ST1404/

DRAFT END-POINT ASSESSMENT PLAN FOR THE WATER INDUSTRY ASSET MAINTENANCE TECHNICIAN APPRENTICESHIP

APPRENTICESHIP REFERENCE NUMBER	LEVEL OF THIS END-POINT ASSESSMENT (EPA)	INTEGRATION
ST1404	3	None

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This EPA has options. Display the EPA for:

All Water industry asset maintenance technician - mechanical Water industry asset maintenance technician - electrical Water industry asset maintenance technician - instrumentation, control and automation

Introduction and overview

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This document explains the requirements for end-point assessment (EPA) for the water industry asset maintenance technician apprenticeship. End-point assessment organisations (EPAOs) must follow this when designing and delivering the EPA.
Water industry asset maintenance technician apprentices, their employers and training providers should read this document.
This is a core and options apprenticeship. An apprentice must be trained and assessed against the core and one option. The options are:

- Water industry asset maintenance technician - mechanical
- Water industry asset maintenance technician - electrical
- Water industry asset maintenance technician - instrumentation, control and automation

A full-time water industry asset maintenance technician apprentice typically spends 36 months on-programme. The apprentice must spend at least 12 months on-programme and complete the required amount of off-the-job training in line with the apprenticeship funding rules.
The EPA should be completed within an EPA period lasting typically 3 months.
The apprentice must complete their training and meet the gateway requirements before starting their EPA. The EPA will assess occupational competence.

An approved EPAO must conduct the EPA for this apprenticeship. Employers must work with the training provider to select an approved EPAO from the apprenticeship providers and assessment register (APAR).
This EPA has 3 assessment methods.
The grades available for each assessment method are below.

Assessment method 1 - observation with questions:
- fail
- pass

Assessment method 2 - interview underpinned by a portfolio of evidence:
- fail
- pass
- distinction

Assessment method 3 - multiple-choice test:
- fail
- pass

The result from each assessment method is combined to decide the overall apprenticeship grade. The following grades are available for the apprenticeship:

- fail
- pass
- distinction

EPA summary table

Edit epa gateway formEdit available grades formEdit overall epa grading formEdit re-sits and re-takes form

On-programme - typically 36 months	The apprentice must: • complete training to develop the knowledge, skills and behaviours (KSBs) outlined in this apprenticeship's standard • complete training towards English and mathematics qualifications in line with the apprenticeship funding rules • compile a portfolio of evidence
End-point assessment gateway	The apprentice's employer must be content that the apprentice is occupationally competent.

	The apprentice must: • confirm they are ready to take the EPA • have achieved English and mathematics qualifications in line with the apprenticeship funding rules For the interview underpinned by a portfolio of evidence, the apprentice must submit a portfolio of evidence. Gateway evidence must be submitted to the EPAO, along with any organisation specific policies and procedures requested by the EPAO.
End-point assessment - typically 3 months	**The grades available for each assessment method are below** Observation with questions: • fail • pass Interview underpinned by a portfolio of evidence: • fail • pass • distinction Multiple-choice test: • fail • pass **Overall EPA and apprenticeship can be graded:** ○ fail ○ pass ○ distinction
Professional recognition	This apprenticeship aligns with: • Institute of Water (TBC) for EngTech (TBC)
Re-sits and re-takes	The details for re-sits and re-takes are below: • re-take and re-sit grade cap: pass • re-sit timeframe: typically 3 months • re-take timeframe: typically 6 months

Duration of end-point assessment period

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The EPA is taken in the EPA period. The EPA period starts when the EPAO confirms the gateway requirements have been met and is typically 3 months.
The EPAO should confirm the gateway requirements have been met and start the EPA as quickly as possible.

EPA gateway

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The apprentice's employer must be content that the apprentice is occupationally competent. That is, they are deemed to be working at or above the level set out in the apprenticeship standard and ready to undertake the EPA. The employer may take advice from the apprentice's training provider, but the employer must make the decision. The apprentice will then enter the gateway.
The apprentice must meet the gateway requirements before starting their EPA.

They must:

- confirm they are ready to take the EPA

- have achieved English and mathematics qualifications in line with the apprenticeship funding rules
- submit a portfolio of evidence for the interview underpinned by a portfolio of evidence

Portfolio of evidence requirements:
The apprentice must compile a portfolio of evidence during the on-programme period of the apprenticeship. It should only contain evidence related to the KSBs that will be assessed by the interview. It will typically contain 10 discrete pieces of evidence. Evidence must be mapped against the KSBs. Evidence may be used to demonstrate more than one KSB; a qualitative as opposed to quantitative approach is suggested.
Evidence sources may include workplace documentation and records, for example:

- workplace policies and procedures
- witness statements
- annotated photographs
- video clips with a maximum total duration 10 minutes; the apprentice must be in view and identifiable

This is not a definitive list; other evidence sources can be included.
The portfolio of evidence should not include reflective accounts or any methods of self-assessment. Any employer contributions should focus on direct observation of performance, for example, witness statements, rather than opinions. The evidence provided should be valid and attributable to the apprentice; the portfolio of evidence should contain a statement from the employer and apprentice confirming this.
The EPAO should not assess the portfolio of evidence directly as it underpins the interview. The independent assessor should review the portfolio of evidence to prepare questions for the interview. They are not required to provide feedback after this review.
Gateway evidence must be submitted to the EPAO, along with any organisation specific policies and procedures requested by the EPAO.

Order of assessment methods

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The assessment methods can be delivered in any order. The result of one assessment method does not need to be known before starting the next.

Observation with questions

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Overview

In the observation with questions, an independent assessor observes the apprentice in their workplace and asks questions. The apprentice completes their day-to-day duties under normal working conditions. Simulation is not allowed. It gives the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method.

Rationale

This assessment method is being used because:

- this is a practical role it can assess KSBs holistically
- it should give employers assurance about an apprentice's competence as it takes place in a real work setting the familiar environment should allow the apprentice to perform at their best
- it is cost effective, tasks completed during the observation should contribute to workplace productivity and it makes use of the employer's resources and equipment

- it allows for the assessment of KSBs that relate to interaction with colleagues, customers or members of the public

Delivery

The observation with questions must be structured to give the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method to the highest available grade.
An independent assessor must conduct and assess the observation with questions.
The independent assessor must only observe one apprentice at a time to ensure quality and rigour. They must be as unobtrusive as possible.
The EPAO must give the apprentice 2 weeks' notice of the observation with questions.
The observation must take 4 hours.
The observation may be split into discrete sections held on the same working day.
The EPAO must manage invigilation of the apprentice during the assessment, to maintain security of the EPA, in line with their malpractice policy. This includes breaks and moving between locations.
The independent assessor must explain to the apprentice the format and timescales of the observation with questions before it starts. This does not count towards the assessment time.
The independent assessor should observe the following during the observation:
All apprentices will be observed carrying out the following core activities:

- prepare for work
- health and safety
- documentation and written communication

Apprentices following the mechanical option will also be observed carrying out the following activities:

- repair or maintenance

Apprentices following the electrical option will also be observed carrying out the following activities:

- repair or maintenance

Apprentices following the instrumentation, control and automation option will also be assessed carrying out the following:

- configure and calibrate
- repair or maintenance

These activities provide the apprentice with the opportunity to demonstrate the KSBs mapped to this assessment method.
The independent assessor must ask questions. Questioning can occur both during and after the observation.
The purpose of the questions is:

- to seek clarification where required
- to assess the level of competence against the grading descriptors

The time for questioning is included in the overall assessment time. The independent assessor must ask at least 5 questions. To remain as unobtrusive as possible, the independent assessor should ask questions during natural stops between tasks and after completion of work rather than disrupting the apprentice's flow. The independent assessor must use the questions from the EPAO's question bank. Follow-up questions are allowed where clarification is required.
The independent assessor must ask questions about KSBs that were not observed to gather assessment evidence. These questions are in addition to the above set number of questions for the observation with questions and should be kept to a minimum.
The apprentice may choose to end the assessment method early. The apprentice must be confident they have demonstrated competence against the assessment requirements for the assessment method. The

independent assessor or EPAO must ensure the apprentice is fully aware of all assessment requirements. The independent assessor or EPAO cannot suggest or choose to end the assessment methods early, unless in an emergency. The EPAO is responsible for ensuring the apprentice understands the implications of ending an assessment early if they choose to do so. The independent assessor may suggest the assessment continues. The independent assessor must document the apprentice's request to end the assessment early.

The independent assessor must make the grading decision. The independent assessor must assess the observation and responses to questions holistically when deciding the grade.
The independent assessor must keep accurate records of the assessment. They must record:

- the KSBs observed
- the apprentice's answers to questions
- the KSBs demonstrated in answers to questions
- the grade achieved

Assessment location

The observation with questions must take place in the apprentice's normal place of work for example, their employer's premises or a customer's premises. Equipment and resources needed for the observation must be confirmed to be available by the EPAO, who can liaise with the employer to provide these. They must be in good and safe working condition.
Questioning that occurs after the observation should take place in a suitable environment, for example a quiet room, free from distractions and influence.

