OTHM LEVEL 6 / UNIT 05

Maintaining a Safe Working Environment

A professional learning companion

Understand the conditions. Examine the evidence.
Make decisions that protect people.

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Complete unit companion · September 2026

A book to study, question and use

Independent DB HSE teaching resource for the OTHM Level 6 Diploma in Occupational Health and Safety.

Prepared by Debjyoti Biswas, FIIRSM, CertIOSH. Edition dated 24 September 2026. This is not an OTHM publication or endorsement. The official specification and current centre-issued assessment brief remain the authoritative assessment documents.

> Five learning outcomes · 26 assessment criteria · Evidence-based practice

How this edition is organised

The book covers all five learning outcomes and 26 assessment criteria. Each section connects technical concepts with workplace evidence, professional judgement, practice activities and assessment preparation. Read the chapters in sequence or use the contents and requirement map to revisit a particular topic.

All Northstar information is fictional teaching data. All newly generated workplace scenes are learning prompts, not evidence of real organisational performance.

UK legal examples mainly concern Great Britain, with fire-law differences identified. Apply the law and specialist guidance relevant to your actual workplace. Technical learning does not authorise specialist electrical, structural, radiation, lifting, asbestos or confined-space work.

Source references such as [W1] are linked to primary guidance. The reference directory provides document titles and links. The LO/AC map preserves assessment wording from the supplied brief, checked against the December 2023 specification; the IC column explains the topics, with links to the original official text.

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From the author

FROM THE AUTHOR

"The strongest professional voice is your own voice, supported by reliable evidence."

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A familiar workplace can conceal unfamiliar risks. People recognise its routines, equipment and colleagues, yet a change in workload, layout, maintenance or staffing can alter the conditions that protect them. Maintaining a safe working environment requires you to question those conditions and judge whether they remain suitable for the work being done.

This book builds on your prior health and safety learning and professional experience. Its purpose is to strengthen the connection between technical understanding and defensible judgement. Essential terms are defined at the point of use so that you can examine their precise meaning, distinguish related concepts and apply them consistently. Familiarity is a useful starting point; reliable evidence is the basis for a conclusion.

Across five sections, you will examine the workplace itself, particular work activities and physical agents, fire and explosion, hazardous substances, and equipment. These are connected parts of one working system. A new process can change ventilation needs, introduce ignition sources, affect escape routes and place additional demands on a building or its equipment. The task is to understand these relationships, identify the evidence that matters and recognise when specialist advice is necessary.

The book develops your ability to explain your reasoning clearly. Move beyond recording that an assessment or procedure exists: examine whether it describes the actual work, whether its controls operate in practice and what evidence supports your judgement. That ability matters when preparing an assignment, advising management and challenging an arrangement that may leave people exposed to harm.

Read actively and test the examples against your own professional knowledge. Complete each activity before reviewing the discussion, record uncertainties and consult the cited sources. Where your assessment brief permits workplace evidence, use an appropriate organisational context and protect confidential information. The fictional Northstar examples demonstrate reasoning; they should not be presented as events you have personally observed.

Use the book as a reference to return to when a condition changes or an assumption needs checking. Its central question remains the same: what protects people in this working environment, and how can you establish that the protection is suitable and effective? The strongest professional voice is your own voice, supported by reliable evidence.

Debjyoti Biswas, FIIRSM, CertIOSH DB HSE International

Start here | Why this unit matters

A safe working environment depends on suitable conditions and continued verification. What must a workplace provide, and what evidence is needed to establish that people remain protected as tasks, equipment and circumstances change? Unit 5 examines the conditions in which work takes place. It connects the workplace as a whole with the individual factors that can support or undermine health and safety.

Here, working environment means the physical surroundings and conditions in which people perform their tasks: the building, layout, air, temperature, light, routes, welfare facilities, equipment and substances. These conditions must be examined together with the people using them and the way work is organised. In this unit, environment does not mean only pollution or the natural environment. A workplace can look tidy while its lighting is unsuitable for a detailed task, its washing facilities are unavailable on a night shift, or a change in loading has not been assessed. HSE similarly considers healthy conditions, welfare facilities and the safety of premises together. [W5]

What maintaining a safe working environment means

Maintaining means keeping conditions suitable over time, not simply making an improvement once. Ask what the task requires, examine the present conditions, identify who could be harmed and how, evaluate the controls, act on shortcomings, and check again when something changes. An inspection is a structured examination of conditions; an assessment is the reasoned interpretation of what those conditions mean. Neither a completed checklist nor a quiet accident record answers every question about current protection.

Health and safety belong in the same discussion. Some events cause an immediate injury, while other exposures may cause harm after repeated or prolonged contact. The same workplace feature can affect both. The assessment question is therefore wider than whether an accident could occur. It includes how the conditions affect people doing the work and what evidence would show that their protection is suitable.

What you should be able to do by the end

By completing the learning and developing your own assignment evidence, you should be able to explain the unit's technical ideas, apply them to a workplace and justify a professional judgement. The following capabilities describe the teaching purpose; the official LO and AC remain the assessment requirements. Successful assessment depends on demonstrating those requirements, not on attendance or reading alone. [O1]

Learning area	Knowledge you build	What you should be able to demonstrate
Section 1: working environment	How conditions, welfare, electricity and building integrity affect people	Examine an actual workplace, explain the hazard mechanisms and evaluate whether arrangements suit the work and workforce
Section 2: workplace contexts	Why tasks, locations, noise, vibration and radiation need different controls	Compare controls with the particular activity and exposure, and explain the evidence and specialist input needed
Section 3: fire and explosion	How ignition, spread, protection and escape interact	Explain a connected prevention and emergency strategy, including its limitations
Section 4: hazardous substances	How harmful agents are identified, reach people and are controlled	Follow the path from source to exposure, justify controls and examine their performance
Section 5: equipment and machinery	How selection, safeguards, maintenance and use affect safety throughout equipment life	Evaluate equipment for its real tasks, including abnormal work, and recognise when competent technical assessment is needed

Connect study, professional practice and assessment

> The examples and activities develop a disciplined approach to observation, questioning and professional judgement. In an assignment, demonstrate that reasoning through relevant evidence, an appropriate source, a clear explanation and a justified conclusion. For example, “the workbench has lighting” is a description. Explaining whether that lighting allows the actual task to be performed, what observations support your view and what remains uncertain develops the analysis. Follow each criterion's command word and your current centre-issued brief; these examples are learning guidance, not additional assessment rules.

The professional benefit is a more disciplined way to recognise a problem, explain its significance, select a proportionate response and check whether that response works. Knowing when you need a competent electrician, structural engineer, occupational hygienist or other specialist is part of that judgement. The unit develops your ability to evaluate and coordinate safety arrangements; it does not replace specialist competence.

Why the learning begins with temperature and lighting

The unit begins with the ordinary conditions surrounding a task because they are easy to take for granted. A worker needs to see, move, reach, use facilities and work in suitable conditions before more specialised controls can be evaluated properly. Temperature is an accessible first example of the relationship between the task, the surroundings and the person. Its place at the start is a teaching sequence, not a claim that it is always the most urgent risk. Actual priorities depend on the hazards and exposures found in the workplace.

The sequence then broadens: everyday conditions and welfare; electrical and structural integrity; task-specific hazards and physical agents; fire and explosion; hazardous substances; and equipment. The sections overlap in practice. A workplace change can affect several of them at once. Keep returning to one question: what has changed for the person doing the work, and what evidence will show that the protection still works?

Begin with a familiar place

Choose one workplace or work area you know. Describe the task and the people involved before listing hazards. Ask: what must people be able to see, reach, move through and use? What supplies energy to the work? What supports the loads? What could change across shifts or during maintenance? Keep these questions beside you as you study. This establishes a practical reason to investigate temperature, lighting, welfare, electricity and structure as connected features of work.

How to use this book

This independently prepared professional learning companion addresses Unit R/617/9092 of the OTHM Level 6 Diploma in Occupational Health and Safety. The December 2023 specification identifies the unit as Level 6, with 12 credits, 120 hours total qualification time and 40 guided learning hours. This book uses that specification as its curriculum reference; consult your current centre-issued brief for assessment arrangements. The qualification structure uses “Safe Workplace Environment”, while the unit heading uses “Safe Working Environment”. Both refer to R/617/9092. [O1]

The book covers all five learning outcomes and 26 assessment criteria. It is designed for structured study and later professional reference: read the connected explanations, examine the examples, attempt the activities and use the requirement map to check your coverage. Assessment decisions remain with the centre and awarding organisation. Use your current centre-issued brief for submission arrangements and permitted organisational context.

Each chapter distinguishes concepts, practical judgement and evidence. A hazard is something with the potential to cause harm. Risk concerns the likelihood and severity of that harm in a particular situation. A control is an arrangement that prevents exposure or reduces its consequences. Residual risk is the risk that remains after controls operate. These words are connected, but they are not interchangeable.

UK legislation provides the worked legal context, principally Great Britain. Fire legislation differs between England and Wales, Scotland and Northern Ireland. Outside Great Britain, identify the applicable local law and regulator; do not present British requirements as universal. HSE guidance explains recognised practice. The book’s suggested checklists, priorities and fictional examples are teaching recommendations, not additional legal requirements.

Some tasks require specialist competence: electrical work, structural assessment, asbestos work, confined-space entry, radiation protection and the design of lifting or explosion-protection systems. Reading a chapter does not authorise someone to perform them. Your management role includes recognising the boundary of your competence, securing the area where necessary, and arranging suitably qualified support.

Read, question, apply: a learning routine

Use a Cornell-style notebook with a narrow question column, a wider evidence column and a short summary at the bottom. In the question column write prompts such as “Why does this control work?” or “What would invalidate this measurement?” In the evidence column record the explanation, source, workplace observation and any uncertainty. Finish with three sentences: what you understand, what you would change, and what you still need to verify. This is a study method, not an OTHM assessment requirement.

When reading a table, start with its purpose. Identify what each row represents and what the column headings mean. Check units, dates, the source and missing information before comparing values. Distinguish a recorded fact from an assumption and a proposed action. A green cell is not evidence; a dated observation with a clear method may be. A calculated score is a decision aid, not permission to ignore a serious hazard.

For every control, ask four questions: what failure does it prevent; under what conditions does it work; how can it fail; and who checks that it remains effective? Apply these questions to a floor-cleaning arrangement, an electrical isolator, a fire door or a lifting plan. They provide a consistent way of thinking across the whole unit.

Northstar: our continuing workplace case

Northstar Distribution and Chemicals is fictional. Every Northstar person, event, measurement, cost and quantity in this book is invented teaching data. The organisation operates a warehouse, small chemical-decanting room, maintenance workshop, offices and a shared delivery yard. It uses agency labour, contractors and two shifts. A planned mezzanine and a growing product range create change-management questions.

In the fictional starting position, workers report glare at the labelling bench, water carried into an entrance during rain, a washroom that is difficult for one worker to access, several damaged flexible cables, and a rack upright struck by a vehicle. The site manager wants production to continue. Our task is not to declare the entire site safe or unsafe from this short description. It is to identify immediate protective action, determine what evidence is missing and decide who is competent to assess it.

Keep an evidence ledger. Record the issue, location, people exposed, existing protection, evidence quality, immediate action, responsible owner, completion date and effectiveness check. Later chapters add noise, fire, substances and machinery evidence. This creates a connected management account rather than five disconnected assignments.

01

MAINTAINING A SAFE WORKING ENVIRONMENT

Understand. Examine. Apply. Reflect.

Section 1 | The working environment

LEARNING OUTCOME 1

Understand the range of factors to consider to maintain a safe work environment.

Why this section matters: Section 1 examines the place in which work happens. A task relies on more than a written procedure: people need suitable conditions, usable facilities, dependable electrical arrangements and a building that remains appropriate for its use. Section 1 teaches you to look at those foundations systematically. Start by understanding the activity and the people involved, then examine how the surroundings help or hinder safe and healthy work. The section progresses from workplace conditions and welfare to electrical and structural hazards and controls. The order helps you build an assessment; it does not set the priority of risks at your workplace.

What this section prepares you to do: By the end of this section, you should be able to outline important environmental factors, justify welfare provision, explain electrical and structural hazards, and use evidence to evaluate the associated controls. You should also recognise the limits of a visual inspection and identify where specialist assessment is needed.

Next reading: Begin with AC 1.1: what conditions must the workplace provide for the actual task and the people performing it?

AC 1.1 | Conditions that allow people to work safely

Official AC 1.1: Outline the critical factors when maintaining the working environment, ie temperature, light, space, ergonomics, lifts, access.

Why this criterion matters: Before asking whether people follow a procedure, ask whether the surroundings allow them to do the task safely and without avoidable harm. Temperature, lighting, space, ergonomics, lifts and access are connected conditions of work. This starting point helps you examine the workplace from the worker's point of view and recognise the environment as an active influence on exposure and safe performance. [W1, W5]

What you are learning to do: You should be able to outline each factor, explain its relationship to the task and identify suitable evidence. The aim is to connect a condition to its practical significance, not simply name six items.

What this criterion asks

Purpose: Start by understanding the decision behind the command word. This turns the official wording into a practical question you can investigate before deciding what evidence to collect.

