location • relevant in the prevailing weather • consistent with guidelines and related forecasts 2.3. Utilise local knowledge to add value to central guidance and/or automated products 2.4. Determine the spread of values that may occur for various weather elements 2.5. Identify the likelihood of customer thresholds being met, reacting appropriately and in a timely manner

3. Validate forecast meteorological parameters	3.1. Critically compare analysed real-time data against the central / Numerical Weather Prediction guidance output showing differences that affect their forecast 3.2. Logically resolve these differences and revise the values accordingly 3.3. Assess the implications of these differences for related weather elements and make suitable changes
4. Determine the values to be used for forecasts	4.1. Recognise when estimated values are sufficiently precise to meet the needs of the forecast, without seeking unnecessary precision 4.2. Advise customers if such values cannot be achieved with the time and resources available 4.3. Inform customers of the limitations of the forecasts
5. Know how to establish the meteorological situation	5.1. Describe the causes of the significant physical processes observed in the current meteorological situation 5.2. Explain how these physical processes are likely to cause the weather to evolve 5.3. Explain the reasons for any uncertainty in the current meteorological situation 5.4. Justify the theories and/or conceptual models that they have used to develop their understanding of the meteorological situation 5.5. Describe the limitations of those theories and/or conceptual models 5.6. Explain the effects of non-meteorological factors on the weather
6. Know how to estimate values for the meteorological parameters	6.1. Explain the importance of central guidance 6.2. Explain the basis and limitations of any Numerical Weather Prediction models that are being used 6.3. Describe the basic physical principles that underpin the relevant specialised models, statistical techniques and empirical techniques 6.4. Explain the limitations of the relevant specialised models, statistical techniques and empirical techniques 6.5. State how to estimate the probability of an event, and the meaning of that probability
7. Know how to validate forecast meteorological parameters	7.1. Describe how to choose information to validate the meteorological parameters and make comparisons 7.2. Explain the importance of examining historical data for interpreting the current meteorological situation 7.3. Describe how to judge whether Numerical Weather Prediction output can be used without modification 7.4. Describe how to adapt the view of the evolving weather situation to resolve any differences
8. Know how to determine the values to be used for forecasts	8.1. Justify how to determine whether values are sufficiently precise 8.2. Describe what would be required to generate greater precision

UNIT MET 14B	**PREPARE AND ISSUE WEATHER FORECASTS IN DIFFERENT FORMATS**
LEVEL	**4**
GUIDED LEARNING HOURS	**40**

Unit Overview

This unit describes the activities and understanding needed to demonstrate that the learner can prepare and issue textual weather forecasts, guidance, meteorological charts and images. The learner will be required to work within their organisation's procedures to meet the needs of their customers.

Assessment Guidance and Evidence Requirements

Evidence Requirements

The learner should provide evidence to meet the requirements of the Assessment Criteria, and those aspects of the Assessment Context (described below) that are relevant to their workplace and work role.

The learner must generate evidence to show that they can prepare weather forecasts in different formats over a sustained period. For this unit relevant evidence could include:

- Copies of the learner's scripts, TAFs, charts and images of their forecasts for customers with differing needs produced to time
- Observing the learner preparing graphics
- An explanation of how the learner prepared the forecast to meet customer needs and the differences in the different forecast formats
- Copies of the learner's PowerPoint presentation
- Feedback from customers

For the Assessment Criteria relating to the learner's knowledge, different types of evidence and assessment methods could be used, for example learner statements, questioning and professional discussion which should be recorded for verification.

Assessment Guidance

- The use of simulation is not acceptable in the assessment of this unit.