Question and resource development

The EPAO must develop a purpose-built assessment specification and question bank. It is recommended this is done in consultation with employers of this occupation. The EPAO must maintain the security and confidentiality of EPA materials when consulting with employers. The assessment specification and question bank must be reviewed at least once a year to ensure they remain fit-for-purpose.
The assessment specification must be relevant to the occupation and demonstrate how to assess the KSBs mapped to this assessment method. The EPAO must ensure that questions are refined and developed to a high standard. The questions must be unpredictable. A question bank of sufficient size will support this.
The EPAO must produce the following materials to support the observation with questions:

- independent assessor assessment materials which include:
- training materials
- administration materials
- moderation and standardisation materials
- guidance materials
- grading guidance
- question bank
- EPA guidance for the apprentice and the employer

The EPAO must ensure that the EPA materials are subject to quality assurance procedures including standardisation and moderation.

Interview underpinned by a portfolio of evidence

Edit interview underpinned by a portfolio of evidence form

Overview

In the interview, an independent assessor asks the apprentice questions. It gives the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method.

Rationale

This assessment method is being used because:

- it assesses KSBs holistically and objectively
- it allows for the assessment of KSBs that do not occur on a predictable or regular basis

- it allows for assessment of responses where there are a range of potential answers
- it can be conducted remotely, potentially reducing cost

Delivery

The interview must be structured to give the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method to the highest available grade.
An independent assessor must conduct and assess the interview.
The purpose of the independent assessor's questions will be to assess the apprentice's competence against the following themes:

All apprentices will be assessed against the following themes:

- role, responsibilities and requirements
- planning for work
- health, safety, security, environment and sustainability
- continual improvement and CPD
- equity and diversity
- team working and communication
- ICT and digital
- installation, commissioning and decommissioning
- repair or maintenance
- fault finding and problem solving

In addition, apprentices following the mechanical option will also be assessed against the following themes:

- installation, commissioning and decommissioning
- repair or maintenance
- fault finding and problem solving

In addition, apprentices following the electrical option will also be assessed against the following themes:

- installation, commissioning and decommissioning
- fault finding and problem solving

In addition, apprentices following the instrumentation, control and automation option will also be assessed against the following themes:

- installation, commissioning and decommissioning
- calibration, configuration and software
- fault finding and problem solving

The EPAO must give an apprentice 2 weeks' notice of the interview.
The independent assessor must have at least 2 weeks to review the supporting documentation.
The apprentice must have access to their portfolio of evidence during the interview.
The apprentice can refer to and illustrate their answers with evidence from their portfolio of evidence however, the portfolio of evidence is not directly assessed.
The interview must last for 90 minutes. The independent assessor can increase the time of the interview by up to 10%. This time is to allow the apprentice to respond to a question if necessary.

The independent assessor must ask at least 10 questions. The independent assessor must use the questions from the EPAO's question bank or create their own questions in line with the EPAO's training. Follow-up questions are allowed where clarification is required.
The apprentice may choose to end the assessment method early. The apprentice must be confident they have demonstrated competence against the assessment requirements for the assessment method. The independent assessor or EPAO must ensure the apprentice is fully aware of all assessment requirements. The independent assessor or EPAO cannot suggest or choose to end the assessment methods early, unless in an emergency. The EPAO is responsible for ensuring the apprentice understands the implications of ending an assessment early if they choose to do so. The independent assessor may suggest the assessment continues. The independent assessor must document the apprentice's request to end the assessment early. The independent assessor must make the grading decision.
The independent assessor must keep accurate records of the assessment. They must record:

- the apprentice's answers to questions
- the KSBs demonstrated in answers to questions
- the grade achieved

Assessment location

The interview must take place in a suitable venue selected by the EPAO for example, the EPAO's or employer's premises.
The interview can be conducted by video conferencing. The EPAO must have processes in place to verify the identity of the apprentice and ensure the apprentice is not being aided.
The interview should take place in a quiet room, free from distractions and influence.

Question and resource development

The EPAO must develop a purpose-built assessment specification and question bank. It is recommended this is done in consultation with employers of this occupation. The EPAO must maintain the security and confidentiality of EPA materials when consulting with employers. The assessment specification and question bank must be reviewed at least once a year to ensure they remain fit-for-purpose.
The assessment specification must be relevant to the occupation and demonstrate how to assess the KSBs mapped to this assessment method. The EPAO must ensure that questions are refined and developed to a high standard. The questions must be unpredictable. A question bank of sufficient size will support this.
The EPAO must ensure that the apprentice has a different set of questions in the case of re-sits or re-takes.
The EPAO must produce the following materials to support the interview underpinned by a portfolio of evidence:

- independent assessor assessment materials which include:
    - training materials
    - administration materials
    - moderation and standardisation materials
    - guidance materials
    - grading guidance
    - question bank
- EPA guidance for the apprentice and the employer

The EPAO must ensure that the EPA materials are subject to quality assurance procedures including standardisation and moderation.

Multiple-choice test

Edit multiple-choice test form

Overview

In the multiple-choice test, the apprentice answers questions in a controlled and invigilated environment. It gives the apprentice the opportunity to demonstrate the knowledge mapped to this assessment method.

Rationale

This assessment method is being used because:

- it can assess knowledge it is easy to administer

- it can be conducted remotely and administered to multiple apprentices at the same time, potentially reducing cost

Delivery

The multiple-choice test must be structured to give the apprentice the opportunity to demonstrate the knowledge mapped to this assessment method to the highest available grade.
The test must be computer based.

The test will consist of 30 multiple-choice questions.
Multiple-choice questions must have four options, including one correct answer.
The apprentice must be given at least 2 weeks' notice of the date and time of the test.

Test administration

The apprentice must have 60 minutes to complete the test.
The test is closed book which means that the apprentice cannot refer to reference books or materials whilst taking the test.
The following equipment is allowed to be used during the test:

- a scientific calculator

The test must be taken in the presence of an invigilator who is the responsibility of the EPAO. The EPAO must have an invigilation policy setting out how the test must be conducted. It must state the ratio of apprentices to invigilators for the setting and allow the test to take place in a secure way.

The EPAO must verify the apprentice's identity and ensure invigilation of the apprentice for example, with 360-degree cameras and screen sharing facilities.

The EPAO is responsible for the security of the test including the arrangements for on-line testing. The EPAO must ensure that their security arrangements maintain the validity and reliability of the test.

Marking

The test must be marked by an independent assessor or marker employed by the EPAO. They must follow a marking scheme produced by the EPAO. Marking by computer is allowed where question types support this.

A correct answer gets 1 mark.
Any incorrect or missing answers get zero marks.

The EPAO is responsible for overseeing the marking of the test.

Assessment location

The apprentice must take the test in a suitably controlled and invigilated environment that is a quiet room, free from distractions and influence. The EPAO must check the venue is suitable.

The test can take place remotely if the appropriate technology and systems are in place to prevent malpractice.

Question and resource development

The EPAO must develop a purpose-built assessment specification and question bank. It is recommended this is done in consultation with employers of this occupation. The EPAO should maintain the security and confidentiality of EPA materials when consulting with employers. The assessment specification and question bank must be reviewed at least once a year to ensure they remain fit-for-purpose.

The assessment specification must be relevant to the occupation and demonstrate how to assess the KSBs mapped to this assessment method. The EPAO must ensure that questions are refined and developed to a high standard. The questions must be unpredictable. A question bank of sufficient size will support this.

The EPAO must ensure that the apprentice has a different set of questions in the case of re-sits or re-takes.

The EPAO must produce the following materials to support the test:

- assessment materials for independent assessors and markers which includes:
    - training materials
    - administration materials
    - moderation and standardisation materials
    - guidance materials
    - grading guidance
    - test specification
    - sample test and mark schemes
    - live tests and mark schemes
    - question bank
- EPA guidance for the apprentice and the employer

The EPAO must ensure that the EPA materials are subject to quality assurance procedures including standardisation and moderation.

Grading

Edit add grade descriptor formEdit mapping of ksbs to grade themes formEdit available grades form

Observation with questions

Fail - does not meet pass criteria

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS
(Core) Prepare for work S3	Identifies, organises and uses resources to complete tasks with consideration for process, cost, quality, safety, security and environmental impact. (S3)
(Core) Health and safety K7 S4 S7 B1	Takes responsibility for and proactively promotes health and safety in the workplace by following safe systems of work and using PPE, in compliance with health and safety regulations, standards and guidance. (K7, S4, B1)

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS
	Restores the work area on completion of the activity in line with company or task requirements. (S7)
(Core) Documentation and written communication K15 S8	Communicates in writing in the workplace and records or enters information for work tasks, using paper-based or electronic methods in line with procedures and task requirements. (K15, S8)
(Water industry asset maintenance technician - mechanical) Repair or maintenance K24 K26 K27 K29 S18 S19 S20 S21 S22 S24 S30	Uses mechanical theories and principles to isolate, depressurise, disconnect and remove mechanical plant or equipment in preparation for installation or repair or maintenance work in accordance with work permits and employer's safe isolation policies. (K24, S18, S21, S30) Uses tools, equipment or components for installation, or maintenance or repair of mechanical systems in line with procedures and manufacturers' guidelines. (K27, S20) Applies repair or maintenance practices and techniques to repair or maintain machinery, equipment or components in line with manufacturer's guidelines and task requirements. (K26, S19) Monitors, inspects or tests mechanical systems, equipment or components in line with manufacturer's inspection and testing requirements. (K29, S22, S24)
(Water industry asset maintenance technician - electrical) Repair or maintenance K38 K42 K44 K45 S33 S34 S38 S39 S40	Uses electrical theories and principles to isolate plant or electrical equipment in