Outline means give a clear, organised account of the main features. It does not mean list six words without explaining them. Address temperature, light, space, ergonomics, lifts and access, then show how they interact with the task and the people doing it. An effective outline links each factor to a foreseeable consequence and a practical way of maintaining suitable conditions.

The working environment is more than a room. It includes air, surfaces, routes, fixtures, the arrangement of equipment and the changing conditions of work. A workplace can meet its original design assumptions and become unsuitable when staffing, storage, machinery or working hours change. Maintaining it is a continuing process of checking, correcting and learning. In Great Britain, the Workplace (Health, Safety and Welfare) Regulations cover many ordinary workplaces, with exclusions and additional

sector-specific provisions. HSE L24 distinguishes the regulations, the Approved Code of Practice and guidance. [W1]

Temperature and ventilation should suit the work and the people doing it. Observation: What evidence would help establish whether conditions are comfortable?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Temperature and thermal comfort

Purpose: Why begin with temperature? People experience the conditions around them while performing a task. This topic illustrates how the surroundings, workload and clothing interact, and why one thermometer reading cannot describe the whole experience. [W6]

Thermal comfort is a person's experience of the thermal environment. Air temperature matters, but so do radiant heat, humidity, air movement, clothing and work rate. A wall thermometer alone cannot describe the burden on a worker wearing protective clothing beside a hot process. Cold can affect dexterity and concentration; excessive heat can create discomfort and, in more severe conditions, heat-related illness. Assess the work and the people rather than interpreting one number as a universal safe boundary. [W2]

HSE guidance normally describes at least 16°C for indoor workrooms, or 13°C for work involving rigorous physical effort. These are guidance values, not universal maximum or minimum legal limits for every situation. There is no single maximum workplace temperature applicable to all tasks. The legal requirement is a reasonable indoor temperature, with risk assessment and appropriate controls. Special activities may require different arrangements. [W2]

Begin by locating heat and cold sources and identifying tasks, duration and clothing. Consult workers on different shifts. Measure representative conditions, including the worst credible operating periods, and record where, when and how measurements were taken. Consider isolating heat sources, improving ventilation, providing suitable local heating or cooling and modifying the process. Work-rest arrangements, access to drinking water and acclimatisation may support control, but should not conceal an avoidable source problem.

Ventilation means replacing stale indoor air with appropriate fresh air. It can improve general air quality, but general ventilation is not automatically sufficient to control a hazardous emission at source. A fan that moves contaminated air across another worker can make the situation worse. Local exhaust ventilation captures contaminants near where they arise; Section 4 develops that distinction. Check that changes to airflow do not compromise fire arrangements or introduce an additional exposure. [W3, C2]

Good lighting supports accurate work and helps workers see hazards. Observation: Where could shadows or glare affect this task?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Lighting: enough light, in the right place

Purpose: Lighting assessment begins by establishing what people need to see to perform the task safely. The purpose is to connect lighting with the work surface, objects, routes and potential hazards, before considering readings or improvements. [W4]

Illuminance is the amount of light reaching a surface, usually expressed in lux. The relevant surface is the task plane: for example, the label being read rather than an arbitrary point in the room. Consider the visual detail, contrast, glare, shadows, colour recognition and transitions between bright and darker areas. A lux reading does not tell you whether a reflective label is legible or whether a machine’s rotating parts create a misleading visual effect. [W4]

Start with the task. Observe it during normal production and maintenance. Ask whether users can see small print, moving equipment, changes in floor level and emergency information. Compare findings with appropriate guidance and design specifications.

Maintain fittings and clean diffusers; replace failed lamps promptly. Where failure of normal lighting would expose people to danger, suitable emergency lighting is part of the overall arrangements. A portable lamp is not a substitute for an assessed system.

At Northstar, fictional observations show that the bench is brightly illuminated but workers tilt labels to avoid reflected glare. Adding more light without changing the angle could worsen the problem. A trial of diffuse task lighting and altered bench orientation is a better first investigation. The judgement should consider task accuracy, worker feedback and repeated observations after the change, not just whether the room appears brighter.

Routes and workspaces need enough room for safe movement and access. Observation: What might compromise access along this route?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Space, movement and accessibility

Purpose: Seeing the task is only part of the picture; people must also have usable room to perform it and move around. This topic helps you distinguish the size of a room from the suitability of its actual layout. [W1]

Space must allow the work, movement, maintenance and emergency escape to happen safely. Gross floor area is not the same as usable working space. Stock, furniture, doors, moving equipment and temporary tasks occupy it. HSE L24 provides guidance on room dimensions, including a normal minimum volume of 11 cubic metres per person calculated with a maximum counted height of 3 metres, subject to its scope and qualifications. That figure is not a complete occupancy or fire-capacity assessment. [W1]

For teaching, consider a fictional room measuring 5 m by 4 m by 3 m: its volume is 60 m^3. Dividing by 11 gives approximately 5.45. This arithmetic does not approve five people working there. Furniture, circulation, the task, ventilation, access needs and escape requirements must still be assessed. A capacity calculator should reveal this limitation instead of presenting a “compliant” badge.

Accessibility means people can use the workplace and its facilities, including people with disabilities. Consult the person about their needs without assuming incapacity. Consider door widths, opening forces, floor levels, rest opportunities, signs and emergency arrangements. A clear route during an inspection may become obstructed during deliveries. Observe the busiest periods and assign ownership for keeping routes usable.

Adjusting work height and reach can reduce strain during repetitive tasks. Observation: Which adjustments could make this task more comfortable?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Ergonomics and lifts

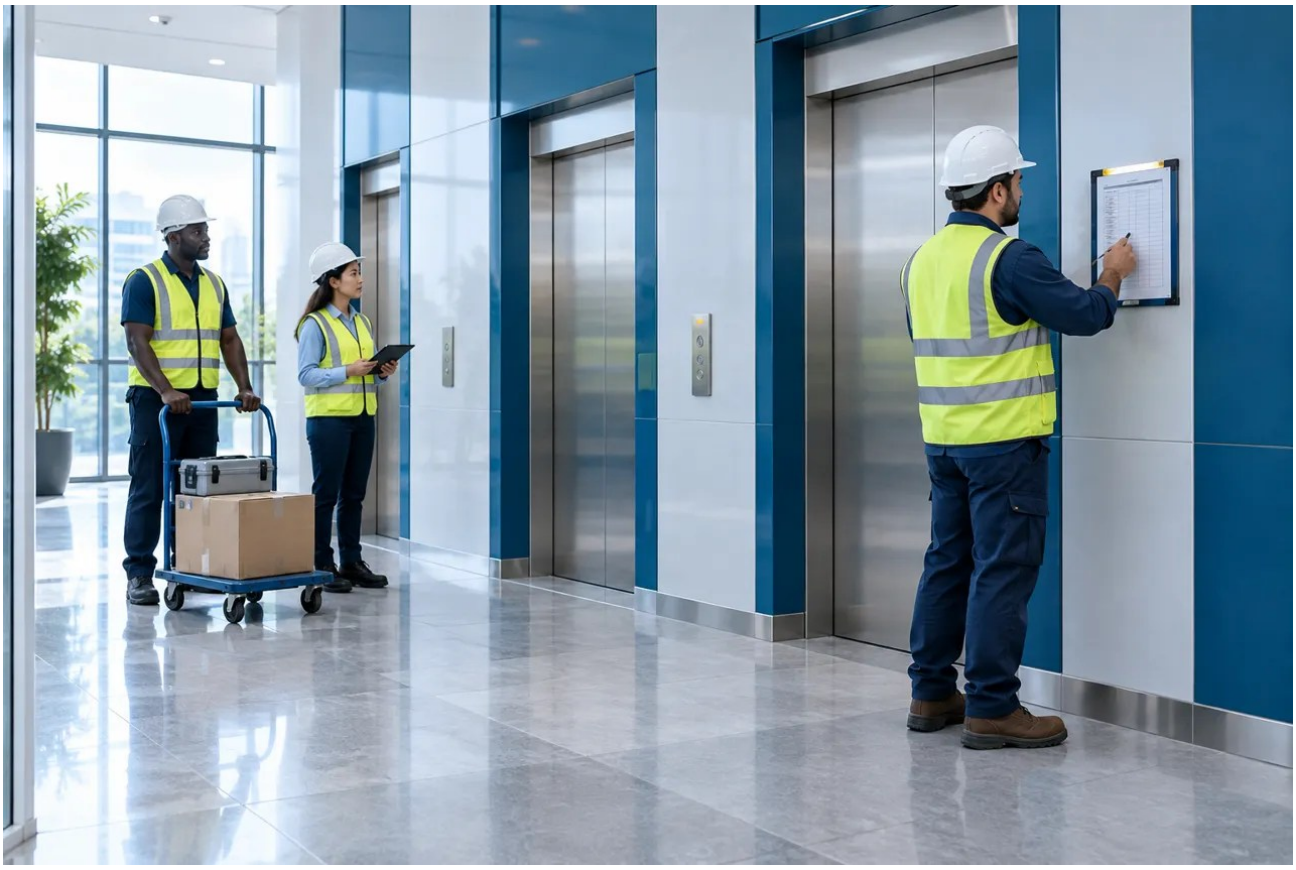
Purpose: Now consider how people interact with the workplace. Ergonomics asks how work fits the person; lifts raise separate questions about moving people or loads safely. Both require attention to the real use of the arrangement, rather than its mere presence. [E1]

Ergonomics is fitting work to people, including their physical and cognitive capabilities. Anthropometry concerns human body dimensions. Neither concept is limited to an office chair. Reaching, gripping, repetition, load handling, visibility, controls, pace and decision demands all matter. Adjustability often helps accommodate different users, but adjustments must be understandable and the work must permit people to use them. [E1]

A practical review observes the complete work cycle, asks workers where discomfort or difficulty occurs, and assesses force, posture, repetition and duration. Trial improvements with users. Raising a bench may reduce bending for one worker and create shoulder elevation for another. Job rotation only reduces exposure when the

alternative task changes the relevant demand; rotating between two similarly demanding jobs may not help.

Passenger and goods lifts support access and material movement but introduce crushing, trapping, falls, entrapment and maintenance risks. Check suitability, load limits, door protection, examination and maintenance arrangements, fault reporting and emergency communication. Do not improvise recovery of trapped people. Lifting people carries additional considerations. The applicable LOLER arrangements and competent-person examination scheme must be understood; routine maintenance and thorough examination serve different purposes. [M2]



Lift suitability, maintenance and inspection information require routine attention. Observation: What would you verify before allowing this lift to remain in service?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Access, housekeeping and slips

Purpose: A workstation cannot be assessed in isolation from the journey to and from it. Here you learn to examine routes and changing floor conditions as part of the work, including busy periods, cleaning and access for different users.

Access means getting to a place; egress means leaving it. Review ordinary travel, maintenance access and emergency escape. Safety signs communicate a remaining risk or required behaviour. They cannot make a wet floor dry, hold up a structure or physically separate a pedestrian from a vehicle.

The coefficient of friction, or CoF, describes the relationship between frictional force and normal force under specified conditions. For a floor, its meaning depends on test method, contamination, footwear and movement. Do not use an unexplained CoF number as proof that all users will be safe. Assess how contamination reaches the floor, how quickly it is removed, whether the surface is suitable and how footwear performs in actual conditions. [S1]

Effective housekeeping is an organised system: appropriate storage, clear responsibilities, spill response, waste removal and checks during operating hours. Cleaning can temporarily increase slip risk. Segregate the affected area, provide an alternative route and verify that the surface is ready for use. A cone beside an unavoidable wet route warns but may not adequately protect.

Cleaning arrangements should control access to wet floors and preserve safe routes. Observation: How does this arrangement reduce the chance of a slip?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Workplace application and judgement

Purpose: We bring the environmental factors together because several conditions may affect the same task. The purpose is to turn separate observations into a reasoned account of what matters and what you still need to establish.

Northstar should first make the wet entrance safe, then investigate water tracking, matting, drainage and cleaning. At the labelling bench, assess glare and posture together. At the goods lift, compare maintenance records with examination findings and check that defects have been resolved. A single “environment satisfactory” tick would hide different mechanisms of harm and different evidence needs.

Use a maintenance cycle: define the standard; inspect under representative conditions; record deficiencies; assign action; verify the repair; and review after change. Include night work, cleaning, contractor work and abnormal operations. The justified conclusion

is that a suitable environment is demonstrated by performance under real conditions, not by a tidy appearance during a scheduled visit.

Try it before reading the discussion

Purpose: Use this pause to test whether you can question an apparently reassuring result. Explain your reasoning before comparing it with the discussion; choosing a conclusion without its reasons misses the learning purpose.

> Activity: a manager says, “The lighting reading meets our target, so the bench is safe.” Write two reasons that this conclusion is incomplete. Then propose one observation and one worker question. Discussion: a reading may miss glare, shadows, colour discrimination or the task plane. Observe a complete labelling cycle and ask when labels become difficult to read. Compare the evidence before deciding whether the control works.

Writing framework: identify the factor; explain its relationship to the task; describe the present arrangement; identify a limitation; state the maintenance or review action. Avoid claiming that an illustrative calculation proves legal compliance. Apply tomorrow: walk one route from entrance to workstation and then to welfare and escape facilities, recording where the conditions change.

AC 1.2 | Justifying welfare facilities

Official AC 1.2: Justify the full range of welfare facilities that must be available in a workplace.