Assessment Context

The following terms have a specific meaning in this unit:

Textual Forecasts / Charts and images: free-form; pre-defined format

Images: static; animated

Customers' needs: informed customer; non-technical customer

Learning Outcome and Assessment Criteria

Learning outcomes **The learner will:**	**Assessment criteria** **The learner can:**
1. Prepare and issue forecast products and guidance	1.1. Ensure that the output is an accurate reflection of the meteorological situation 1.2. Structure the output logically, using an appropriate, relevant, clear and unambiguous format and language 1.3. Submit the output on time, in full
2. Know how to prepare forecast products and guidance	2.1. Summarise the strengths and limitations of the different types of output 2.2. Summarise any pre-defined output requirements 2.3. Explain the rationales for the rules governing the output

UNIT MET 15B **CONTROL THE QUALITY OF WEATHER FORECASTS**
LEVEL **5**
GUIDED LEARNING HOURS **10**

Unit Overview

This unit describes the activities and understanding needed to demonstrate that the learner can search for and detect errors and omissions in their forecasts using standard operating procedures. The learner will be required to correct any errors prior to transmission of their forecast, and then to review and correct their forecast as necessary once published in accordance with their organisation's policy. The learner will be required to review previous forecasts for Quality Assurance and continuous improvement purposes.

Assessment Guidance and Evidence Requirements

Evidence Requirements

The learner should provide evidence to meet the requirements of the Assessment Criteria, and those aspects of the Assessment Context (described below) that are relevant to their workplace and work role.

The learner must generate evidence to show that they can quality control and verify weather forecasts over a sustained period. For this unit relevant evidence could include:

- Quality control audits and records showing checks the learner has made and reviews they have carried out
- Reports for guidance or suspect data, reasons for the learner's request and what prompted them to question the data
- Making comparisons between model output and analysed real time data showing differences that affect the forecast
- Copies of the learner's contributions to local staff instructions relating to quality and verification
- An explanation of how the learner found errors and omissions and the action they took, specifically in the area of data failure and computer fault
- An explanation of how the learner used verification information
- Observing the learner during the shift, and questioning them during or outside the shift
- Witness testimony from the learner's line manager
- An explanation of how the learner would proceed in the event of IT failure during the shift

Potential errors and omissions should include at least one of the following: equipment; procedures; information; products.

The learner's work should fit into Quality Assurance programmes to ensure continuous improvement.

For the Assessment Criteria relating to the learner's knowledge, different types of evidence and assessment methods could be used, for example learner statements, questioning and professional discussion which should be recorded for verification.

Assessment Guidance

- Simulation is acceptable for this unit only when it is not possible to generate evidence of a real activity being performed, but must be in line with the requirements of GQA.

Assessment Context

The following terms have a specific meaning in this unit:

Central guidance is the Chief Forecaster's guidance issued by the forecasting organisation

Forecasts: site-specific; covering a wider geographical area

Learning Outcome and Assessment Criteria

Learning outcomes **The learner will:**	**Assessment criteria** **The learner can:**
1. Detect and correct errors and omissions	1.1. Locate and challenge inconsistent data in a methodical manner 1.2. Adhere to local procedures for checking products to identify any errors and omissions 1.3. Correctly complete and disseminate corrections in a timely manner in accordance with standard operating procedures 1.4. Flag and refer suspect data for guidance and resolution
2. Review their forecasts made during previous shifts	2.1. Utilise all relevant sources of information to verify their forecasts made during previous shifts 2.2. Identify any inconsistencies between their forecasts and the verifying data 2.3. Demonstrate areas where their forecasts added value to the central guidance and/or Numerical Weather Prediction output 2.4. Identify areas where further improvement to their forecasts could be made in the future
3. Know how to detect and correct errors and omissions	3.1. Explain how forecasters are accountable for their work and how to correctly carry out their responsibilities 3.2. Explain the difference between an error and a point of contention which may require clarification 3.3. Describe why it is important that local procedures for checking and identifying errors/omissions are used consistently 3.4. Justify the priorities, communication methods and time constraints in making corrections 3.5. Describe the action that should be taken in the event of repeated cases of discrepancies, inconsistencies and malfunctions 3.6. Describe how you would handle a complaint from a customer
4. Know how to follow the business continuity procedures	4.1. State the contingency planning arrangements in the event of Information Technology failure or other emergency when monitoring the weather 4.2. State the contingency planning arrangements in the event of Information Technology failure or other emergency when preparing the forecast values 4.3. State the contingency planning arrangements in the event of Information Technology failure or other emergency when communicating with the customer