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS
	preparation for installation or repair or maintenance work in accordance with work permits and employer's safe isolation policies. (K38, S33, S39) Uses tools, equipment or components for installation or maintenance or repair of electrical systems in line with procedures and manufacturers' guidelines. (K42, S38) Applies repair or maintenance practices and techniques to repair or maintain equipment or components in line with manufacturer's guidelines and task requirements. (K45, S34) Inspects or tests electrical installations and equipment in accordance with manufacturer's inspection and testing requirements. (K44, S40)
(Water industry asset maintenance technician - instrumentation, control and automation) Configure and calibrate K54 K62 S47 S48 S55	Calibrates and monitors open or closed loop systems in first or second order control systems, in line with task requirements. (K54, S48) Configures and calibrates ICA equipment, instrumentation and control devices to required precision and tolerance in line with employer's procedures and task requirements. (K62, S47, S55)
(Water industry asset maintenance technician - instrumentation, control and automation) Repair or maintenance K52 K55 K56 K59 S45 S49 S51 S53 S57 S61	Use electrical theories and principles to isolate plant or ICA equipment in preparation for installation or repair or maintenance work, in accordance with work permits

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS
	and employer's safe isolation policies. (K55, S45, S57) Uses tools, equipment or components for installation, or maintenance or repair of ICA systems in line with procedures and manufacturer's guidelines. (K56, S49) Applies repair or maintenance practices and techniques to instrumentation, control equipment, control systems, instruments, controllers, probes, attachments, cabling, meters and display units in line with manufacturer's guidelines and task requirements. (K52, S51) Inspects or tests ICA equipment to assess condition and identifies action required in line with manufacturer's inspection and testing requirements. (K59, S53, S61)

Interview underpinned by a portfolio of evidence

Fail - does not meet pass criteria

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
(Core) Role, responsibilities and requirements K2 K5 S1	Describes the responsibilities, limits of autonomy and reporting channels applicable to their role and	Explains the importance for the business of complying with water industry standards, legislative and regulatory

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
	how they work in line with industry legislative requirements, standards and regulatory requirements. (K2, K5, S1)	requirements. (K2, K5, S1)
(Core) Planning for work K11 K13 K14 S2 S6	Describes the planning, prioritising, work scheduling and time management approaches they use to plan installation, repair or maintenance work and how they take process safety, risk assessments and the impact work has on the environment and on water treatment and wastewater recycling processes into consideration as part of their planning. (K11, S2) Describes the planned, preventative, predictive and reactive	None.

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
	maintenance strategies and techniques used in their workplace and outlines the frequency of each method in accordance with company procedures. (K14) Explains how they select, check, including calibration checks, store and maintain tools and equipment, used for installation or maintenance or repair tasks in line with manufacturers guidelines and operating instructions. (K13, S6)	
(Core) Health, safety, security, environment and sustainability K8 K10 K12 K16 K17 S5 S15 B2 B6	Outlines the personal hygiene risks and requirements for working on a water treatment or wastewater treatment site. (K16)	Explains the importance of following their employer's process safety, process risk assessments and incident management

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
	Describes how they consider the environment and work sustainably by following sustainability principles in line with organisational procedures, regulations and standards for material reuse and recycling. Explains the impact water industry operations have on the environment. (K10, S5, B2) States the ATEX and DSEAR regulations which they must follow when working in and around explosive atmospheres. (K8) Explains how they proactively identify issues and take responsibility for their own actions when following organisational asset security	procedures. (K17)

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
	requirements for site access, documentation and securing assets. (K12, S15, B6) Describes how they follow their employer's process safety, process risk assessments and incident management procedures. (K17)	
(Core) Continual improvement and CPD K18 S12 S14 B3 B7	Describes how they have sought to improve ways of working by applying a continuous improvement technique to devise a suggestion for asset or process optimisation or improvement. (K18, S12, B3) Outlines the learning and development activities they have carried out and shows a commitment to future continued professional	Their suggestion has the potential to improve the work of the wider team, workplace, or system. (K18, S12, B3)

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
	development to maintain and enhance competence. (S14, B7)	
(Core) Equity and diversity K19 S10 B4	Describes how they promote inclusivity in the workplace by applying the principles of equity, diversity and inclusion, taking account of unconscious bias. (K19, S10, B4)	None.
(Core) Team working and communication K20 K21 S11 S13 B5	Describes how they collaborate and promote teamwork across disciplines by applying team working principles in line with organisational policy. (K20, S11, B5) Describes how they have used non-written communication methods and techniques and engineering maintenance terminology to communicate	None.

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
	technical advice, work updates and information and provide support to technical and non-technical colleagues and other stakeholders to support task completion. (K21, S13)	
(Core) ICT and digital K22 S9	Describes how they use information and digital technology to collect, interpret and use data and information, in compliance with cyber security regulations and policies and GDPR. (K22, S9)	Outlines the benefits to the business of ensuring GDPR and cyber security regulations and policies are followed. (K22, S9)
(Water industry asset maintenance technician - mechanical) Installation, commissioning and decommissioning K25 S16	Describes the practices and techniques they use to install, commission and decommission mechanical systems and equipment in line with manufacturer's requirements. (K25, S16)	None.

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
(Water industry asset maintenance technician - mechanical) Repair or maintenance K30 K31 K33 S17 S26 S27 S28 S29	Describes how they use machinery to carry out basic fabrication, welding and thermal cutting processes for mechanical components and structures to complete the task in accordance with task requirements and manufacturer's instructions. (K30, S27, S29) Describes how they apply bench fitting techniques to assemble mechanical equipment or components in line with specification and task requirements. (K31, S28) Describes how they use and interpret manufacturers' instructions, design specifications, plans and drawings to position and	Explains how they completed fabrication tasks for mechanical components and structures within tolerances, specifications and right first time for task requirements. (K30, S27)

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
	install mechanical equipment or components in line with specification and task requirements. (K33, S17, S26)	
(Water industry asset maintenance technician - mechanical) Fault finding and problem solving K28 S23 S25	Describes how they use fault finding, problem solving and rectification techniques, aids and diagnostic equipment to fault find, identify a problem, identify the underlying cause and identify a solution. (K28, S23, S25)	Explains how they identify reasons for faults ocurring and outlines preventative actions in line with organisational policy and procedures. (K28, S23)
(Water industry asset maintenance technician - electrical) Installation, commissioning and decommissioning K35 K37 K39 K40 K43 K46 K48 S32 S35 S36 S41 S42	Describes the practices and techniques they use to install, commission and decommission cabling and electrical equipment in line with manufacturer's requirements and wiring regulations. (K35, K46, S32)	Justifies the modifications made to electrical circuits to achieve the task requirements. (K37, S35)

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
	Describes how they use electrical drawings, design specifications, plans and manufacturer's instructions to modify electrical circuits, installing different cable types and terminating in accordance with the specification and application. (K37, K43, K48, S35, S41, S42) Describes how they interrogate different types of intelligent control equipment, including PLCs HMIs, Intelligent Starters and Variable Speed Drives to monitor system performance in accordance with employer's procedures. (K39, S36) Explains how to interpret basic telemetry signals received	

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
	from outstations. (K40)	
(Water industry asset maintenance technician - electrical) Fault finding and problem solving K41 S37 S44	Describes how the use fault finding, problem solving and rectification techniques, aids and diagnostic equipment to fault find, identify a problem, identify the underlying cause and identify a solution. (K41, S37, S44)	Explains how they identify reasons for faults ocurring and outlines preventative actions in line with organisational policy and procedures. (K41, S37)
(Water industry asset maintenance technician - instrumentation, control and automation) Installation, commissioning and decommissioning K51 K60 K61 K64 S46 S54 S58	Describes the practices and techniques they use to install, commission and decommission I CA equipment in line with manufacturer's requirements and wiring regulations. (K51, K61, S46) Describes how they use and interpret design specifications, plans drawings and manufacturer's instructions to	None.

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
	install different cable types and terminate in accordance with the specification and application. (K60, K64, S54, S58)	
(Water industry asset maintenance technician - instrumentation, control and automation) Calibration, configuration and software K57 K65 K66 K67 S50 S59 S60 S63	Describes how they test telemetry signals and configure outstations, field instrumentation, communication devices and equipment used in system and process control in line with manufacturer's instructions. (K57, K65, S50, S59) Describes how they use software to produce programs to be used in the control system, to meet task requirements. (K67 S60) Explains how they monitor and analyse data to make evidence based	Justify the software chosen and explain how the steps of their written program met the task requirements. (K 67, S60)

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL OF THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
	changes if required. (K67, S63)	
(Water industry asset maintenance technician - instrumentation, control and automation) Fault finding and problem solving K58 S52 S62	Describes how they use fault finding, problem solving and rectification techniques, aids and diagnostic equipment to fault find, identify a problem, identify the underlaying cause and identify a solution. (K58, S52, S62)	Explains how they identify reasons for faults ocurring and outlines preventative actions in line with organisational policy and procedures. (K58, S52)

Multiple-choice test

GRADE	MINIMUM MARKS REQUIRED	MAXIMUM MARKS REQUIRED
Fail	0	23
Pass	24	30

Overall EPA grading

Edit overall epa grading form

Performance in the EPA determines the overall grade of:

- fail
- pass
- distinction

An independent assessor must individually grade the observation with questions and interview underpinned by a portfolio of evidence in line with this EPA plan.
The EPAO must combine the individual assessment method grades to determine the overall EPA grade.