Why this criterion matters: The assessment of working conditions also includes the facilities people need during the working day. Welfare means the arrangements for basic needs such as washing, drinking, changing, resting and using toilets. Provision only helps if it is suitable and genuinely available to the people doing the work. This connects the workplace assessment to the dignity, health and practical needs of its workforce. [W5]

What you are learning to do: You should be able to justify the facilities and arrangements required by the work and workforce, using evidence about shifts, access, contamination and actual availability.

Welfare is part of work design

Purpose: Begin with the people and the work, not a shopping list of facilities. This helps you explain why a provision is needed and how it must operate to be useful.

Justify means give defensible reasons for a choice. A list of toilets, water and a rest room is a beginning, not a justification. Explain who needs each facility, how the work creates that need, why the quantity and location are suitable, and how provision remains usable throughout the shift. Link your judgement to applicable requirements, worker consultation and operational evidence.

Welfare facilities support health, dignity and recovery. Facilities that exist on a drawing but are locked, contaminated or inaccessible are not effective provision. A toilet at the far end of a site may discourage use when workers cannot leave a process. A meal area beside chemical handling may expose workers to contamination. Evaluate the practical arrangement rather than counting rooms. [W1, W5]

Welfare facilities should be accessible, suitable and maintained in a clean condition. Observation: What else would you check to assess suitability for all workers?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Sanitary conveniences and washing

Purpose: These facilities meet basic needs during work. We study their suitability and accessibility so your assessment considers actual use, including different workers, tasks and shifts. [W5]

Sanitary conveniences are toilets and associated arrangements. Consider numbers, privacy, cleanliness, ventilation, lighting, accessibility and separation arrangements required for the workforce. Use the relevant regulatory guidance tables for actual worker numbers and workplace type. Do not substitute an invented universal ratio. Shift overlap, visitors, contractors and temporary workers can affect demand.

Washing facilities need suitable water, cleaning materials and a way to dry hands. Their adequacy depends on the work. Routine handwashing after ordinary work differs from washing after contact with hazardous contamination. Some work requires showers or specialised decontamination arrangements. An emergency eyewash or shower serves an

emergency purpose and does not replace normal welfare facilities. Selection and location should follow the substance and process risk assessment. [W5, C1]

Ask how facilities are maintained. Who replenishes soap? Who receives defect reports? What happens if water fails? Are cleaning arrangements suitable during both shifts? A cleaning record shows that someone recorded an activity; observation and user feedback are needed to determine whether the facility is actually usable. Repeated shortages may indicate inadequate staffing, procurement or supervision rather than careless users.

Rest areas support recovery and should be protected from workplace contamination. Observation: What features make this a suitable rest area?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Drinking water, clothing and rest

Purpose: The learning now follows the worker through the rest of the working day. Ask where people drink, change, store clothing and take breaks, and whether those arrangements suit the work being done. [W5]

Drinking water must be suitable and accessible. Identify drinking supplies clearly where confusion is possible. Consider heat, distance, mobility, shift patterns and contamination. A water point inside a controlled chemical area may encourage drinking where it should not occur. Separate clean welfare activities from hazardous processes and provide a practical route between them.

Clothing arrangements include secure storage for personal clothing and suitable accommodation for work clothing. Where contamination could spread, separate clean and dirty items and arrange appropriate laundering. Taking contaminated clothing home can transfer risk to families. Where changing is required, assess privacy, space, seating and access. Drying wet clothing may be necessary for the nature of the work. [W1, C2]

Rest and meal facilities should support recovery and hygienic eating. Consider clean surfaces, seating, the capacity at peak break periods and whether workers can actually use the space. Pregnant workers and nursing mothers may need suitable rest arrangements, with the relevant guidance addressing the ability to lie down where necessary. Consult sensitively and avoid unnecessary disclosure of medical information. [W1]

Safe drinking water and suitable washing facilities should be readily available. Observation: How would you confirm these facilities remain hygienic and accessible?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

First aid and well-being

Purpose: Prevention remains the starting point, but an organisation must also consider what happens if someone needs help. This topic introduces the reasoning behind provision and access rather than copying another site's arrangements.

First aid provision follows a needs assessment: the work hazards, workforce size, location, shift cover, absence, visitors and access to emergency services all matter. The outcome may include equipment, trained personnel, an appointed person and facilities appropriate to the circumstances. An appointed person is not automatically a trained first aider. A first-aid box cannot compensate for missing arrangements to summon and guide help. [F1]

Check that people know how to get assistance, including agency workers and those with limited language proficiency. Review lone and remote work, high-hazard activities and out-of-hours arrangements. Maintain supplies and protect medical confidentiality.

Training should fit the needs assessment and remain current. The arrangements should be tested in exercises, but exercises must not introduce unnecessary risk or expose private information.

Well-being also depends on workload, respectful treatment, recovery opportunities and access to support. Avoid presenting a wellness poster as a remedy for inadequate toilets or unsafe work. Distinguish mandatory welfare provision from additional support services. Both may be useful, but they answer different needs.

First aid arrangements include suitable supplies, trained people and clear access. Observation: What would you check beyond the contents of the kit?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

A welfare justification matrix

Purpose: The table helps you connect a need to a proposed facility and the evidence for it. Read each row as an argument: this work creates this need, so this provision is justified, subject to these checks.

Facility	Evidence needed	Reasoned question
Toilets and handwashing	Workforce and shift numbers; condition; access	Can every worker use suitable facilities when needed?
Drinking water	Water quality arrangements; location; replenishment	Is water accessible without entering a contaminated area?
Clothing and changing	Work clothing and contamination assessment	Are clean and contaminated items appropriately separated?
Rest and meals	Peak demand; cleanliness; worker feedback	Can people rest and eat without exposure or unreasonable delay?
First aid	Needs assessment; trained cover; emergency access	Is appropriate help available for every working period?

The matrix supports a justification; it is not a checklist of every legal detail. Add the applicable regulation, actual evidence reference, action owner and review date. “Adequate” should be the conclusion of analysis, not a word used instead of analysis.

Northstar: equal provision across shifts

Purpose: The fictional case tests the difference between a facility existing and workers being able to use it. Compare the experience of each shift before judging adequacy.

> Fictional teaching example: Northstar has 42 workers on the main shift and 18 on the late shift. A shared rest room seats 12, while breaks overlap. The only trained first aider is normally on the main shift. A worker using a mobility aid reports difficulty reaching the washroom. These figures do not establish a legal breach by themselves, but they identify matters requiring prompt assessment and action.

A defensible recommendation would address accessible facilities, first-aid cover during all operations and practical break capacity. Consult the affected worker privately. Review whether staggering breaks provides a workable interim arrangement without reducing rest entitlements or preventing access. Determine whether physical expansion is required. Give priority to essential provision and exposure prevention before decorative refurbishment.

Compare options fairly. A remote temporary facility may be quick to install but poor in bad weather. An accessible permanent refurbishment may better serve long-term needs but require interim provision. Record both the benefit and the dependency. Cost informs how a suitable solution is delivered; it does not justify withholding required facilities.

Practice and self-check

Purpose: This activity develops a justified welfare decision. The aim is to explain suitability using the workforce and task, not to reproduce a list from memory.

> Activity: write a recommendation for Northstar using “because”, “evidence” and “verification”. Model reasoning: provide suitable late-shift first-aid cover because the needs assessment must reflect actual working hours; confirm competence and absence cover through records and exercises; verify that late-shift workers can summon help. Do not prescribe a staffing number without completing the assessment.

Question: why might an apparently clean welfare room still be unsuitable? It may be inaccessible, too small at peak times, contaminated by nearby work or unavailable during a shift. Apply tomorrow: ask workers on a less-visible shift which facility is hardest to use and investigate the answer without treating a single account as the whole picture.

AC 1.3 | Understanding electrical hazards and risks

Official AC 1.3: Explain the hazards and risks posed by electrics in an organisation

Why this criterion matters: Electricity supports everyday work, yet its dangerous effects are not always apparent from appearance alone. We therefore move from visible workplace conditions to explaining a source of energy and the ways it can cause harm. Understanding the mechanism gives you a reason for selecting a control; simply calling something an electrical hazard does not explain who is exposed or how.

What you are learning to do: You should be able to explain a credible chain from an electrical condition or fault to exposure and harm, distinguish different mechanisms, and identify the information a competent assessment needs.

Explain the mechanism, not only the outcome

Purpose: We first separate the source of danger, the route of exposure and the resulting harm. That sequence makes the explanation useful when someone has to choose a control.

Explain means connect causes, conditions and consequences. Electricity can cause shock, burns, fire, explosion and secondary injuries such as a fall following a shock. Your account should identify where the energy is present, how someone or something can be exposed, and what changes the severity or likelihood. “Electricity is dangerous” does not demonstrate this understanding. [EL1, EL2]

Voltage is electrical potential difference, measured in volts. Current is the flow of electric charge, measured in amperes. Resistance is opposition to current in a simple resistive model; impedance extends the concept for alternating-current systems. Frequency describes cycles per second. These definitions help explain risk, but an introductory calculation must never be used to predict a safe current through a person.

The effect of shock depends on factors including current magnitude, duration, path through the body, frequency and contact conditions. Wet conditions, damaged skin and conductive surroundings can increase danger. A path across the chest can be particularly serious. Involuntary muscle contraction may prevent release. Contact can

also cause burns and loss of balance. There is no appropriate classroom experiment involving people and an electrical supply. [EL2]

Damaged equipment should be removed from use and assessed by a competent person. Observation: Which visible defects make this cable unsuitable for use?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Direct and indirect contact

Purpose: Different routes to electrical contact require careful explanation. Studying the distinction helps you describe the actual scenario rather than grouping every electrical concern under one label.

Direct contact concerns touching a part that is normally live. Indirect contact concerns touching an exposed conductive part made live by a fault, such as a metal enclosure following insulation failure. The terms help identify different failure paths, but neither should be assumed harmless because equipment looks intact.

At a maintenance bench, an open enclosure may expose normally live parts. In a warehouse, a damaged cable may energise a metal tool casing. At a temporary worksite,

a generator arrangement may introduce earthing and protection issues requiring competent design. The risk assessment must consider the actual supply and installation rather than assuming every portable generator behaves like a fixed mains outlet. [EL1, EL3]

Water and electrical equipment can create serious risk; access should be controlled. Observation: What needs to happen before this area can safely reopen?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Electrical fire and arc effects

Purpose: Electrical hazards extend beyond contact with a live part. This topic broadens the mechanism-based explanation so that your assessment does not overlook other harmful effects.

Overloading occurs when electrical demand exceeds what a component can safely carry under its actual conditions. Heating can also arise from poor connections, damage or deterioration. Insulation breakdown may permit faults and ignition. A protective device must be appropriately selected and coordinated with the system; the presence of a fuse does not prove that every foreseeable fault is controlled.

An electrical arc can release intense heat, light, pressure and molten material. Arc-related injury can occur without conventional contact shock. Equipment condition, available fault energy, task and protective arrangements matter. Do not invent a safe approach distance or specify arc-protective clothing from a generic photograph. Competent electrical assessment is required for the actual equipment and work. [EL1]

Ignition becomes especially important where flammable vapour, gas or combustible dust may be present. A small ignition source can initiate a larger event if the atmosphere and conditions are suitable. Static electricity is charge that accumulates and can discharge. Bonding connects conductive objects to reduce potential differences; earthing provides an appropriate connection to earth. Their design and verification depend on the process and materials. Ordinary earthing arrangements do not automatically resolve every static hazard. [D1]

Overloading and damage require equipment to be taken out of service. Observation: What signs suggest that this arrangement has been unsafe?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Portable equipment, generators and welding

Purpose: Equipment is used in different places and circumstances. These examples show why protection must match the supply, equipment and task rather than relying on the same assumption everywhere.

Portable equipment is frequently moved, handled, dropped or exposed to moisture. Flexible cables can be crushed, pulled or cut; plugs and sockets can deteriorate. An inspection should consider the conditions of use, user handling and changes since the previous check. A label showing an old test date is not assurance that a cable damaged this morning is safe.

Generators introduce both electrical and non-electrical hazards. Exhaust gases, including carbon monoxide, create a serious risk when fuel-powered generators are used in unsuitable enclosed or poorly ventilated locations. Fuel handling introduces fire risk. Electrical connections, protective arrangements and compatibility with connected equipment require competent planning. Do not improvise connections to a building supply. [EL3, C1]

Arc welding, including MIG and TIG processes, involves electrical supplies alongside optical radiation, hot work, fumes, gases and sometimes confined or conductive spaces. MIG uses a consumable electrode with shielding gas; TIG uses a non-consumable tungsten electrode with shielding gas. Those descriptions identify processes, not operating instructions. Assess the complete task: electrical shock protection alone will not control welding fume or fire spread. [EL1, R1, C2]

Construct a hazard pathway

Purpose: This exercise connects cause, exposure and consequence. Its purpose is to make a vague concern specific enough that you can identify where a protective measure must act.

Use a simple sequence: source of energy; initiating condition; exposure route; person or property affected; possible consequence; existing safeguards; uncertainty. For example, a flexible cable is crushed by a pallet truck, insulation fails, a worker handles damaged equipment, and shock or burns become possible. The damaged cable is evidence of deterioration; the absence of a reported shock is not evidence of adequate control.