	4.4. State the procedures that should be followed if any part of the forecast process cannot be completed, from the perspective of either a customer or a colleague
5. Know how to review the forecasts made during previous shifts	5.1. Describe the local procedures for the verification of forecasts 5.2. Explain the factors that caused the differences between the forecast and the verifying data 5.3. Describe who may be interested in the reviews, and why these people need to know

UNIT MET 16B	**CONVEY METEOROLOGICAL INFORMATION AND WEATHER FORECASTS TO USERS**
LEVEL	**5**
GUIDED LEARNING HOURS	**15**

Unit Overview

This unit describes the activities and understanding needed to demonstrate that the learner can convey meteorological information and weather forecasts to individuals and small groups as well as responding to ad hoc meteorological enquires. The learner will need to follow their organisation's procedures when dealing with these enquiries, responding appropriately to the person they are replying to.

Assessment Guidance and Evidence Requirements

Evidence Requirements

The learner should provide evidence to meet the requirements of the Assessment Criteria, and those aspects of the Assessment Context (described below) that are relevant to their workplace and work role.

The learner must be observed briefing users of meteorological information and weather forecasts over a sustained period. For this unit relevant evidence could include:

- Observing the learner and them answering questions about handling queries, giving and presenting information
- Feedback from those the learner has briefed
- Videos of briefings made
- Notes of telephone conversations
- Letters from interested individuals and the learner's responses
- Hard copies of briefing packs

Those receiving briefs should include at least one of the following: other forecasters at handover; individual customers; groups of fewer than ten customers.

For the Assessment Criteria relating to the learner's knowledge, different types of evidence and assessment methods could be used, for example learner statements, questioning and professional discussion which should be recorded for verification.

Assessment Guidance

- The use of simulation is not acceptable in the assessment of this unit.

Assessment Context

The following terms have a specific meaning in this unit:

Type of enquirer: informed customer; non-technical customer

Weather conditions: benign, hazardous

Hazardous weather conditions will occur in synoptic situations which lead to significant impact on customer's operations within the sphere of the learner's responsibility, and where relevant will lead to the learner issuing a warning. Depending on the customers involved, these may include but not be limited to – frontal passage, low cloud and advection fog during warm sector, cumulonimbus and associated warnings during unstable conditions, radiation fog due to high pressure, significant winds, passage of an active trough, cold

weather bringing frost, ice, snow and freezing precipitation, and scenarios where there are rapid fluctuations in low cloud and/or visibility.

Learning Outcome and Assessment Criteria

Learning outcomes **The learner will:**	**Assessment criteria** **The learner can:**
1. Respond to ad hoc enquiries about the weather	1.1. Act towards the person making the enquiry with courtesy and consideration 1.2. Listen attentively to the enquiry and ask questions if necessary to identify the underlying concern 1.3. Express with confidence relevant meteorological information, using appropriate language and considering customer impacts 1.4. Summarise where appropriate and then confirm the enquirer's understanding and/or satisfaction with their response
2. Brief individuals and small groups about the weather	2.1. Prepare relevant materials prior to the briefing to facilitate effective contributions 2.2. Present the information in a logical and structured fashion, with clear and concise introductions and summaries 2.3. Reply to questions by providing answers where possible or by agreeing what should be done 2.4. Confirm the other parties' understanding of the briefing 2.5. Adhere to relevant time constraints
3. Know how to respond to ad hoc enquiries about the weather	3.1. Explain the enquirer's underlying requirements 3.2. Describe the meteorological information which will help address the enquirer's requirements 3.3. Explain the appropriateness of their choice of language to convey the information
4. Know how to brief individuals and small groups about the weather	4.1. Explain the requirements of the people being briefed 4.2. Justify the inclusion of the particular information in the briefing 4.3. Explain how the briefing information is likely to be used