If the apprentice fails one assessment method or more, they will be awarded an overall fail.

To achieve an overall pass, the apprentice must achieve at least a pass in all the assessment methods. To achieve an overall distinction, an apprentice must achieve a distinction in the interview underpinned by a portfolio of evidence and a pass in the multiple choice test and observation with questions.
Grades from individual assessment methods must be combined in the following way to determine the grade of the EPA overall.

OBSERVATION WITH QUESTIONS	INTERVIEW UNDERPINNED BY A PORTFOLIO OF EVIDENCE	MULTIPLE-CHOICE TEST	OVERALL GRADING
Fail	Any grade	Any grade	Fail
Any grade	Fail	Any grade	Fail
Any grade	Any grade	Fail	Fail
Pass	Pass	Pass	Pass
Pass	Distinction	Pass	Distinction

Re-sits and re-takes

Edit re-sits and re-takes form

If the apprentice fails one assessment method or more, they can take a re-sit or a re-take at their employer's discretion. The apprentice's employer needs to agree that a re-sit or re-take is appropriate. A re-sit does not need further learning, whereas a re-take does. The apprentice should have a supportive action plan to prepare for a re-sit or a re-take.

The employer and the EPAO should agree the timescale for a re-sit or re-take. A re-sit is typically taken within 3 months of the EPA outcome notification. The timescale for a re-take is dependent on how much re-training is required and is typically taken within 6 months of the EPA outcome notification.
Failed assessment methods must be re-sat or re-taken within a 6-month period from the EPA outcome notification, otherwise the entire EPA will need to be re-sat or re-taken in full.

Re-sits and re-takes are not offered to an apprentice wishing to move from pass to a higher grade.

The apprentice will get a maximum EPA grade of pass if they need to re-sit or re-take one or more assessment methods, unless the EPAO determines there are exceptional circumstances.

Roles and responsibilities

Edit roles and responsibilities form

ROLES	RESPONSIBILITIES
Apprentice	As a minimum, the apprentice should: • complete on-programme training to meet the KSBs as outlined in the apprenticeship standard for a minimum of 12 months • complete the required amount of off-the-job training specified by the apprenticeship funding rules and as arranged by the employer and training provider • understand the purpose and importance of EPA • prepare for and undertake the EPA including meeting all gateway requirements
Employer	As a minimum, the apprentice's employer must: • select the training provider

ROLES	RESPONSIBILITIES
	• work with the training provider to select the EPAO • work with the training provider, where applicable, to support the apprentice in the workplace and to provide the opportunities for the apprentice to develop the KSBs • arrange and support off-the-job training to be undertaken by the apprentice • decide when the apprentice is working at or above the apprenticeship standard and is ready for EPA • ensure the apprentice is prepared for the EPA • ensure that all supporting evidence required at the gateway is submitted in line with this EPA plan • confirm arrangements with the EPAO for the EPA in a timely manner, including who, when, where • provide the EPAO with access to any employer-specific documentation as required for example, company policies • ensure that the EPA is scheduled with the EPAO for a date and time which allows appropriate opportunity for the apprentice to meet the KSBs • ensure the apprentice is given sufficient time away from regular duties to prepare for, and complete the EPA • ensure that any required supervision during the EPA period, as stated within this EPA plan, is in place • ensure the apprentice has access to the resources used to fulfil their role and carry out the EPA for workplace based assessments • remain independent from the delivery of the EPA • pass the certificate to the apprentice upon receipt
EPAO	As a minimum, the EPAO must: • conform to the requirements of this EPA plan and deliver its requirements in a timely manner • conform to the requirements of the apprenticeship provider and assessment register • conform to the requirements of the external quality assurance provider (EQAP) • understand the apprenticeship including the occupational standard and EPA plan • make all necessary contractual arrangements including agreeing the price of the EPA

ROLES	RESPONSIBILITIES

	• develop and produce assessment materials including specifications and marking materials, for example mark schemes, practice materials, training material
	• maintain and apply a policy for the declaration and management of conflict of interests and independence. This must ensure, as a minimum, there is no personal benefit or detriment for those delivering the EPA or from the result of an assessment. It must cover:
	  ○ apprentices
	  ○ employers
	  ○ independent assessors
	  ○ any other roles involved in delivery or grading of the EPA
	• have quality assurance systems and procedures that ensure fair, reliable and consistent assessment and maintain records of internal quality assurance (IQA) activity for external quality assurance (EQA) purposes
	• appoint independent, competent, and suitably qualified assessors in line with the requirements of this EPA plan
	• appoint administrators, invigilators and any other roles where required to facilitate the EPA
	• deliver induction, initial and on-going training for all their independent assessors and any other roles involved in the delivery or grading of the EPA as specified within this EPA plan. This should include how to record the rationale and evidence for grading decisions where required
	• conduct standardisation with all their independent assessors before allowing them to deliver an EPA, when the EPA is updated, and at least once a year
	• conduct moderation across all of their independent assessors' decisions once EPAs have started according to a sampling plan, with associated risk rating of independent assessors
	• monitor the performance of all their independent assessors and provide additional training where necessary
	• develop and provide assessment recording documentation to ensure a clear and auditable process is in place for providing assessment decisions and feedback to all relevant stakeholders
	• use language in the development and delivery of the EPA that is appropriate to the level of the apprenticeship
	• arrange for the EPA to take place in a timely manner, in consultation with the employer

ROLES	RESPONSIBILITIES
	• provide information, advice, and guidance documentation to enable apprentices, employers and training providers to prepare for the EPA • confirm the gateway requirements have been met before they start the EPA for an apprentice • arrange a suitable venue for the EPA • maintain the security of the EPA including, but not limited to, verifying the identity of the apprentice, invigilation and security of materials • where the EPA plan permits assessment away from the workplace, ensure that the apprentice has access to the required resources and liaise with the employer to agree this if necessary • confirm the overall grade awarded • maintain and apply a policy for conducting appeals
Independent assessor	As a minimum, an independent assessor must: • be independent, with no conflict of interest with the apprentice, their employer or training provider, specifically, they must not receive a personal benefit or detriment from the result of the assessment • have, maintain and be able to evidence up-to-date knowledge and expertise of the occupation • have the competence to assess the EPA and meet the requirements of the IQA section of this EPA plan • understand the apprenticeship's occupational standard and EPA plan • attend induction and standardisation events before they conduct an EPA for the first time, when the EPA is updated, and at least once a year • use language in the delivery of the EPA that is appropriate to the level of the apprenticeship • work with other personnel, where used, in the preparation and delivery of assessment methods • conduct the EPA to assess the apprentice against the KSBs and in line with the EPA plan • make final grading decisions in line with this EPA plan • record and report assessment outcome decisions • comply with the IQA requirements of the EPAO • comply with external quality assurance (EQA) requirements
Training provider	As a minimum, the training provider must:

ROLES	RESPONSIBILITIES
	• conform to the requirements of the apprenticeship provider and assessment register • ensure procedures are in place to mitigate against any conflict of interest • work with the employer and support the apprentice during the off-the-job training to provide the opportunities to develop the KSBs as outlined in the occupational standard • deliver training to the apprentice as outlined in their apprenticeship agreement • monitor the apprentice's progress during any training provider led on-programme learning • ensure the apprentice is prepared for the EPA • work with the employer to select the EPAO • advise the employer, upon request, on the apprentice's readiness for EPA • ensure that all supporting evidence required at the gateway is submitted in line with this EPA plan • remain independent from the delivery of the EPA
Marker	As a minimum, the marker must: • attend induction training as directed by the EPAO • have no direct connection or conflict of interest with the apprentice, their employer or training provider • mark test answers in line with the EPAO's mark scheme and procedures
Invigilator	As a minimum, the invigilator must: • attend induction training as directed by the EPAO • not invigilate an assessment, solely, if they have delivered the assessed content to the apprentice • invigilate and supervise the apprentice during tests and in breaks during assessment methods to prevent malpractice in line with the EPAO's invigilation procedures

Reasonable adjustments

Edit reasonable adjustments form

Reasonable adjustments
The EPAO must have reasonable adjustments arrangements for the EPA.

This should include:

- how an apprentice qualifies for a reasonable adjustment
- what reasonable adjustments may be made

Adjustments must maintain the validity, reliability and integrity of the EPA as outlined in this EPA plan.

Special considerations
The EPAO must have special consideration arrangements for the EPA.

This should include:

- how an apprentice qualifies for a special consideration
- what special considerations will be given

Special considerations must maintain the validity, reliability and integrity of the EPA as outlined in this EPA plan.

Internal quality assurance

Edit internal quality assurance form

Internal quality assurance refers to the strategies, policies and procedures that an EPAO must have in place to ensure valid, consistent and reliable EPA decisions.