Observation	Possible mechanism	What needs verification
Damaged cable sheath	Conductors may become exposed or protection compromised	Competent inspection and removal from service pending assessment
Water near equipment	Contact conditions and equipment suitability may change	Source of water, equipment rating and protective arrangements
Warm or discoloured connection	Overload, poor connection or deterioration may be present	Safe isolation and competent investigation
Temporary generator	Supply and earthing arrangements may differ	Designed connection, protection, exhaust and fuel controls

The table does not diagnose a fault from appearance alone. It identifies reasons to stop using affected equipment and obtain competent assessment. Untrained people should not open equipment to investigate.

Northstar and professional judgement

Purpose: Use the fictional evidence to decide what can reasonably be concluded and what remains unknown. The learning target is a justified response, not a confident technical diagnosis without supporting information.

> Northstar’s fictional maintenance log contains three cable defects in one month. A supervisor proposes retraining everyone to “take more care”. That may be one element, but first investigate routing, crushing, strain relief, equipment selection, storage and procurement. Repeated damage in the same area suggests a system problem. The strongest explanation connects the defect mechanism to the work arrangement.

Activity: distinguish hazard, exposure and consequence in “a worker uses a damaged grinder in a wet area”. The electrical energy and damaged insulation are hazard-related conditions; handling the tool in those conditions creates the exposure pathway; shock, burns or a secondary fall are possible consequences. More evidence is needed about the actual fault and safeguards, but uncertainty does not justify continued use of obviously damaged equipment.

Apply tomorrow: review how workers report electrical defects and what prevents defective equipment returning to use. A useful control includes a clear stop-use route and repair authorisation, not merely a warning label.

AC 1.4 | Evaluating electrical controls

Official AC 1.4: Review and evaluate control measures for electrics in relation to current legislation.

Why this criterion matters: Once you can explain the electrical hazard, the next question is whether the arrangements actually interrupt it. A control is a measure intended to prevent exposure or reduce harm; evaluation asks how well it does that under real conditions. This lesson connects the mechanism studied in AC 1.3 with maintenance, safe working arrangements, evidence and the applicable legal framework.

What you are learning to do: You should be able to review the existing controls, compare them with relevant requirements and evidence, explain their limitations and justify improvements within your area of competence.

From a list of controls to a judgement

Purpose: Evaluation moves beyond identifying which measures exist to examining whether they work for the particular hazard and task. That is the starting point for evaluating the organisation's arrangements.

Review means examine the arrangements and evidence systematically. Evaluate means judge their adequacy against relevant criteria, identify strengths and limitations and reach a supported conclusion. This criterion requires both, in relation to current legislation. Do not simply name the Electricity at Work Regulations 1989 and assume the task is complete. Explain how the relevant duties connect to the actual system and work. [EL2]

In Great Britain, the regulations address construction and maintenance of systems, suitability in adverse environments, insulation and protection, earthing or other suitable precautions, excess current protection, isolation, precautions for work made dead, live work restrictions, access and competence. Which provisions apply depends on the facts. Your review should identify the installation, equipment, people, task and operating conditions before judging arrangements.

Isolation requires an appropriate procedure and competent authorised people. Observation: What checks and communication should accompany the lock?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Use the hierarchy before relying on behaviour

Purpose: A reminder to be careful is not the whole design of protection. This topic helps you examine options that act on the hazard and exposure before placing reliance on what people must remember to do.

Start by avoiding the hazardous task or eliminating exposure where practicable. Select suitable equipment and a safer method. Arrange effective isolation and prevent unintended re-energisation for work that should be performed dead. Engineering protection, enclosure and appropriate system design provide stronger protection than telling people to be careful. Procedures, supervision and personal protection support the system but do not replace suitable equipment and isolation. [EL1]

A residual current device, or RCD, detects an imbalance in current and disconnects under specified conditions. It can provide additional protection, but it does not protect against every shock mechanism or make live work safe. A fuse or circuit breaker

principally provides selected overcurrent protection. Double insulation is a protective construction arrangement; it is not simply a plastic-looking case. Reduced voltage can reduce some risks, but supply configuration and other hazards still matter. [EL2, EL3]

Control selection is task-specific. Equipment suitable in a dry office may be unsuitable in a wet, corrosive or explosive environment. Look at ingress protection, mechanical strength, temperature, cable routing, connectors and manufacturer limitations. Route cables to avoid mechanical damage and tripping, with suitable protection where routes cross. Height alone is not a universal rule: overhead routing can introduce other hazards or conflict with equipment movement.

Routine checks can identify damage before equipment is used. Observation: Which parts of the tool and cable require inspection?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Safe systems for work made dead

Purpose: Maintenance can change the conditions that protect people during ordinary use. Understanding the logic of controlled electrical work helps you evaluate arrangements and recognise why competent planning and verification matter.

The management principle is that electrical work should be carried out dead wherever possible. A competent person must identify all relevant supplies, isolate, secure against re-energisation and verify the safe condition using appropriate methods and equipment. Stored energy and alternative supplies must be considered. A normal stop button, software command or open switch is not automatically secure isolation. [EL1]

This book teaches oversight, not a do-it-yourself isolation procedure. A manager should verify that the organisation has a suitable safe system, authorised competent people, appropriate equipment, clear boundaries, communications and handback arrangements. A permit-to-work is a formal control of particular high-risk work. It is not proof that isolation occurred, and a signature cannot substitute for the physical precautions.

Live working is subject to strict legal conditions. Convenience, production pressure or a routine preference does not by itself justify it. In Great Britain, the conditions in regulation 14 must all be satisfied, including that it is unreasonable in all the circumstances for the conductor to be dead, reasonable for the person to work on or near it while live, and suitable precautions are taken. Seek competent electrical advice rather than treating this wording as a general permission. [EL2]

Electrical work needs clear scope, competent people and coordinated controls. Observation: What information should be agreed before work begins?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Inspection, testing and maintenance

Purpose: Electrical conditions can deteriorate after equipment is purchased or checked. This topic explains why continued use needs a suitable maintenance arrangement and a reliable response to newly found defects.

User checks, formal visual inspection and electrical testing contribute different evidence. A user may notice damage before use. A formal inspection is more systematic. Testing can identify defects that visual examination cannot, but only when the right tests are performed and interpreted competently. Testing itself can introduce hazards and must be controlled.

There is no blanket legal requirement for every portable appliance to receive an annual PAT test. Maintenance arrangements and frequencies should reflect equipment type, use, environment, defect history and manufacturer information. PAT is the familiar abbreviation for portable appliance testing, not the name of the whole management

system. Record what was examined, by whom, with what result and what action followed. [EL4]

Evaluate both completion and effectiveness. A 100% inspection completion rate may coexist with repeated damage because the chosen interval is too long or the equipment is unsuitable. Sampling can help a management audit, but it does not excuse ignoring a known defect. Track repeat findings, overdue critical actions and the time between defect report and effective removal from use.

Evidence and evaluation table

Purpose: The table separates an arrangement from the evidence of its performance. Use it to explain what each record shows, what it does not establish and what further check would support a conclusion.

Control	Useful evidence	Limitation to challenge
Equipment selection	Specification, environment assessment, commissioning	A purchasing label may not reflect the actual use
Isolation	Authorised procedure, observations, permits, handback	A signed form may not match the physical state
Maintenance	Inspection results, defect trends, repairs	Completion alone does not prove defects were resolved
Competence	Task-specific assessment, experience, supervision	A course certificate may not cover this installation
Emergency arrangements	Isolation access, response plan, exercises	Workers may know a procedure but be unable to act safely

Write an evaluation in the form: criterion; evidence; strength; gap; significance; action; verification. State the extent of your review. “The sampled records support…” is more accurate than “all electrical equipment is safe” when only a small sample was examined.

Northstar: choosing a better intervention

Purpose: Several responses may sound reasonable. The case asks you to compare them with the mechanism of harm and the available evidence so that your recommendation addresses the problem identified.

> Fictional teaching example: Northstar completes all scheduled annual tests, but cables crossing a dispatch route are damaged repeatedly. The test programme is a strength in planned maintenance, but it is not preventing the known damage mechanism. Isolate and remove defective items, obtain competent advice on rerouting or an appropriate alternative supply arrangement, and review inspection frequency in light of use. Train workers on reporting and stop-use arrangements as part of the wider change.

A recommendation to “test every month” may increase detection but leave the source of damage intact. A stronger evaluation compares prevention, detection and response. It also considers whether the proposed rerouting introduces trip, access or vehicle-clearance problems. Verify the intervention through observations during busy dispatch periods and a review of subsequent defects.

Activity: a contractor says an RCD allows them to work live without isolation. Explain why that is inadequate. Discussion: an RCD provides only particular protection; live work requires the statutory conditions and suitable precautions, assessed by competent people. The appropriate management response is to stop the unsupported arrangement and require a justified safe system.

Apply tomorrow: select one recurring electrical defect and trace it from report to removal, repair, authorisation and return to service. Identify where accountability could be lost.

AC 1.5 | Assessing structural integrity

Official AC 1.5: Assess the hazards and risks associated with the structural integrity of buildings.

Why this criterion matters: The building and its supporting structures are part of the safety system, even when they are so familiar that nobody questions them. This lesson asks you to consider what supports people, stock and equipment, and what could change that position. Assessment begins by distinguishing an observed warning sign from a technical diagnosis; uncertainty is a reason to obtain the right evidence, not to assume that continued use is acceptable.

What you are learning to do: You should be able to identify plausible structural hazards, explain people and assets at risk, record evidence and recognise when restrictions and competent structural assessment are needed.

What structural integrity means

Purpose: Start with what the structure is required to do. Understanding its function provides the basis for asking whether its condition and loading remain suitable.

Structural integrity is the ability of a structure to support the loads and conditions for which it must perform without unacceptable failure. A building carries its own weight, people, stored materials, equipment and environmental loads through a connected load path to the ground. A load path is the route by which forces are transferred through slabs, beams, columns, walls, connections and foundations. Changing one element can affect others. [B1, B2]

Assess means examine hazards, people exposed, existing safeguards, the quality of evidence and the significance of remaining risk. A health and safety practitioner can identify warning signs, control access and commission specialist assessment. They should not certify structural capacity from a photograph, invent permissible crack widths or design temporary support without appropriate engineering competence.

Structural concerns should be isolated and assessed by a competent specialist. Observation: What observations would help determine the next action?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

How deterioration and change create risk

Purpose: The past use of a building does not describe every future demand on it. This topic helps you notice changes in condition, loads or use that should trigger a further assessment.

Adverse weather may damage roof coverings, cladding, drainage, fixings and exposed structures. Wind, snow, water accumulation and temperature effects must be considered in the actual design context. A blocked drain can add load and accelerate deterioration. Corrosion can reduce the effective section of metal components; heat or fire can alter material performance and damage connections. Appearance alone may underestimate hidden deterioration. [B2]

Overloading occurs when imposed demands exceed the suitable capacity of the structure or component. A floor’s overall load limit may not describe a concentrated machine load or rack-leg reaction. Dynamic loads from moving equipment can differ

from static loads. Vibration can affect fatigue, connections or adjacent structures. Assess proposed use against verified design information rather than assuming that a floor supporting one arrangement will support every replacement.

Alterations to structural members can interrupt the load path. Removing a wall, cutting an opening, drilling through a member or adding a mezzanine may have consequences beyond the immediate work area. Subsidence is downward movement of the ground supporting a structure; differential movement can distort it. Poor design, substandard workmanship and missing information can create vulnerabilities even where no deterioration is visible.

Impact-damaged racking requires access restrictions and competent assessment. Observation: What immediate controls are visible, and what should happen next?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Warning signs and immediate response

Purpose: You may see a concern before its cause is known. Here the purpose is to recognise the need for a protective response and competent advice without presenting an observation as a confirmed diagnosis.

Possible warning signs include new or changing cracks, unusual deflection, leaning, corrosion, spalling concrete, damaged connections, water ingress, unexpected movement, impact damage and unusual sounds. They are prompts for investigation, not a remote diagnosis. Consider the location, change over time, loading history and whether people are exposed to falling material or collapse.

Where credible evidence suggests instability or falling-object danger, protect people first. Restrict access to a proportionate area, prevent additional loading or disturbing work and arrange competent engineering assessment. Do not send someone underneath a suspect area to obtain a better photograph. Barriers should reflect the potential collapse or fall zone, with specialist advice where required. [B1]

An emergency response may include evacuation and contacting emergency services. It should be triggered by the actual conditions and organisational arrangements, not delayed until a risk score can be calculated. A low score cannot neutralise credible potential for catastrophic failure with insufficient evidence of stability.

Building an evidence-based assessment

Purpose: The next step is to organise observations, records and specialist input into a defensible judgement. We study evidence quality because an incomplete record can support only a limited conclusion.

Gather drawings, structural calculations where available, maintenance records, inspection reports, alterations, impact incidents, loading schedules and relevant ground information. Check whether records describe the current building. An old drawing may omit later penetrations or additions. Speak to maintenance staff and users, who may notice changes that do not appear in formal records.

Record observations with dates, locations and an appropriate scale, from a safe position. Distinguish observation from interpretation: “a visible crack above the doorway” is an observation; “foundation failure” is a diagnosis that needs evidence. Track change only under a competent monitoring plan. Monitoring is not an acceptable substitute for immediate protection where the structure may be unsafe.

Identify people exposed during normal use, deliveries, cleaning, roof maintenance, contractor work and emergencies. Include neighbouring premises and the public where relevant. Consider failure consequences, the reliability of current controls and uncertainty. Set a clear referral threshold: what finding triggers engineering review, restriction, evacuation or a hold on planned changes?

Northstar: the damaged rack and proposed mezzanine

Purpose: This fictional comparison brings together an existing defect and a planned change. It helps you distinguish immediate response from the evidence and approval needed before a new arrangement is introduced.

> Fictional teaching example: a vehicle strikes a rack upright. The driver reports it, and a manager suggests painting over the mark because the rack is still standing. The correct first judgement is that continued standing does not demonstrate retained capacity. Restrict the affected area and obtain competent racking assessment under the site's arrangements. Do not improvise unloading where that activity could destabilise the rack.

The proposed mezzanine creates a separate assessment. Ask what load it introduces, how that load reaches foundations, whether existing services or fire arrangements are affected, and whether construction changes the stability of the building. Capacity and regulatory approvals require the appropriate designers and authorities. Health and safety management coordinates information, interfaces and precautions; it does not replace engineering design.

Evidence	What it helps establish	What it cannot establish alone
Current structural drawings	Intended arrangement and load paths	Present condition or unrecorded alterations
Dated damage observations	Location and change	Remaining load-bearing capacity
Engineering assessment	Condition, significance and specified action	Continued compliance after later unauthorised change

Evidence	What it helps establish	What it cannot establish alone
Maintenance records	Known defects and action history	Absence of defects that were never reported

Practice and conclusion

Purpose: Use this exercise to explain both your conclusion and its limits. A sound structural assessment identifies the next competent decision needed, rather than guessing at a structure's capacity.

> Activity: write a three-part response to a new ceiling deflection after heavy rain. Discussion: protect people from the suspect area; report and obtain competent assessment, including water accumulation and loading; retain a clear record of restrictions and conditions for safe reoccupation. Do not instruct staff to climb onto a roof to clear water without an assessed safe system.

A justified conclusion states both what is known and what remains uncertain. “The available evidence is insufficient to confirm safe continued use of the affected bay; access remains restricted pending competent assessment” can be more professionally sound than an unsupported declaration of safety. Apply tomorrow: check who must approve structural alterations and whether operations know that apparently small changes can require review.

AC 1.6 | Evaluating structural controls and legal arrangements

Official AC 1.6: Review and evaluate control measures for structural integrity in relation to current legislation.

Why this criterion matters: The assessment of structural hazards must be followed by examination of how an organisation prevents deterioration, manages alterations and verifies that defects are properly addressed. The purpose is to move from reacting to a crack or impact towards evaluating the arrangements that keep a building suitable throughout its use. It connects the assessment in AC 1.5 with ownership, inspection, maintenance, change control and relevant requirements.

What you are learning to do: You should be able to judge whether those arrangements are suitable, implemented and effective, identify evidence gaps and explain how a proposed improvement will be checked before normal use is authorised.

Evaluate the management system around the structure

Purpose: Individual inspections only help when the organisation acts on their findings. This topic asks who makes decisions, closes defects and checks whether a structure remains suitable for its use.

This criterion moves from recognising structural risk to judging whether controls are adequate in relation to applicable law. In Great Britain, workplace maintenance and stability duties may arise under the Workplace Regulations and general health and safety duties. Construction, alteration and demolition can bring the Construction (Design and Management) Regulations 2015 into scope. Building regulations and specialist building-safety regimes have their own application. Do not treat every workplace as if the same detailed building regime applies. [W1, B1, B3]

Begin by defining the premises, occupancy, ownership and control. In leased premises, identify the landlord’s and occupier’s responsibilities, while recognising that a lease does not simply remove statutory duties. Shared buildings need coordination. A repair request sent to a landlord is evidence of communication, not proof that the hazard is controlled in the meantime.

Roof concerns require safe assessment and controlled access. Observation: Why is ground-level observation an appropriate starting point?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Prevention through design and controlled change

Purpose: A change can create a problem before deterioration is visible. Prevention begins at the planning stage so that suitability, interfaces and responsibilities are examined before work proceeds.

Prevention starts with suitable design, competent construction and verified suitability for the intended use. After occupation, proposed changes must be assessed before implementation. A management-of-change process records the proposal, affected structure, design review, necessary approvals, temporary precautions, construction method, inspection and handover. “It is only a small opening” is not an adequate engineering justification.

The process should also cover operational changes: denser storage, heavier equipment, new vibration sources, corrosive processes and altered drainage. A procurement team may introduce a structural issue before a safety team hears about it. Include facilities,

operations, engineering and purchasing in the change route, with responsibility for maintaining accurate drawings and load information.

Where temporary works support construction or an existing structure, they must be properly designed, checked and managed for the actual conditions. Temporary does not mean informal. Scaffolding is not automatically structural support; it must be specifically designed for that purpose if it is to support a structure. Changes to a sequence of work can change stability and must be reviewed. [B1]

Building changes need structural assessment and coordination before work starts. Observation: Which operational and structural issues should the team consider?

AI-generated fictional teaching scene. It does not prove workplace performance or compliance.

Inspection, maintenance and escalation

Purpose: Identifying a defect is the start of a response, not its completion. Here you learn to examine how findings lead to action and how unresolved concerns reach someone able to decide.

An inspection programme should reflect condition, exposure, use, consequences of failure and specialist recommendations. Routine observations by users, planned maintenance inspections and specialist structural assessments are different layers. Do not invent a universal annual interval for every building. Define scope, competence, findings, escalation criteria and follow-up.

Trigger additional review after impacts, severe weather, fire, flooding, unexpected movement, significant corrosion or unauthorised alterations. A calendar-based inspection does not justify waiting when a new event has changed the conditions. Maintain drainage, roof coverings, fixings and protective coatings where they contribute to integrity. Ensure maintenance tasks themselves have safe access and work arrangements.

Action closure must be evidence-based. A work order marked complete may mean a contractor attended, not that the specified repair was verified. Require appropriate inspection, documentation and authorisation before restrictions are removed. Retain limitations: a temporary repair may require monitoring, load restrictions or a permanent follow-up solution.

Governance and assurance

Purpose: Governance means the arrangements for directing decisions and accountability; assurance means obtaining evidence that those arrangements work. These ideas help you evaluate whether structural responsibilities remain clear over time.

Governance is the arrangement for decisions, authority and accountability. Name who can stop use, commission an engineer, approve expenditure, authorise alterations and permit reoccupation. Give operations a clear escalation route when responsible people are unavailable. Contractor competence should match the work, with suitable design and inspection capability rather than an unrelated general certificate.

Assurance means obtaining reliable evidence that the system works. Review whether the register includes all buildings and structures, whether overdue high-priority actions are visible, and whether changes are captured. Sample a completed repair from the original finding through specification, execution and verification. Speak to users about reporting barriers and check whether warnings are removed only after authorised release.

A control evaluation in practice

Purpose: We bring the system and its evidence together in one example. The purpose is to practise distinguishing completed activity from a verified result.

> Fictional Northstar evidence: quarterly facilities checks exist, but the mezzanine proposal bypassed engineering review and two rack-impact reports lack closure evidence. The scheduled checks are a strength, yet the change and defect-management arrangements are weak. Prioritise restriction and competent assessment of affected racks, a hold on the mezzanine change, and a documented approval route for future structural or loading changes.

Do not conclude that the entire organisation is non-compliant from two observations without establishing the relevant facts and duties. Equally, do not allow uncertainty about legal classification to delay protection from a credible hazard. Separate the immediate safety decision from the subsequent legal and technical evaluation.

Evaluation element	Strong evidence	Weak substitute
Change approval	Current design review and authorised conditions	Verbal reassurance that similar work happened before
Defect control	Restricted area, competent assessment and tracked action	A warning sign without control of access
Repair closure	Verification against the specified repair	An invoice or attendance note alone
Continued suitability	Load/use review and inspection after change	Original approval with no review of later alterations

Section 1 synthesis

Purpose: Step back from the six criteria and examine the workplace as one connected system. This closing exercise checks whether you can link conditions, welfare, energy and structure in a coherent professional judgement.

Workplace conditions, welfare, electrical safety and structural integrity share one principle: actual use must match the assumptions behind protection. If the work

changes, review the assumptions. If evidence is weak, state the uncertainty and obtain the right expertise. If there is immediate danger, protect people before completing the paperwork.

Final activity: present a five-minute management briefing for Northstar. State the immediate actions, three evidence gaps, the responsible specialists and how effectiveness will be checked. Use plain language and distinguish observations from conclusions. A strong response explains why a cable rerouting project and a structural restriction cannot be replaced by a general safety talk.

Apply tomorrow: choose one completed corrective action and verify its result with the people who use the workplace. Ask not only “Was it done?” but “Did it solve the problem without creating another one?”

02

MAINTAINING A SAFE WORKING ENVIRONMENT

Understand. Examine. Apply. Reflect.

Section 2 | Different contexts, different controls

LEARNING OUTCOME 2

Understand the hazards, risks and controls applicable to a range of workplace contexts.

Why this section matters: A safe workplace depends on how work is actually carried out as well as the condition of its buildings. This section helps you understand why a control that works for one activity may fail in another. You will explore changing tasks, people working without immediate help, physical demands and exposures that may cause harm without an obvious incident.

What this section prepares you to do: By the end, you should be able to compare controls across distinct work contexts, explain the effects of noise, vibration and radiation, and identify the evidence needed to judge exposure. You will practise asking whether a control prevents harm in the actual conditions and how its effectiveness can be checked.

Next reading: Building on the idea of a suitable working environment, begin with the task itself: what changes when people move, enter, lift or work alone?

AC 2.1 | Evaluating controls across six work contexts

Official AC 2.1: Evaluate the control measures in place within your organisation to control the following risks: temporary works; workplace transport; working in confined spaces; working at height; lone working; manual handling.

Why this criterion matters: Workplace risks change when the task, location or available help changes. This criterion develops your ability to look beyond a generic assessment and ask whether the controls fit each of the six specified work contexts.

What you are learning to do: You will practise evaluating actual arrangements, explaining their strengths and limitations, and proposing an improvement with a way to verify it. Look for interactions between activities as well as the risks within each one.

Make the evaluation specific

This criterion covers temporary works, workplace transport, confined spaces, work at height, lone working and manual handling. Each needs a distinct account. A generic risk matrix repeated six times will not explain why a particular control is effective. Define the task, people, conditions and failure mechanisms before comparing the actual arrangements with suitable criteria.

Use the same evaluation structure for each context: identify the significant risk; establish the relevant standard; examine the control as it operates; identify strengths and limitations; recommend proportionate improvement; and define how the result will be verified. Where your organisation does not undertake a listed activity, follow the centre brief on an acceptable alternative or case context. Do not invent workplace evidence.

Temporary works: manage the changing state

Temporary works are engineered arrangements needed to enable construction or related work, such as support, formwork, falsework, excavation support or temporary access. Their risks can change rapidly as work proceeds. A design that is adequate at the final stage may not be adequate during erection, loading, alteration or dismantling. The sequence is therefore part of the safety-critical information. [TW1]

The management review should establish what requires design, who prepares and checks it, who coordinates interfaces, and what authorisation is needed before loading or removing support. The design brief must describe actual ground, loads, surroundings and work methods. A temporary works coordinator provides coordination within a defined system; appointing a person does not remove the need for adequate design, resources and checks.

Evaluate whether site changes reach the designer and whether people recognise hold points. A hold point is a stage beyond which work must not proceed until a specified check or authorisation is complete. A verbal instruction to remove a prop can bypass the entire design logic. Look for recorded release, inspection and change control rather than relying on the experience of the person issuing the instruction.

Fictional Northstar example: a contractor proposes supporting a wall opening during a refurbishment. Operations want the opening enlarged after the design is issued. The change must return to the appropriate designer and checking process before work proceeds. The fact that the original support is already on site does not make it suitable for the revised opening.

Workplace transport: safe site, safe vehicle, safe driver

Workplace transport includes delivery vehicles, forklifts, loading activities and movements within shared premises. People can be struck, crushed, trapped or fall from vehicles. Loads can move or fall. Reversing, poor visibility, mixed traffic and uncontrolled visitor movement can increase risk. HSE’s safe site, safe vehicle and safe driver structure is a useful way to avoid focusing only on driver behaviour. [T1]

Review the layout first. Can movements be eliminated or separated? Are pedestrian routes physically protected where necessary? Are crossings located where drivers and pedestrians can see each other? Consider lighting, gradients, surface condition, loading bays, blind corners and shared responsibilities. A painted line gives information; a suitable barrier can provide physical separation. Their functions differ.

Vehicles must suit the task, load and environment, with maintenance, checks and appropriate safety features. Drivers need competence for the specific equipment and workplace. Visiting drivers need understandable instructions before exposure, including where to wait and how unloading is controlled. A reversing assistant can introduce another exposed person and requires a properly designed safe system; it is not an automatic solution to a poor layout.

At Northstar, a fictional pedestrian shortcut crosses a loading route because the designated path adds a long detour. Evaluate why the shortcut is attractive and whether a safer practical route can be provided. Disciplining pedestrians alone may leave the work-design problem intact. Measure vehicle-pedestrian interactions and observe peak delivery periods after redesign.