EPAOs for this EPA must adhere to the requirements within the roles and responsibilities table.

They must also appoint independent assessors who:

- have recent relevant experience of the occupation or sector to at least occupational level 3 gained in the last 1 years or significant experience of the occupation or sector

Value for money

Edit value for money form

Affordability of the EPA will be aided by using at least some of the following:

- completing applicable assessment methods online, for example computer-based assessment
- utilising digital remote platforms to conduct applicable assessment methods
- using the employer's premises
- conducting assessment methods on the same day

Professional recognition

Edit professional recognition form

This apprenticeship aligns with:

- Institute of Water (TBC) for EngTech (TBC)

Mapping of KSBs to assessment methods

Edit mapping of ksbs to assessment methods form

KNOWLEDGE	ASSESSMENT METHODS
K1: Core. Overview of water and wastewater industries. Regulators and stakeholders: Drinking Water Inspectorate (DWI), Water Services Regulation Authority (OFWAT), Consumer Council for Water (CCWater), Environment Agency (EA), Health and Safety Executive (HSE), and Department for Environment, Food and Rural Affairs (Defra) - roles and powers.	Multiple-choice test

KNOWLEDGE	ASSESSMENT METHODS
K2: Core. Awareness of water industry legislative and regulatory requirements. Materials in contact (WRAS approved), food grade lubricants.	Interview underpinned by a portfolio of evidence
K3: Core. Awareness of water and waste water process theory from source to recycling. Abstraction processes. Water treatment and disinfection processes. Water distribution, boosters and service reservoirs. Wastewater treatment, networks and pumping stations. Effluent discharges and parameters.	Multiple-choice test
K4: Core. Chemical dosing systems for water and wastewater. Risks, mitigations and safe systems of work. Equipment and storage to include pumps, valves and dosing lines.	Multiple-choice test
K5: Core. Water industry maintenance technician role, responsibilities, limits of autonomy and reporting channels.	Interview underpinned by a portfolio of evidence
K6: Core. Awareness of health and safety regulations, relevant to the occupation and the technician's responsibilities. CDM regulations. Control of Substances Hazardous to Health (COSHH). Display Screen Equipment. Due diligence. Electricity at work regulations (EaWR). Emergency evacuation procedures. Health and Safety at Work Act – responsibilities. Isolation and emergency stop procedures. Legionella. Lifting Operations and Lifting Equipment Regulations (LOLER). Lone working. Management systems of occupational health and safety ISO 45001. Manual handling. Near miss reporting. Noise regulation. Provision and use of Work Equipment Regulations (PUWER). Reporting of Injuries, Diseases, and Dangerous Occurrences Regulations (RIDDOR). Risk assessments. Safety equipment: guards, signage, fire extinguishers. Situational awareness. Slips, trips and falls. Types of hazards. Personal Protective Equipment (PPE). Working in confined spaces. Pressure Systems Safety Regulations (PSSR).	Multiple-choice test
K7: Core. Safe systems of work.	Observation with questions
K8: Core. Dangerous Substances and Explosive Atmospheres Regulations (DSEAR). ATEX compliance (safety requirements of the workplace and equipment used in explosive atmospheres). Working in and around explosive atmospheres. Hazardous areas (DSEAR zones). PPE. Intrinsically safe tools for working in explosive atmospheres. Exposure limits. Necessary forced pre-ventilation. Gas monitoring equipment.	Interview underpinned by a portfolio of evidence

KNOWLEDGE	ASSESSMENT METHODS
K9: Core. Water industry sustainability and environmental principles and requirements. Permits and operation conditions for water extraction. Requirements for disposing of discharges and waste. Monitoring emissions to air, land and water (MCERTS). Waste Electrical and Electronic Equipment (WEEE) Regulations.	Multiple-choice test
K10: Core. The impact water industry operations have on the environment.	Interview underpinned by a portfolio of evidence
K11: Core. Planning, prioritising, work scheduling and time management approaches.	Interview underpinned by a portfolio of evidence
K12: Core. Asset security requirements.	Interview underpinned by a portfolio of evidence
K13: Core. Tools and equipment used in maintenance and repair tasks. Operational checks, calibration, storage and maintenance requirements.	Interview underpinned by a portfolio of evidence
K14: Core. Maintenance strategies and techniques: planned, preventative, predictive and reactive methods and their frequency.	Interview underpinned by a portfolio of evidence
K15: Core. Written communication and documentation: methods and requirements - electronic and paper. Service records. Test results.	Observation with questions
K16: Core. Personal hygiene risks and requirements for working on a water treatment or a wastewater treatment site.	Interview underpinned by a portfolio of evidence
K17: Core. Water industry process safety and process risk assessments. Incidents and emergency situations (internal and external): pollution, loss of process, security, weather, and accidents: their potential impact. Incident management and procedures. The risk of pollution and untreated water in supply.	Interview underpinned by a portfolio of evidence
K18: Core. Continuous improvement techniques. Asset and process optimisation.	Interview underpinned by a portfolio of evidence
K19: Core. Principles of equity, diversity, and inclusion in the workplace. Unconscious bias.	Interview underpinned by a portfolio of evidence

KNOWLEDGE	ASSESSMENT METHODS
K20: Core. Team working principles.	Interview underpinned by a portfolio of evidence
K21: Core. Non-written communication methods and techniques. Engineering maintenance terminology.	Interview underpinned by a portfolio of evidence
K22: Core. Information technology and digital: digital interfaces, email, Management Information Systems (MIS), spreadsheets, presentation, word processing, virtual communication, learning platforms, work collaboration platforms. General Data Protection Regulation (GDPR). Cyber security.	Interview underpinned by a portfolio of evidence
K23: Water industry asset maintenance technician - mechanical. Mechanical: Mechanical theories and principles; pneumatics, hydraulics and pressure systems. Torque, gearbox ratios, flow ratios, step-down ratios. Machine specifications.	Multiple-choice test
K24: Water industry asset maintenance technician - mechanical. Mechanical: Safe isolation and depressurisation of mechanical plant and equipment in preparation for repair and maintenance work. Permits, safe isolation policies, lock off systems.	Observation with questions
K25: Water industry asset maintenance technician - mechanical. Mechanical: Practices and techniques for the installation, commissioning and decommissioning of mechanical systems and equipment.	Interview underpinned by a portfolio of evidence
K26: Water industry asset maintenance technician - mechanical. Mechanical: Repair and maintenance of machinery, equipment and components. Practices and techniques. Removing and replacing parts, set up, adjustment, cleaning and lubricating.	Observation with questions
K27: Water industry asset maintenance technician - mechanical. Mechanical: Tools, equipment and components used for the installation, repair and maintenance of mechanical systems. Application, operation, care and calibration requirements.	Observation with questions
K28: Water industry asset maintenance technician - mechanical. Mechanical: Fault finding, problem solving and rectification techniques. Aids and diagnostic equipment.	Interview underpinned by a portfolio of evidence
K29: Water industry asset maintenance technician - mechanical. Mechanical: Inspection, monitoring and testing requirements and techniques.	Observation with questions
K30: Water industry asset maintenance technician - mechanical.	Interview underpinned by a portfolio of evidence

KNOWLEDGE	ASSESSMENT METHODS
Mechanical: Basic fabrication, welding and thermal cutting processes for mechanical components and structures.	
K31: Water industry asset maintenance technician - mechanical. Mechanical: Bench fitting techniques.	Interview underpinned by a portfolio of evidence
K32: Water industry asset maintenance technician - mechanical. Mechanical: Types and application of machinery. For example: lathes, pillar drills, milling machine, threading machine, mechanical saws. Machine speeds for different materials.	Multiple-choice test
K33: Water industry asset maintenance technician - mechanical. Mechanical: Design specifications, plans, drawings and manufacturer's instructions.	Interview underpinned by a portfolio of evidence
K34: Water industry asset maintenance technician - mechanical. Mechanical: Round numbers, scientific notation, percentages and ratios. Area, perimeter, volume and surface area. Scales, tables, graphs and charts. Trigonometry and Pythagoras' Theorem. Engineering formulae. Sequence of operations. Conversions and calculations.	Multiple-choice test
K35: Water industry asset maintenance technician - electrical. Electrical: Practices and techniques for the installation, commissioning and decommissioning of cabling and electrical equipment.	Interview underpinned by a portfolio of evidence
K36: Water industry asset maintenance technician - electrical. Electrical - Electrical theories and principles. Basic concepts of electricity. Ohms law, Kirchoff's law, circuits, conductors and insulators, basic AC theory, complex numbers, resistance and impedance - capacitive and inductive, transformers, polyphase AC circuits, power factor. Harmonics.	Multiple-choice test
K37: Water industry asset maintenance technician - electrical. Electrical: Design and modification of electrical circuits.	Interview underpinned by a portfolio of evidence
K38: Water industry asset maintenance technician - electrical. Electrical: Safe isolation of plant and electrical equipment in preparation for repair and maintenance work. Permits, safe isolation policies, lock off systems.	Observation with questions
K39: Water industry asset maintenance technician - electrical. Electrical - Types of intelligent control equipment. PLCs, HMIs, Intelligent starters, Variable Speed Drives (VSDs).	Interview underpinned by a portfolio of evidence
K40: Water industry asset maintenance technician - electrical. Electrical - Basic telemetry signals and outstations.	Interview underpinned by a portfolio of evidence