Confined spaces: entry is not the first option

A confined space is not simply a small room. In the Great Britain regulatory context, it is substantially enclosed and presents a reasonably foreseeable specified risk, such as serious injury from fire or explosion, loss of consciousness or asphyxiation, drowning, or asphyxiation from free-flowing solids. Tanks, pits, ducts and other locations may qualify depending on their conditions. [CS1]

Avoid entry where reasonably practicable, for example by cleaning or inspecting from outside with a suitable method. If entry is necessary, a competent assessment must consider atmosphere, access, isolation, the task, materials, equipment, changing conditions and rescue. An atmosphere acceptable before entry can change during the work. Testing must be appropriate to the hazards, method and locations; one reading is not a permanent guarantee.

Evaluate safeguards for reliability, including isolation from incoming materials and energy, communications, supervision, ventilation, suitable equipment and competent personnel. PPE cannot turn an uncontrolled space into a safe one. Oxygen-deficient atmospheres require specialist respiratory protection and arrangements; filtering respirators do not supply oxygen.

Emergency arrangements must be planned and practicable before entry. Do not rely solely on emergency services arriving in time. Unplanned entry by would-be rescuers can create multiple casualties. The management question is whether the rescue method, personnel and equipment have been assessed and can be used without exposing rescuers to uncontrolled danger. This book does not provide an entry or rescue procedure.

Working at height: prevent the fall

Work at height includes places where a fall could cause injury, including openings and work near edges. There is no general two-metre threshold below which falls cease to matter. Apply the hierarchy: avoid work at height where possible; prevent falls where it cannot be avoided; and minimise the distance and consequences of a fall where prevention is not sufficient. Give collective protection priority over individual protection. [H1]

Choose equipment for the task, duration, location and conditions. A mobile elevating work platform, or MEWP, may be appropriate for some tasks but brings requirements for ground conditions, selection, operation, entrapment risks and rescue. Scaffolds, platforms and ladders serve different purposes. A ladder is not automatically prohibited, but suitability must be justified for the actual work.

Fall restraint prevents a person reaching a fall position; fall arrest stops a fall after it has begun. Arrest systems require suitable anchorage, compatibility, clearance, inspection, training and rescue planning. A harness hanging on a hook is not evidence that these requirements are met. Assess falling objects and the people below as well as the person at height.

Fictional Northstar example: a worker climbs shelving to retrieve a carton. The immediate intervention is to stop the unsafe access. The longer-term evaluation asks why stock is stored there, whether retrieval can be performed from ground level, and what suitable equipment and workflow are needed. The control should solve routine access rather than depend on repeated warnings.

Lone working: plan for loss of assistance

Lone working means working without close or direct supervision. The task may be acceptable for a team but unsuitable for one person because there is no immediate help if something fails. Consider the work, location, public contact, violence, travel, communication coverage, medical factors and emergency response. Some activities require more than one person for safe operation or rescue. [LW1]

A check-in system only helps if someone reliably monitors it and acts when a check is missed. Define the escalation time, contact sequence, location information and response capability. A phone with no signal is not an effective communication control. Personal alarms, training and supervision should match the risks rather than creating a false impression of continuous protection.

Assess medical information sensitively through appropriate occupational-health arrangements where required. Managers generally need fitness-related restrictions and arrangements, not unrestricted access to diagnoses. Workers should understand when they may decline or stop a lone task and how to obtain assistance.

Manual handling and repetitive work

Manual handling includes lifting, lowering, carrying, pushing, pulling and moving a load by bodily force. Musculoskeletal risk depends on the task, individual capability, load, environment and other factors such as frequency and duration. There is no universal safe lifting weight for every person and situation. Avoid hazardous manual handling where reasonably practicable, assess what remains and reduce risk. [MH1]

A load’s mass is only one feature. Grip, size, stability, reach distance, twisting, uneven floors and unpredictable movement matter. Pushing a trolley may reduce carrying but create high starting forces or collision risks. Mechanical aids require suitable routes, maintenance, training and storage. Good technique supports control, but training cannot compensate for a poorly designed task indefinitely.

Select assessment tools for the task. HSE MAC supports assessment of common lifting, carrying and team-handling risks. V-MAC supports certain variable-load situations. ART addresses repetitive upper-limb tasks. RULA screens upper-limb postural risk. A DSE checklist addresses display-screen work. These methods are not interchangeable, and a screening score is not a diagnosis or a complete assessment. Use the tool instructions, observe representative work and involve the workers. [MH2]

Job rotation reduces exposure only if the new task changes the relevant demand. A lighter load lifted far more frequently can still create substantial risk. Review purchasing, package sizes, delivery height, storage design, pace and recovery. Verify improvement through observation and suitable outcome information, without waiting for injury reports to rise.

Integrated activity

> Prepare six short evaluations for Northstar, one per context. For each, include one control that prevents exposure and one method of verifying it. Then identify interfaces: a MEWP may affect transport routes; temporary works may reduce emergency access; lone maintenance may involve electrical isolation. Strong practice examines these interactions rather than approving each activity in isolation.

AC 2.2 | Noise and vibration: types, effects and controls

> Official AC 2.2: Outline the types of noise and vibration, the effects of being exposed to these, and their control measures.

> **Why this criterion matters:** After examining distinct work activities, consider harmful physical exposures that can accompany many of them. Noise and vibration need different explanations and controls; grouping them together as discomfort can hide the mechanisms that cause harm.

What you are learning to do: You will learn to distinguish their main types, link exposure to possible health effects, and explain how controls at the source, along the transmission path or at the person contribute to protection.

Noise is unwanted or harmful sound in the context of work. Continuous, intermittent and impulsive noise require attention to both average exposure and peaks. Long-term exposure can damage hearing; high-energy events can also cause harm. Noise can interfere with speech, warning signals and concentration. Hearing damage may be irreversible and may develop before a person recognises difficulty. [N1]

Hand-arm vibration, or HAV, enters through the hands while using vibrating tools or processes. Whole-body vibration, or WBV, is transmitted through a supporting surface such as a vehicle seat or platform. HAV can affect circulation, nerves and muscles; WBV is associated with back-related risks, especially with shocks, poor posture and other factors. Do not treat them as the same exposure with the same numerical criteria. [V1, V2]

Control noise at source wherever practicable. Consider quieter processes or equipment, maintenance, impact reduction, damping and enclosure. Damping reduces vibration energy in a structure; isolation reduces transmission between connected elements. Along the transmission path, barriers, absorption and layout changes may help, depending on frequency, geometry and reflected sound. Protecting the receiver through reduced exposure or hearing protection is important when needed but should not become the only strategy.

For vibration, consider alternative methods, lower-vibration equipment, suitable consumables, maintenance, reduced force, improved surfaces and seats for vehicles, and realistic exposure duration. Anti-vibration gloves are not a reliable substitute for controlling hand-arm vibration. Job rotation can reduce individual exposure but may distribute the same hazard to more people without reducing the source.

Fictional Northstar example: a worn bearing increases machine noise. Issuing stronger ear defenders may lower sound reaching the wearer, but maintenance can address the source and improve communication. A driver reports shocks from a damaged yard surface. Seat adjustment alone cannot compensate for an unsuitable route, speed or surface condition.

Activity: explain the difference between sound absorption and sound insulation. Absorption reduces reflected sound within a space; insulation concerns reducing sound transmitted through a construction or barrier. Choosing material only because it looks soft can fail if the mechanism and frequencies are misunderstood.

AC 2.3 | Measuring and assessing noise and vibration

> Official AC 2.3: Explain the measurement, assessment and methods to control exposure to noise and vibration.

> **Why this criterion matters:** Recognising noise or vibration does not tell you how much exposure a person receives. This criterion addresses the gap between noticing a concern and making a decision supported by representative measurements, task information and realistic exposure durations.

What you are learning to do: You will practise explaining assessment methods, interpreting the purpose and limitations of exposure information, and relating findings to control choices. You should be able to identify when uncertainty or specialist input needs attention before drawing a firm conclusion.

Exposure is a combination of level and time

Noise exposure assessment requires representative information about tasks, sound levels and duration. A sound-level meter measures sound at a position; a personal dosimeter can help assess an individual's exposure over time. Instrument selection, calibration, placement, task observations and unusual events affect interpretation. A phone application may help identify a concern, but it should not be assumed suitable for a formal compliance assessment. [N1, N2]

Decibels use a logarithmic scale. Do not calculate an exposure average by simply adding two dB values and dividing by two. A 3 dB increase represents approximately twice the sound energy for an equivalent measurement context. Daily exposure normalises the accumulated exposure to a reference duration; it does not mean that every minute of the shift had the reported level.

In Great Britain, lower daily or weekly exposure action values are 80 dB(A), with a peak value of 135 dB(C); upper action values are 85 dB(A) and 137 dB(C). Exposure limit values are 87 dB(A) and 140 dB(C), taking account of hearing protection for the limit assessment. Action values are considered without that reduction. The required actions

and use of weekly averaging depend on the regulations. These values are not a promise of no risk below a threshold. [N1]

Worked noise example

> Fictional teaching data: a task exposes a worker to 88 dB(A) for two hours, with remaining noise sufficiently low to ignore only for this simplified illustration. Normalising that contribution to eight hours gives 88 + 10 log10(2/8), approximately 82 dB(A). Real assessments must add every relevant exposure contribution and consider peaks and uncertainty. Do not conclude compliance from an incomplete shift account.

Octave-band analysis separates sound into frequency bands. It can support engineering design and hearing-protector selection. SNR is a single-number rating; HML uses high-, medium- and low-frequency information. Ratings are not a guarantee of real-world protection. Fit, compatibility, condition and correct use matter. Excessive attenuation can make communication or warning detection difficult, so selection should provide appropriate protection rather than simply the highest number. [N2]

Vibration assessment

Daily vibration exposure, A(8), combines vibration magnitude and exposure duration over an eight-hour reference period. For a single constant exposure, $A(8) = a \times \sqrt{(T/8)}$, where a is the relevant acceleration magnitude in m/s^2 and T is hours of actual exposure. Multiple tasks require the appropriate combination method, not a simple average. Actual trigger time for a tool may differ greatly from the time it is issued to a worker. [V1]

Fictional teaching data: 5 m/s^2 for two hours gives an A(8) of 2.5 m/s^2. In Great Britain, the HAV action value is 2.5 m/s^2 A(8) and the limit value is 5 m/s^2 A(8). For WBV, the corresponding values are 0.5 and 1.15 m/s^2 A(8), with additional assessment considerations including shocks. Use the appropriate HSE guidance and competent assessment for the actual exposure. [V1, V2]

Manufacturer information can inform an initial estimate but may not represent site use, material, consumables or maintenance. Record assumptions and obtain more representative data when the decision depends on them. HSE calculators support calculations; they do not select a safe method or certify the accuracy of input data.

Health surveillance and judgement

Health surveillance checks for early signs of work-related ill health where appropriate. Audiometry assesses hearing thresholds; audiograms must be interpreted by competent occupational-health professionals in context. Surveillance does not reduce exposure by itself and is not a substitute for control. Maintain confidentiality and use appropriate anonymised trends to review the prevention programme. [N1, V1]

Activity: an exposure estimate lies just below an action value, but task duration is uncertain by an hour. State why a firm “no action needed” conclusion is weak. A stronger response addresses uncertainty, obtains representative information and implements proportionate improvements while clarifying the exposure. Explain both the calculation and the decision it supports.

AC 2.4 | Effects of radiation exposure

> Official AC 2.4: Describe effects of being exposed to the different types of radiation.

> **Why this criterion matters:** Radiation extends the discussion of physical exposure to hazards that people may not be able to detect through their senses. Understanding the type of radiation matters because its effects and exposure pathways influence the protection required.

What you are learning to do: You will learn to distinguish key radiation categories and describe their potential health effects. You should also be able to explain important terms accurately, recognise the limits of a general account and frame useful questions for radiation specialists.

Radiation transfers energy as waves or particles. Ionising radiation has sufficient energy to ionise matter; examples include X-rays, gamma radiation and emissions from radioactive materials. Non-ionising radiation includes ultraviolet, visible and infrared radiation, lasers, radiofrequency and other electromagnetic fields. The term non-ionising does not mean harmless. [R1, R2]

Ionising exposure can occur from an external source or through radioactive material entering the body. Irradiation means exposure to radiation; contamination means radioactive material is present where it should not be. A person can be irradiated without becoming contaminated. The control and emergency implications differ, so use the terms accurately.

Health effects depend on radiation type, dose, dose rate, exposed tissue and other factors. Tissue reactions can occur above relevant dose thresholds, while stochastic effects such as cancer are treated in radiation protection as having a probability related to dose. Do not use a simplified textbook explanation to predict an individual’s medical outcome. Specialist advice is essential for radiation work. [R2]

Ultraviolet exposure can damage skin and eyes; welding and outdoor work are common examples. Infrared and intense visible radiation can create thermal or eye hazards. Laser risk depends on wavelength, power, exposure and the optical arrangement; a reflected beam can matter. Radiofrequency exposure and electromagnetic fields require assessment appropriate to frequency, intensity and exposed people, including those with relevant medical devices.

Fictional Northstar example: contractors use an industrial radiography source during inspection. The absence of visible light or smell does not indicate that the area is safe. Access control, authorised arrangements and specialist radiation protection are critical. In the workshop, welding screens protect other people from optical radiation, but do not resolve the welder's fume exposure.

Activity: explain why "all radiation is controlled by lead shielding" is wrong. Different radiation types interact differently with materials and people. Shielding design, containment, time, distance, interlocks and administrative arrangements are selected for the specific source and work, not for the word radiation alone.

AC 2.5 | Measuring, assessing and controlling radiation

> Official AC 2.5: Explain the measurement, assessment and methods to control exposure to different types of radiation.

> **Why this criterion matters:** Once you understand why radiation can cause harm, the next question is how an organisation establishes and maintains protection. A warning sign or isolated reading cannot explain whether the right sources, people and operating conditions have been assessed.

What you are learning to do: You will learn to explain why measurement and control methods must match the radiation involved. You will practise identifying evidence, coordination and specialist advice needed to review arrangements, including changes, contractor work and abnormal conditions.

Start with an inventory of sources and activities. Include equipment that generates radiation, radioactive materials, naturally occurring sources relevant to the workplace and contractor activities. Identify who may be exposed and under what conditions: normal operation, setup, maintenance, failure and emergency response. Confirm the applicable regulatory arrangements before work begins. [R1]

In Great Britain, work with ionising radiation may require notification, registration or consent depending on the practice. The Ionising Radiations Regulations 2017 and HSE guidance establish the framework. Appropriate radiation protection advice, risk assessment, local rules and supervision may be required. Do not infer the correct regulatory category from an equipment label alone. [R2]

Measurement must match the radiation type and purpose. A dose-rate instrument is not interchangeable with a contamination monitor. Personal dosimetry measures or estimates individual exposure in a defined way; it does not necessarily reveal the location of a source. Instrument range, energy response, calibration, geometry and background affect interpretation. A reading without units and method is not meaningful evidence.

For ionising radiation, reduce exposure through suitable process selection, time, distance, shielding, containment and engineered interlocks. These principles require

competent design. The inverse-square relationship can apply approximately to an unshielded point source in suitable conditions, but it is not a universal rule for every source, geometry or scattered field. Do not calculate a public exclusion distance from a generic formula in this book.

For non-ionising sources, consider enclosure, screens, interlocks, reduced exposure, suitable equipment selection and appropriate personal protection. Outdoor UV controls include work planning, shade and protective clothing. Laser systems require controls appropriate to their classification and use. Electromagnetic-field assessments must consider workers at particular risk as well as exposure criteria for the general workforce. [R1]

Evaluate the reliability of access controls and interfaces with contractors. Who confirms the area is clear? Who authorises the source or equipment to operate? What happens if an interlock fails? Who can declare an area released? A radiation warning sign is only one part of a controlled system.

Activity: prepare an evidence request for a contractor bringing radiography equipment to Northstar. Include authorisation and competence, source and task description, risk assessment, controlled area arrangements, monitoring, emergency arrangements and coordination. Do not request confidential medical records when competence and fitness-related assurance are sufficient.

03

MAINTAINING A SAFE WORKING ENVIRONMENT

Understand. Examine. Apply. Reflect.

Section 3 | Fire and explosion

LEARNING OUTCOME 3

Understand the maintenance of fire safety and protection against explosion.

Why this section matters: Fire and explosion can connect several familiar workplace weaknesses into a rapidly developing event. A material, an ignition source, a damaged barrier and an obstructed route may each need attention for different reasons. This section helps you understand those connections so that prevention, building protection, warning and escape are considered together rather than as separate checklist items.

What this section prepares you to do: By the end, you should be able to explain how common materials ignite, trace how fire and smoke may affect a building, and review the contribution of prevention and emergency arrangements. You will also be able to explain the limits of workplace firefighting and identify decisions that need competent specialist input.

Next reading: The earlier focus on exposure and control reliability now becomes a question about escalation: what prevents an event, and what protects people if it occurs?

AC 3.1 | How materials ignite

Official AC 3.1: Outline the ways that common flammable and explosive materials can catch fire.

Why this criterion matters: Fire prevention begins with understanding how an event could start. This criterion connects the properties and physical form of materials with the conditions that allow ignition or explosion, helping you avoid treating every combustible material in the same way.

What you are learning to do: You will learn to explain credible ignition pathways, distinguish key fuel properties and connect those explanations to prevention. You should be able to identify questions that need process or explosion specialists rather than relying on a simple fire model alone.

Understand the conditions for combustion

The fire triangle links fuel, oxygen and heat. It is a useful starting model: removing or controlling one element can prevent or interrupt combustion. Real fires also involve chemical reaction, heat transfer and changing fuel conditions. A solid, liquid or gas can contribute differently depending on its physical form and the environment. [D1, D2]

Flash point is the lowest temperature, under a specified test method, at which a liquid gives off sufficient vapour to ignite briefly when an ignition source is applied. Fire point concerns sustained burning under the relevant test conditions. Auto-ignition temperature is the temperature at which ignition can occur without an external flame or spark under specified conditions. These are different properties; none is a stand-alone safe operating temperature for every process.

Vapour density describes vapour density relative to a reference, commonly air. Vapours denser than air may accumulate in low places, but airflow and process conditions also matter. Flammability limits describe concentrations within which a fuel-air mixture can propagate flame under specified conditions. LEL and UEL refer to lower and upper explosive or flammable limits, not occupational exposure limits. The official indicative-content wording contains a terminology inconsistency here; use the correct technical distinction in your work.

Ignition sources and physical form

Naked flames, hot surfaces, electrical arcs, sparks, smoking materials, friction and electrostatic discharge can ignite suitable mixtures. A combustible material does not always burn in the same way in every form. Fine dust or atomised liquid can present a larger surface area and a different ignition or explosion risk from the bulk material. Dust dispersed in air can form an explosive cloud under suitable conditions; settled dust can contribute to secondary events.

Oxidising substances can intensify fire even when they are not themselves the fuel. Oxygen enrichment can make materials ignite more readily and burn more vigorously. Keep incompatible substances appropriately separated. Do not assess a store by checking only whether containers are marked flammable. [D1]

Explosion mechanisms

A vapour-cloud explosion involves ignition of a suitable vapour-air mixture; confinement and congestion can affect pressure development and consequences. A boiling liquid expanding vapour explosion, or BLEVE, involves the rapid release and expansion of a pressurised liquid above its atmospheric boiling point when containment fails. A BLEVE is not simply another name for any gas fire.

Maximum explosion pressure and rate of pressure rise are properties relevant to protection design under specified test conditions. Specialist engineers use appropriate data to design venting, suppression, isolation and containment. Learners should understand why the data matter, not attempt to size explosion relief from a brief example. An incorrectly directed relief device can transfer danger to people elsewhere.

Fictional Northstar example: decanting a flammable solvent increases the opportunity for vapour release and static generation. A sealed store’s previous assessment may not cover open transfer. Review the material, quantities, temperature, transfer method, ventilation, ignition sources and emergency arrangements before approving the change.

Activity: explain why keeping vapour below an explosive limit does not automatically control its health effects. A concentration can be below a flammability threshold and still exceed a health-based exposure limit. Fire protection and occupational hygiene must both be assessed.

AC 3.2 | How buildings and contents behave in fire

Official AC 3.2: Describe the behaviour of buildings and building contents in the event of a fire.

Why this criterion matters: Understanding ignition is only the beginning of a fire assessment. What happens next depends on the building, its contents and the routes through which heat and smoke can travel, including features altered during everyday maintenance or storage changes.

What you are learning to do: You will learn to explain how these features influence fire development and occupant safety. You will practise recognising why doors, walls, penetrations and storage arrangements need review as a connected system, with structural conclusions referred to competent specialists.

Fire development depends on fuel, ventilation, geometry, ignition and heat transfer. A simplified sequence includes ignition, growth, a developed phase and decay. The sequence is not a reliable clock for evacuation. Ventilation changes, hidden spaces, combustible linings and fuel arrangements can alter behaviour rapidly. People should not delay escape because a fire appears small. [D2]

Heat spreads by conduction through materials, convection through moving gases and radiation across space. Smoke and hot gases can move through openings, service penetrations and shafts. Smoke can impair visibility and contain toxic products. Tenability means conditions remain survivable for occupants; it depends on more than flame contact.

Compartmentation uses fire-resisting construction to limit spread for a designed period and purpose. Fire doors, walls, floors and properly sealed penetrations work as a system. Wedging a fire door open or leaving an unsealed service penetration can compromise that system. A door labelled fire-resistant is not effective if its installation, closer, seals or surrounding construction are unsuitable.

Materials respond differently to heat. Steel can lose strength as temperature rises; timber chars and burns depending on its properties and exposure; concrete can crack or spall. Connections, restraint, load and fire protection influence structural behaviour.

Do not predict a building’s collapse time from its main material alone. Fire-damaged structures require competent assessment before reoccupation. [B2]

Contents affect both fuel load and fire growth. Storage height, packaging, aerosols, batteries, liquids and the proximity of materials to heat sources can change risk. A warehouse reconfiguration can affect sprinkler performance, access and smoke movement. Fire precautions designed for the original occupancy may need review when the use changes.

Fictional Northstar example: a new cable passes through a compartment wall. The installer fills the gap with an unspecified material. The issue is not whether the gap looks neat; it is whether the penetration system maintains the required fire performance for that construction and service. Require appropriate design, installation evidence and inspection.

Activity: walk a fictional fire path from the decanting room to the rest area. Identify doors, walls, penetrations and escape routes that influence spread. Explain how one maintenance defect could affect several people beyond the room of origin. This develops a system view of fire safety.

AC 3.3 | Prevention, detection, protection and evacuation

Official AC 3.3: Explain the hazards, risks, and control measures in an organisation (including detection systems, alarm systems and evacuation procedures currently in use) for prevention and protection against fire and explosion.

Why this criterion matters: The preceding topics explain how fire starts and spreads. This criterion brings them into a workplace review, addressing the risk that an organisation relies heavily on alarms or evacuation while weaknesses in prevention and protection remain unresolved.

What you are learning to do: You will learn to explain the contribution of prevention, detection, alarms, protective measures and evacuation arrangements. You will practise linking each control to a hazard, identifying evidence of effectiveness and recognising gaps that affect the overall response.

Keep prevention and mitigation connected

Prevention reduces the chance of fire or explosion. Mitigation reduces consequences if an event occurs. A strong fire and explosion assessment includes both. Detection and alarms are important, but they do not remove an ignition source or stop an uncontrolled flammable release. Likewise, good prevention does not eliminate the need for escape arrangements. [D1, D2]

In Great Britain, DSEAR addresses risks from dangerous substances, including fire and explosion and certain other physical hazards. General fire safety duties have jurisdiction-specific legislation. England and Wales use the Regulatory Reform (Fire Safety) Order 2005 as amended; Scotland and Northern Ireland have different regimes. Identify location, premises and responsible persons before citing a duty. [D1, F2]

Control the release and ignition pathways

Consider eliminating or substituting dangerous substances, reducing quantities, using closed transfer, preventing leaks and providing suitable containment and ventilation. Assess incompatible materials and storage locations. Hazardous-area classification identifies where explosive atmospheres may occur and informs equipment selection and ignition control. A zone designation does not replace the duty to reduce the occurrence of explosive atmospheres.

Inerting reduces oxygen using an appropriate inert gas and engineered controls. It can prevent combustion in certain systems but introduce a fatal asphyxiation hazard. Purging and ventilation require assessed methods and monitoring. Do not teach people to enter a vessel because a flammable-gas reading is low: oxygen deficiency, toxic substances, isolation and confined-space risks may remain. [D1, CS1]

Explosion relief, suppression, isolation and containment require specialist design. They are not interchangeable accessories. The assessment should consider what happens downstream, where pressure or flame is released and whether a secondary event is possible. Maintenance and change control must preserve the design assumptions.

Detection and alarms

Detection systems should suit the likely fire, environment, occupancy and required response. Smoke, heat and other detectors have different characteristics. Dust, steam and normal processes can affect unwanted alarms or detection performance. Do not silence repeated unwanted alarms without investigating their cause and maintaining suitable protection.

An alarm must be recognised and acted upon by everyone who needs to respond. Consider noisy areas, hearing impairment, lone work, visitors and language. Visual or other arrangements may be required alongside audible warnings. Test and maintain systems under a suitable programme, and manage temporary impairments through assessed compensatory measures and timely restoration. [F2]

Evacuation and accountable response

Escape arrangements depend on occupancy, layout, fire development, travel, protected routes and the needs of occupants. Keep routes available during normal work, deliveries and maintenance. Plan assistance for people who need it, with their involvement. Avoid a plan that depends on an untrained colleague carrying someone down stairs without a suitable assessment.

Exercises should test realistic communication and decision-making without creating danger. A fast evacuation time alone does not prove success. Examine delayed areas, visitors, alarm recognition, accountability, route availability and whether people re-entered prematurely. Use the findings to improve the arrangements rather than punish individuals for exposing weaknesses.

Northstar evaluation

> Fictional evidence: Northstar has a maintained alarm system, but solvent decanting changed recently and contractors sometimes leave a fire door open. The alarm is a strength in warning, while prevention and compartmentation need review. Prioritise the changed process and door arrangements, then verify that the overall fire assessment reflects current operations. A new alarm panel alone would not address either weakness.

Activity: prepare a table with hazard, prevention, mitigation, evidence and gap. Populate one row for solvent transfer and one for a charging area. Explain why the same extinguisher or detector should not be selected automatically for both.