KNOWLEDGE	ASSESSMENT METHODS
K41: Water industry asset maintenance technician - electrical. Electrical - Fault finding, problem solving and rectification techniques, aids and diagnostic equipment.	Interview underpinned by a portfolio of evidence
K42: Water industry asset maintenance technician - electrical. Electrical: Tools, equipment and components used for the installation, repair and maintenance of electrical systems. Application, operation, care and calibration requirements.	Observation with questions
K43: Water industry asset maintenance technician - electrical. Electrical: Design specifications, plans, drawings and manufacturer's instructions.	Interview underpinned by a portfolio of evidence
K44: Water industry asset maintenance technician - electrical. Electrical: Inspection and testing requirements and techniques.	Observation with questions
K45: Water industry asset maintenance technician - electrical. Electrical - Repair and maintenance of equipment and components. Practices and techniques. Removing and replacing parts.	Observation with questions
K46: Water industry asset maintenance technician - electrical. Electrical: Awareness of wiring regulations - purpose and importance.	Interview underpinned by a portfolio of evidence
K47: Water industry asset maintenance technician - electrical. Electrical: Electrical drawings.	Multiple-choice test
K48: Water industry asset maintenance technician - electrical. Electrical - Cable types and termination methods. Specifications and application.	Interview underpinned by a portfolio of evidence
K49: Water industry asset maintenance technician - electrical. Electrical: Round numbers, scientific notation, percentages and ratios. Area, perimeter, volume and surface area. Scales, tables, graphs and charts. Trigonometry and Pythagoras' Theorem. Engineering formulae. Sequence of operations. Conversions and calculations.	Multiple-choice test
K50: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Electrical theories and principles. Basic concepts of electricity. Ohm's law, Kirchoff's law, circuits, conductors and insulators, basic AC theory, complex numbers, resistance and impedance - capacitive and inductive, transformers, polyphase AC circuits, power factor.	Multiple-choice test
K51: Water industry asset maintenance technician - instrumentation, control and automation.	Interview underpinned by a portfolio of evidence

KNOWLEDGE	ASSESSMENT METHODS
ICA: Practices and techniques for the installation, commissioning and decommissioning of ICA equipment.	
K52: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Repair and maintenance of instruments, controllers, sensors, probes, attachments, cabling, meters and display units. Practices and techniques.	Observation with questions
K53: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Instrumentation and control device operational principles: flow, level, pressure, analysers, transducers, transmitters, gauges. Proportional–integral–derivative controller.	Multiple-choice test
K54: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Open and closed loop systems. First and second order control systems.	Observation with questions
K55: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Safe isolation of plant and ICA equipment in preparation for repair and maintenance work. Permits, safe isolation policies, lock off systems.	Observation with questions
K56: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Tools, equipment and components used for the installation, repair and maintenance of control systems. Application, operation, care and calibration requirements.	Observation with questions
K57: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Field instrumentation, communication devices and equipment used in system and process control. To include: Human Machine Interfaces (HMIs), Programmable Logic Controllers (PLC), Supervisory Control and Data Acquisition (SCADA) systems, back up procedures. Configuration procedures and requirements.	Interview underpinned by a portfolio of evidence
K58: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Fault finding, problem solving and rectification techniques. Aids and diagnostic equipment.	Interview underpinned by a portfolio of evidence
K59: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Inspection and testing requirements and techniques.	Observation with questions

KNOWLEDGE	ASSESSMENT METHODS
K60: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Design specifications, plans, drawings and manufacturer's instructions.	Interview underpinned by a portfolio of evidence
K61: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Awareness of wiring regulations - purpose and importance.	Interview underpinned by a portfolio of evidence
K62: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Configuration and calibration procedures and requirements. Precision and tolerance.	Observation with questions
K63: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Round numbers, scientific notation, percentages and ratios. Area, perimeter, volume and surface area. Scales, tables, graphs and charts. Trigonometry and Pythagoras' Theorem. Engineering formulae. Sequence of operations. Conversions and calculations.	Multiple-choice test
K64: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Cable types and termination methods. Specification and application.	Interview underpinned by a portfolio of evidence
K65: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Telemetry signals and outstations configuration.	Interview underpinned by a portfolio of evidence
K66: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Software and logic used within the control system.	Interview underpinned by a portfolio of evidence
K67: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Data analysis and monitoring techniques.	Interview underpinned by a portfolio of evidence
SKILL	**ASSESSMENT METHODS**
S1: Core. Work in line with water industry standards and regulatory requirements.	Interview underpinned by a portfolio of evidence
S2: Core. Plan maintenance work, taking into consideration: process safety and following process risk assessments; the impact work has on the environment and on water treatment or wastewater recycling.	Interview underpinned by a portfolio of evidence

KNOWLEDGE	ASSESSMENT METHODS
S3: Core. Identify, organise and use resources to complete tasks, with consideration for process, cost, quality, safety, security and environmental impact.	Observation with questions
S4: Core. Follow health and safety procedures and safe systems of work in compliance with regulations and standards, including PPE.	Observation with questions
S5: Core. Follow sustainability principles. Segregate waste for recycling, reuse or disposal.	Interview underpinned by a portfolio of evidence
S6: Core. Select, check store and maintain equipment and tools.	Interview underpinned by a portfolio of evidence
S7: Core. Restore the work area on completion of the activity.	Observation with questions
S8: Core. Communicate in writing and record or enter information - paper based or electronic. For example, job sheets, risk assessments, equipment service records, test results, handover documents and manufacturers' documentation, asset management records, work sheets, checklists, waste environmental records and legal reporting requirements.	Observation with questions
S9: Core. Collect, interpret and use data and information using information and digital technology. Comply with GDPR and cyber security regulations and policies.	Interview underpinned by a portfolio of evidence
S10: Core. Apply equity, diversity and inclusion policies and practices.	Interview underpinned by a portfolio of evidence
S11: Core. Apply teamworking principles.	Interview underpinned by a portfolio of evidence
S12: Core. Apply continuous improvement techniques. Devise suggestions for improvement.	Interview underpinned by a portfolio of evidence
S13: Core. Communicate with and provide support, technical advice, work updates and information to technical and non-technical colleagues and other stakeholders.	Interview underpinned by a portfolio of evidence
S14: Core.	Interview underpinned by a portfolio of evidence

KNOWLEDGE	ASSESSMENT METHODS
Carry out and record learning and development activities.	
S15: Core. Follow security procedures. For example, site access, document classification, and securing assets.	Interview underpinned by a portfolio of evidence
S16: Water industry asset maintenance technician - mechanical. Mechanical: Complete commissioning and decommissioning for mechanical equipment.	Interview underpinned by a portfolio of evidence
S17: Water industry asset maintenance technician - mechanical. Mechanical: Assemble, position and install mechanical equipment or components.	Interview underpinned by a portfolio of evidence
S18: Water industry asset maintenance technician - mechanical. Mechanical: Disconnect and remove mechanical equipment or components.	Observation with questions
S19: Water industry asset maintenance technician - mechanical. Mechanical: Apply repair and maintenance practices and techniques.	Observation with questions
S20: Water industry asset maintenance technician - mechanical. Mechanical: Use tools, equipment and components for installation, repair and maintenance tasks.	Observation with questions
S21: Water industry asset maintenance technician - mechanical. Mechanical: Isolate plant and equipment in preparation for maintenance work, including permits, safe isolation policies, lock off systems and depressurisation of pressurised systems.	Observation with questions
S22: Water industry asset maintenance technician - mechanical. Mechanical: Inspect and test mechanical systems and components.	Observation with questions
S23: Water industry asset maintenance technician - mechanical. Mechanical: Carry out fault finding and rectification techniques using aids and diagnostic equipment.	Interview underpinned by a portfolio of evidence
S24: Water industry asset maintenance technician - mechanical. Mechanical: Carry out inspection and monitoring of mechanical systems and equipment.	Observation with questions
S25: Water industry asset maintenance technician - mechanical. Mechanical: Identify a problem, investigate problem to identify the underlying cause. Identify a solution.	Interview underpinned by a portfolio of evidence
S26: Water industry asset maintenance technician - mechanical.	Interview underpinned by a portfolio of evidence

KNOWLEDGE	ASSESSMENT METHODS
Mechanical: Use and interpret manufacturer's instructions, design specifications, plans and drawings.	
S27: Water industry asset maintenance technician - mechanical. Mechanical: Apply basic fabrication, welding and thermal cutting processes for mechanical components and structures.	Interview underpinned by a portfolio of evidence
S28: Water industry asset maintenance technician - mechanical. Mechanical: Apply bench fitting techniques.	Interview underpinned by a portfolio of evidence
S29: Water industry asset maintenance technician - mechanical. Mechanical: Use machinery. For example, lathes, pillar drills, milling machine, threading machine, mechanical saws.	Interview underpinned by a portfolio of evidence
S30: Water industry asset maintenance technician - mechanical. Mechanical: Use mechanical theories and principles.	Observation with questions
S31: Water industry asset maintenance technician - mechanical. Mechanical: Use mathematical theory.	Multiple-choice test
S32: Water industry asset maintenance technician - electrical. Electrical: Install, commission and decommission cabling and electrical equipment.	Interview underpinned by a portfolio of evidence
S33: Water industry asset maintenance technician - electrical. Electrical: Use electrical theories and principles.	Observation with questions
S34: Water industry asset maintenance technician - electrical. Electrical: Apply repair and maintenance practices and techniques.	Observation with questions
S35: Water industry asset maintenance technician - electrical. Electrical: Modify electrical circuits.	Interview underpinned by a portfolio of evidence
S36: Water industry asset maintenance technician - electrical. Electrical: Interrogate different types of intelligent control equipment. To include, PLCs, HMIs, Intelligent Starters, Variable Speed Drives (VSDs).	Interview underpinned by a portfolio of evidence
S37: Water industry asset maintenance technician - electrical. Electrical: Carry out fault finding and rectification techniques using aids and diagnostic equipment.	Interview underpinned by a portfolio of evidence
S38: Water industry asset maintenance technician - electrical. Electrical: Use tools, equipment and components for installation, repair and maintenance.	Observation with questions

KNOWLEDGE	ASSESSMENT METHODS
S39: Water industry asset maintenance technician - electrical. Electrical: Isolate equipment in preparation for maintenance work, including permits, safe isolation policies and lock off systems.	Observation with questions
S40: Water industry asset maintenance technician - electrical. Electrical: Inspect and test electrical installations and equipment.	Observation with questions
S41: Water industry asset maintenance technician - electrical. Electrical: Use electrical drawings.	Interview underpinned by a portfolio of evidence
S42: Water industry asset maintenance technician - electrical. Electrical: Install different cable types and terminate to their specifications and applications.	Interview underpinned by a portfolio of evidence
S43: Water industry asset maintenance technician - electrical. Electrical: Use mathematical theory.	Multiple-choice test
S44: Water industry asset maintenance technician - electrical. Electrical: Identify a problem, investigate problem to identify the underlying cause. Identify a solution.	Interview underpinned by a portfolio of evidence
S45: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Use electrical theories and principles.	Observation with questions
S46: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Install, commission and decommission ICA equipment.	Interview underpinned by a portfolio of evidence
S47: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Configure instrumentation and control devices.	Observation with questions
S48: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Calibrate and monitor open and closed loop systems.	Observation with questions
S49: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Use tools, equipment and components for installation, repair and maintenance.	Observation with questions
S50: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Configure field instrumentation, communication devices and equipment used in system and process control.	Interview underpinned by a portfolio of evidence

KNOWLEDGE	ASSESSMENT METHODS
S51: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Apply repair and maintenance practices and techniques to instrumentation and control equipment, control systems and cabling.	Observation with questions
S52: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Carry out fault finding techniques for instrumentation and control equipment. Use diagnostic equipment.	Interview underpinned by a portfolio of evidence
S53: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Inspect and test ICA equipment.	Observation with questions
S54: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Use and interpret design specifications, plans, drawings and manufacturer's instructions.	Interview underpinned by a portfolio of evidence
S55: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Calibrate ICA equipment.	Observation with questions
S56: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Use mathematical theory.	Multiple-choice test
S57: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Isolate equipment in preparation for maintenance work, including permits, safe isolation policies and lock off systems.	Observation with questions
S58: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Install different cable types and terminate to their specifications and applications.	Interview underpinned by a portfolio of evidence
S59: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Test telemetry signals and configure outstations.	Interview underpinned by a portfolio of evidence
S60: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Use software to produce programs to be used within the control system.	Interview underpinned by a portfolio of evidence
S61: Water industry asset maintenance technician - instrumentation, control and automation.	Observation with questions

KNOWLEDGE	ASSESSMENT METHODS
ICA: Assess condition of equipment. Identify action required.	
S62: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Identify a problem, investigate problem to identify the underlying cause. Identify a solution.	Interview underpinned by a portfolio of evidence
S63: Water industry asset maintenance technician - instrumentation, control and automation. ICA: Analyse and monitor data to make evidence based changes if required.	Interview underpinned by a portfolio of evidence
BEHAVIOUR	**ASSESSMENT METHODS**
B1: Core. Take responsibility for and proactively promote health and safety for self, others, site and assets.	Observation with questions
B2: Core. Considers the environment and sustainability.	Interview underpinned by a portfolio of evidence
B3: Core. Seek to improve ways of working.	Interview underpinned by a portfolio of evidence
B4: Core. Promote inclusivity in the workplace with colleagues, stakeholders, and customers.	Interview underpinned by a portfolio of evidence
B5: Core. Collaborate and promote teamwork across disciplines.	Interview underpinned by a portfolio of evidence
B6: Core. Proactively identifies issues and takes responsibility for actions.	Interview underpinned by a portfolio of evidence
B7: Core. Committed to maintaining and enhancing competence of self and others through Continued Professional Development (CPD).	Interview underpinned by a portfolio of evidence

Mapping of KSBs to grade themes

Edit add grade themes formEdit mapping of ksbs to grade themes form

Observation with questions

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
(Core) Prepare for work S3	None	Identify, organise and use resources to complete tasks, with consideration for process, cost, quality, safety, security and	None

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
		environmental impact. (S3)	
(Core) Health and safety K7 S4 S7 B1	Safe systems of work. (K7)	Follow health and safety procedures and safe systems of work in compliance with regulations and standards, including PPE. (S4) Restore the work area on completion of the activity. (S7)	Take responsibility for and proactively promote health and safety for self, others, site and assets. (B1)
(Core) Documentation and written communication K15 S8	Written communication and documentation: methods and requirements - electronic and paper. Service records. Test results. (K15)	Communicate in writing and record or enter information - paper based or electronic. For example, job sheets, risk assessments, equipment service records, test results, handover documents and manufacturers' documentation, asset management records, work sheets, checklists, waste environmental records and legal reporting requirements. (S8)	None
(Water industry asset maintenance technician - mechanical) Repair or maintenance K24 K26 K27 K29 S18 S19 S20 S21 S22 S24 S30	Mechanical: Safe isolation and depressurisation of mechanical plant and equipment in preparation for repair and maintenance work. Permits, safe isolation policies, lock off systems. (K24) Mechanical: Repair and maintenance of machinery, equipment and components. Practices and techniques. Removing and replacing parts, set up, adjustment, cleaning and lubricating. (K26)	Mechanical: Disconnect and remove mechanical equipment or components. (S18) Mechanical: Apply repair and maintenance practices and techniques. (S19) Mechanical: Use tools, equipment and components for installation, repair and maintenance tasks. (S20) Mechanical: Isolate plant and equipment in preparation for maintenance work, including permits, safe isolation policies, lock off systems and	None

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
	Mechanical: Tools, equipment and components used for the installation, repair and maintenance of mechanical systems. Application, operation, care and calibration requirements. (K27) Mechanical: Inspection, monitoring and testing requirements and techniques. (K29)	depressurisation of pressurised systems. (S21) Mechanical: Inspect and test mechanical systems and components. (S22) Mechanical: Carry out inspection and monitoring of mechanical systems and equipment. (S24) Mechanical: Use mechanical theories and principles. (S30)	
(Water industry asset maintenance technician - electrical) Repair or maintenance K38 K42 K44 K45 S33 S34 S38 S39 S40	Electrical: Safe isolation of plant and electrical equipment in preparation for repair and maintenance work. Permits, safe isolation policies, lock off systems. (K38) Electrical: Tools, equipment and components used for the installation, repair and maintenance of electrical systems. Application, operation, care and calibration requirements. (K42) Electrical: Inspection and testing requirements and techniques. (K44) Electrical - Repair and maintenance of equipment and components. Practices and techniques. Removing and replacing parts. (K45)	Electrical: Use electrical theories and principles. (S33) Electrical: Apply repair and maintenance practices and techniques. (S34) Electrical: Use tools, equipment and components for installation, repair and maintenance. (S38) Electrical: Isolate equipment in preparation for maintenance work, including permits, safe isolation policies and lock off systems. (S39) Electrical: Inspect and test electrical installations and equipment. (S40)	None

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
(Water industry asset maintenance technician - instrumentation, control and automation) Configure and calibrate K54 K62 S47 S48 S55	ICA: Open and closed loop systems. First and second order control systems. (K54) ICA: Configuration and calibration procedures and requirements. Precision and tolerance. (K62)	ICA: Configure instrumentation and control devices. (S47) ICA: Calibrate and monitor open and closed loop systems. (S48) ICA: Calibrate ICA equipment. (S55)	None
(Water industry asset maintenance technician - instrumentation, control and automation) Repair or maintenance K52 K55 K56 K59 S45 S49 S51 S53 S57 S61	ICA: Repair and maintenance of instruments, controllers, sensors, probes, attachments, cabling, meters and display units. Practices and techniques. (K52) ICA: Safe isolation of plant and ICA equipment in preparation for repair and maintenance work. Permits, safe isolation policies, lock off systems. (K55) ICA: Tools, equipment and components used for the installation, repair and maintenance of control systems. Application, operation, care and calibration requirements. (K56) ICA: Inspection and testing requirements and techniques. (K59)	ICA: Use electrical theories and principles. (S45) ICA: Use tools, equipment and components for installation, repair and maintenance. (S49) ICA: Apply repair and maintenance practices and techniques to instrumentation and control equipment, control systems and cabling. (S51) ICA: Inspect and test ICA equipment. (S53) ICA: Isolate equipment in preparation for maintenance work, including permits, safe isolation policies and lock off systems. (S57) ICA: Assess condition of equipment. Identify action required. (S61)	None

Interview underpinned by a portfolio of evidence

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
(Core) Role, responsibilities and requirements	Awareness of water industry legislative and regulatory requirements.	Work in line with water industry standards and	None

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
K2 K5 S1	Materials in contact (WRAS approved), food grade lubricants. (K2) Water industry maintenance technician role, responsibilities, limits of autonomy and reporting channels. (K5)	regulatory requirements. (S1)	
(Core) Planning for work K11 K13 K14 S2 S6	Planning, prioritising, work scheduling and time management approaches. (K11) Tools and equipment used in maintenance and repair tasks. Operational checks, calibration, storage and maintenance requirements. (K13) Maintenance strategies and techniques: planned, preventative, predictive and reactive methods and their frequency. (K14)	Plan maintenance work, taking into consideration: process safety and following process risk assessments; the impact work has on the environment and on water treatment or wastewater recycling. (S2) Select, check store and maintain equipment and tools. (S6)	None
(Core) Health, safety, security, environment and sustainability K8 K10 K12 K16 K17 S5 S15 B2 B6	Dangerous Substances and Explosive Atmospheres Regulations (DSEAR). ATEX compliance (safety requirements of the workplace and equipment used in explosive atmospheres). Working in and around explosive atmospheres. Hazardous areas (DSEAR zones). PPE. Intrinsically safe tools for working in explosive atmospheres. Exposure limits. Necessary forced pre-ventilation. Gas monitoring equipment. (K8) The impact water industry operations have	Follow sustainability principles. Segregate waste for recycling, reuse or disposal. (S5) Follow security procedures. For example, site access, document classification, and securing assets. (S15)	Considers the environment and sustainability. (B2) Proactively identifies issues and takes responsibility for actions. (B6)

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
	on the environment. (K10) Asset security requirements. (K12) Personal hygiene risks and requirements for working on a water treatment or a wastewater treatment site. (K16) Water industry process safety and process risk assessments. Incidents and emergency situations (internal and external): pollution, loss of process, security, weather, and accidents: their potential impact. Incident management and procedures. The risk of pollution and untreated water in supply. (K17)		
(Core) Continual improvement and CPD K18 S12 S14 B3 B7	Continuous improvement techniques. Asset and process optimisation. (K18)	Apply continuous improvement techniques. Devise suggestions for improvement. (S12) Carry out and record learning and development activities. (S14)	Seek to improve ways of working. (B3) Committed to maintaining and enhancing competence of self and others through Continued Professional Development (CPD). (B7)
(Core) Equity and diversity K19 S10 B4	Principles of equity, diversity, and inclusion in the workplace. Unconscious bias. (K19)	Apply equity, diversity and inclusion policies and practices. (S10)	Promote inclusivity in the workplace with colleagues, stakeholders, and customers. (B4)
(Core) Team working and communication	Team working principles. (K20)	Apply teamworking principles. (S11)	Collaborate and promote

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
K20 K21 S11 S13 B5	Non-written communication methods and techniques. Engineering maintenance terminology. (K21)	Communicate with and provide support, technical advice, work updates and information to technical and non-technical colleagues and other stakeholders. (S13)	teamwork across disciplines. (B5)
(Core) ICT and digital K22 S9	Information technology and digital: digital interfaces, email, Management Information Systems (MIS), spreadsheets, presentation, word processing, virtual communication, learning platforms, work collaboration platforms. General Data Protection Regulation (GDPR). Cyber security. (K22)	Collect, interpret and use data and information using information and digital technology. Comply with GDPR and cyber security regulations and policies. (S9)	None
(Water industry asset maintenance technician - mechanical) Installation, commissioning and decommissioning K25 S16	Mechanical: Practices and techniques for the installation, commissioning and decommissioning of mechanical systems and equipment. (K25)	Mechanical: Complete commissioning and decommissioning for mechanical equipment. (S16)	None
(Water industry asset maintenance technician - mechanical) Repair or maintenance K30 K31 K33 S17 S26 S27 S28 S29	Mechanical: Basic fabrication, welding and thermal cutting processes for mechanical components and structures. (K30) Mechanical: Bench fitting techniques. (K31) Mechanical: Design specifications, plans, drawings and manufacturer's instructions. (K33)	Mechanical: Assemble, position and install mechanical equipment or components. (S17) Mechanical: Use and interpret manufacturer's instructions, design specifications, plans and drawings. (S26) Mechanical: Apply basic fabrication, welding and thermal cutting processes for mechanical	None

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
		components and structures. (S27) Mechanical: Apply bench fitting techniques. (S28) Mechanical: Use machinery. For example, lathes, pillar drills, milling machine, threading machine, mechanical saws. (S29)	
(Water industry asset maintenance technician - mechanical) Fault finding and problem solving K28 S23 S25	Mechanical: Fault finding, problem solving and rectification techniques. Aids and diagnostic equipment. (K28)	Mechanical: Carry out fault finding and rectification techniques using aids and diagnostic equipment. (S23) Mechanical: Identify a problem, investigate problem to identify the underlying cause. Identify a solution. (S25)	None
(Water industry asset maintenance technician - electrical) Installation, commissioning and decommissioning K35 K37 K39 K40 K43 K46 K48 S32 S35 S36 S41 S42	Electrical: Practices and techniques for the installation, commissioning and decommissioning of cabling and electrical equipment. (K35) Electrical: Design and modification of electrical circuits. (K37) Electrical - Types of intelligent control equipment. PLCs, HMIs, Intelligent starters, Variable Speed Drives (VSDs). (K39) Electrical - Basic telemetry signals and outstations. (K40) Electrical: Design specifications, plans,	Electrical: Install, commission and decommission cabling and electrical equipment. (S32) Electrical: Modify electrical circuits. (S35) Electrical: Interrogate different types of intelligent control equipment. To include, PLCs, HMIs, Intelligent Starters, Variable Speed Drives (VSDs). (S36) Electrical: Use electrical drawings. (S41) Electrical: Install different cable types	None

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
	drawings and manufacturer's instructions. (K43) Electrical: Awareness of wiring regulations - purpose and importance. (K46) Electrical - Cable types and termination methods. Specifications and application. (K48)	and terminate to their specifications and applications. (S42)	
(Water industry asset maintenance technician - electrical) Fault finding and problem solving K41 S37 S44	Electrical - Fault finding, problem solving and rectification techniques, aids and diagnostic equipment. (K41)	Electrical: Carry out fault finding and rectification techniques using aids and diagnostic equipment. (S37) Electrical: Identify a problem, investigate problem to identify the underlying cause. Identify a solution. (S44)	None
(Water industry asset maintenance technician - instrumentation, control and automation) Installation, commissioning and decommissioning K51 K60 K61 K64 S46 S54 S58	ICA: Practices and techniques for the installation, commissioning and decommissioning of ICA equipment. (K51) ICA: Design specifications, plans, drawings and manufacturer's instructions. (K60) ICA: Awareness of wiring regulations - purpose and importance. (K61) ICA: Cable types and termination methods. Specification and application. (K64)	ICA: Install, commission and decommission ICA equipment. (S46) ICA: Use and interpret design specifications, plans, drawings and manufacturer's instructions. (S54) ICA: Install different cable types and terminate to their specifications and applications. (S58)	None
(Water industry asset maintenance technician -	ICA: Field instrumentation, communication devices	ICA: Configure field instrumentation, communication	None

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
instrumentation, control and automation) Calibration, configuration and software K57 K65 K66 K67 S50 S59 S60 S63	and equipment used in system and process control. To include: Human Machine Interfaces (HMIs), Programmable Logic Controllers (PLC), Supervisory Control and Data Acquisition (SCADA) systems, back up procedures. Configuration procedures and requirements. (K57) ICA: Telemetry signals and outstations configuration. (K65) ICA: Software and logic used within the control system. (K66) ICA: Data analysis and monitoring techniques. (K67)	devices and equipment used in system and process control. (S50) ICA: Test telemetry signals and configure outstations. (S59) ICA: Use software to produce programs to be used within the control system. (S60) ICA: Analyse and monitor data to make evidence based changes if required. (S63)	
(Water industry asset maintenance technician - instrumentation, control and automation) Fault finding and problem solving K58 S52 S62	ICA: Fault finding, problem solving and rectification techniques. Aids and diagnostic equipment. (K58)	ICA: Carry out fault finding techniques for instrumentation and control equipment. Use diagnostic equipment. (S52) ICA: Identify a problem, investigate problem to identify the underlying cause. Identify a solution. (S62)	None

Supporting information

External quality assurance

Edit external quality assurance - eqa form

Option selected: Ofqual

Involved employers

Severn Trent, Wessex Water, Thames Water, Yorkshire Water, Anglian Water, Southern Water, United Utilities, Southeast Water, Severn Trent Water

EPA menu