AC 3.4 | Safe firefighting decisions and egress

> Official AC 3.4: Outline the factors that must be considered to ensure safe and effective fire-fighting and egress in the event of different types of fire.

> **Why this criterion matters:** Even well-planned prevention needs an emergency response that puts people first. This criterion examines the decisions that matter when a fire occurs, particularly where uncertainty, unsuitable equipment or an unavailable escape route could make an attempted intervention dangerous.

What you are learning to do: You will learn to outline the factors affecting safe egress and limited firefighting within assessed arrangements. You should be able to explain why occupant needs, training, fire characteristics and reliable information for responders must shape the plan.

Egress means leaving a place safely. Firefighting arrangements must support life safety and fit the people, materials and premises. The presence of extinguishers does not create an expectation that every worker will fight a fire. People should raise the alarm, follow the emergency plan and avoid putting themselves at risk. Only appropriately trained people should attempt limited first-aid firefighting within the organisation's assessed arrangements. [F2]

Extinguisher selection depends on the fire and the agent's suitability. Water is not suitable for every fire, including situations involving live electrical equipment or certain reactive materials. Some agents introduce visibility, contamination or oxygen-displacement concerns. Use competent fire-safety advice, manufacturer information and the assessed premises risks rather than selecting by colour alone.

The escape route must remain available behind anyone attempting a permitted intervention. Rapid smoke spread, uncertainty about the substance, pressurised containers, suspected explosion risk or lack of an appropriate agent are reasons not to approach. Never teach learners to test an unknown fire with an extinguisher. Emergency services need reliable information about dangerous substances and site hazards.

Consider people with mobility, sensory or cognitive needs, temporary injuries, visitors and contractors. Emergency arrangements should not assume that everyone knows the building or hears an audible alarm. Refuge arrangements, where used, must form part of a complete evacuation strategy with communication and responsibility; they are not places to leave someone indefinitely.

Fire service access, water supplies, hazardous-substance information, isolation points and site plans can support the response. Keep information current and available in a safe way. Re-entry requires appropriate authorisation after the incident; cessation of visible flames does not establish electrical, structural or atmospheric safety.

Activity: a small fire starts near unknown chemical containers. Write the first management message in plain language. A sound answer prioritises alarm and evacuation under the plan, warns against approach, informs emergency responders of the unknown materials and prevents unauthorised re-entry. It does not instruct an untrained learner to select an agent by guesswork.

04

MAINTAINING A SAFE WORKING ENVIRONMENT

Understand. Examine. Apply. Reflect.

Section 4 | Hazardous substances and exposure

LEARNING OUTCOME 4

Understand safe storage, handling and management of hazardous substances, including biological agents.

Why this section matters: A substance may threaten health during an ordinary task even when there is no fire, spill or visible cloud. This section helps you move from recognising a hazardous material to understanding how people encounter it. It addresses a common weakness in workplace assessments: collecting labels and safety data sheets without examining the process, exposure routes or people who need protection.

What this section prepares you to do: By the end, you should be able to connect substance information with actual work, review storage and transfer arrangements, and explain a reasoned hierarchy of exposure controls. You will consider biological agents, asbestos, lead, personal protection and the effect of hazardous environments on electrical equipment, while recognising where specialist assessment is needed.

Next reading: Having considered how substances can fuel fire and explosion, now examine their journey through work and the ways they can reach and affect people.

AC 4.1 | Classification, exposure and health effects

Official AC 4.1: Outline how hazardous substances are classified and the effects of their exposure to human health.

Why this criterion matters: The first step in managing harmful exposure is understanding what is present and how it can reach people. This criterion addresses the limits of judging substances by appearance, smell or a product label, especially where work generates contaminants or involves biological agents.

What you are learning to do: You will learn to connect classification, physical form, exposure routes and possible health effects. You will practise using substance information to ask task-specific questions and identifying what a label or safety data sheet cannot establish by itself.

Identify the substance and the route

A substance hazardous to health may be a purchased chemical, a process-generated contaminant or a biological agent. Dust, fibre, fume, gas, mist, vapour and liquid describe physical forms, not levels of danger. Fume commonly consists of fine solid particles formed when a vaporised material condenses; vapour is the gaseous form of a substance normally liquid or solid at the relevant conditions. Confusing these terms can lead to unsuitable sampling or protection. [C1]

Exposure can occur through inhalation, ingestion, skin or eye contact and absorption, or injection through a puncture. Aspiration concerns material entering the airways, for example during swallowing or vomiting. The route affects which tissues receive the substance and what controls are required. Clean hands and separate eating areas matter because contamination can be transferred from surfaces to the mouth.

The respiratory system exchanges gases and can admit airborne contaminants. The circulatory system can distribute absorbed substances. The digestive system can admit swallowed contamination. The nervous system and organs such as the liver or kidneys may be affected by particular substances. Skin is a barrier but can also be damaged or

allow absorption. The body’s innate and adaptive defences do not make uncontrolled exposure acceptable.

Classification and information

Classification communicates intrinsic hazards using agreed categories. GHS is the Globally Harmonized System; applicable regional systems such as GB CLP give it legal effect within their scope. Hazard statements describe the nature of hazards, while precautionary statements describe prevention or response advice. A safety data sheet, or SDS, provides structured information but is not a workplace risk assessment. It cannot know every task, quantity, ventilation arrangement or worker exposure. [C3]

REACH concerns registration, evaluation, authorisation and restriction of chemicals within the applicable regime. EU REACH and UK REACH are distinct regulatory arrangements after EU exit. An organisation must identify the jurisdiction and its role, such as manufacturer, importer or downstream user. Do not assume an SDS from another market fully meets local requirements or reflects the latest restrictions.

Form, dose and duration

Inhalable dust is the fraction that can enter through the nose and mouth; respirable dust is the fraction capable of penetrating deeper into the gas-exchange region of the lungs. A respirable result and a total or inhalable result are not interchangeable. Solubility, particle size, reactivity and other properties influence where a substance deposits and how it behaves in the body. [C4]

Acute effects follow relatively short exposure; chronic effects develop over longer periods or repeated exposures. Some substances sensitise people, meaning later exposure can trigger a response in a sensitised person. Carcinogens can cause cancer; mutagens can cause genetic changes. Do not describe an exposure limit as a boundary between harmless and harmful for every individual or every effect.

Examples that connect substance to control

Carbon monoxide interferes with oxygen transport and can be produced by incomplete combustion. Isocyanates can cause occupational asthma and other effects, making suitable process control and exposure prevention critical. Metalworking fluids can present respiratory and skin risks, including risks from microbial contamination. Used engine oil can damage skin and presents additional hazards depending on its composition. [C5]

Respirable crystalline silica can cause serious lung disease. Wood dust can cause respiratory effects; some exposures are associated with cancer risk. Asbestos fibres can cause serious diseases after long latency. Lead can affect several body systems and may accumulate. These examples require substance-specific controls, not a single generic dust mask for all tasks. [C5, A1, L1]

Biological agents include bacteria, viruses, fungi and other organisms or associated materials that can cause infection, allergy or toxic effects. Assess the reservoir, transmission route, susceptible people and work activity. Cleaning, hygiene, containment, ventilation, safe sharps arrangements and appropriate occupational-health support may be relevant. A chemical label inventory alone will miss many biological risks. [C1]

Fictional Northstar activity: compare solvent decanting, warehouse dust and contaminated water in a maintenance task. Identify form, route, possible effect, evidence source and missing information. The purpose is to prevent exposure pathways, not merely label each item “chemical”.

AC 4.2 | Storage, handling and transport

Official AC 4.2: Explain the key standards for safe storage, handling and transport of hazardous substances in an organisation.

Why this criterion matters: Knowing a substance's hazards helps only if that knowledge follows it through the workplace. Receipt, storage, transfer, movement and disposal can each introduce a different opportunity for release, mixing, contact or loss of identification.

What you are learning to do: You will learn to explain the standards and arrangements needed across that journey. You should be able to identify compatibility, containment, information and responsibility gaps, while distinguishing internal movement from transport questions that require specific advice.

Safe management follows the substance through receipt, storage, use, transfer, internal movement, dispatch and disposal. Each stage can create a different release or contact pathway. Standards must be appropriate to the substance, container, quantity, compatibility and jurisdiction. A neat store is not necessarily a compatible store. [C1, D1]

Start with an accurate inventory and current substance information. Identify incompatible groups and conditions, such as oxidisers with combustible materials or substances that react dangerously with water. Segregation means maintaining suitable separation by an assessed arrangement; it is more than placing containers on different shelves. Bunding or secondary containment should be compatible and suitable for the credible release. Do not invent one universal bund percentage for every installation.

Bulk, intermediate and drum storage introduce different transfer and failure possibilities. Check container integrity, labelling, access, ventilation, impact protection, temperature and emergency arrangements. A decanted container needs clear identification and suitable design. Reusing a drinks bottle for a chemical creates an obvious misidentification risk even if the person filling it remembers the contents.

Transfer through pipelines, pumps or dispensing systems requires suitable materials, connections, isolation, flow control and maintenance. Filling and emptying can introduce static, splashes, vapour or pressure. Spraying changes droplet size and can increase inhalation and fire risks. An assessed closed process may reduce exposure, but cleaning and maintenance must also be considered.

Transport of dangerous goods has specific legal classification, packaging, labelling, documentation and competence requirements. Workplace internal movement and public-road transport are related but not identical regulatory questions. Loading and unloading tankers require coordination, prevention of unintended movement, appropriate connections and emergency arrangements. Use a competent dangerous-goods adviser where the duties require one. [DG1]

Waste retains hazards. Identify and segregate it, use suitable labelled containers, control storage and arrange lawful disposal. A spill response plan must match the materials and realistic quantities. Workers should know when to withdraw and call specialist support instead of attempting cleanup with an incompatible absorbent.

Fictional Northstar example: two products are individually stable but incompatible when mixed. A shared drain and common spill tray create a potential mixing pathway. The evaluation should examine credible leaks and drainage, not just shelf spacing. Activity: trace a container from delivery to disposal and identify where identity, containment or responsibility could be lost.

AC 4.3 | Assessing and controlling exposure

Official AC 4.3: Outline the features of effective risk assessment and measures of control for exposure to hazardous substances in line with the hierarchy of control.

Why this criterion matters: Good storage and handling are part of control, but an exposure assessment must also examine what people do during the task. This criterion addresses assessments that repeat substance information without showing who is exposed, how exposure occurs or why a control should work.

What you are learning to do: You will practise explaining an assessment based on actual work, applying the hierarchy of control and identifying suitable evidence of effectiveness. You should be able to recognise uncertainty and ask for appropriate occupational hygiene or health advice.

Assess the work, not just the chemical

A substance assessment should identify the hazard, how exposure occurs, who is exposed, the amount and duration, current controls and what further action is required. Include process-generated contaminants, bystanders, cleaners and maintenance workers. The assessment must describe actual tasks rather than copy the SDS into a form. In Great Britain, COSHH applies to many hazardous substances, while asbestos and lead have separate specific regimes. [C1, C2]

Use the hierarchy of control. Eliminate the substance or hazardous task where practicable; substitute a less hazardous option; use an alternative process; enclose or segregate; capture emissions; improve work systems; and use suitable personal protection for remaining exposure. Substitution requires assessment because the alternative can create a different health, fire or environmental hazard.

Local exhaust ventilation, or LEV, captures contaminated air close to the source. Its effectiveness depends on capture geometry, airflow, the process, maintenance and user behaviour. A running fan is not proof of capture. Commission the system against a defined purpose, provide usable indicators and instructions, inspect and maintain it,

and arrange required examination and testing. Workers need to understand positions or actions that defeat capture. [LEV1]

Evidence and uncertainty

Exposure monitoring measures relevant contaminants using an appropriate strategy. Personal sampling and static area sampling answer different questions. Short peaks may be missed by a long average; a quiet production day may not represent the highest credible exposure. Compare results with the correct substance, fraction, units, reference period and applicable exposure limit. State uncertainty and avoid false precision. [C4]

Biological monitoring may provide information about uptake for particular substances, while health surveillance seeks relevant early health effects. They are not interchangeable with air sampling. Use competent occupational-health and hygiene advice, consent and confidentiality arrangements appropriate to the method. Managers should use the information necessary to control work, not collect unnecessary private medical details.

Carcinogens, mutagens and respiratory sensitisers require particular attention to preventing or adequately controlling exposure under the applicable law. Enclosure, restricted access, effective cleaning, labelled closed containers and separation of eating and drinking can be important. Do not assume that a result below a limit ends the duty to reduce exposure where further control is required. [C2, C4]

Northstar control review

> Fictional teaching data: open solvent transfer lasts 20 minutes per batch, three times a shift. Workers report odour, but odour is not a reliable measure of safe concentration. Review substitution and closed transfer, then engineering controls and work methods. Obtain representative exposure evidence if needed for the decision. Verify the chosen control during filling, cleaning and maintenance, not only during a demonstration.

Activity: critique “Provide gloves and masks because the SDS says so.” A stronger answer identifies the exposure routes and prevention options, explains why engineering controls are selected, and specifies personal protection only after assessing the residual exposure and compatibility. Include how the control will be maintained and how failure will be detected.

AC 4.4 | Asbestos and lead

Official AC 4.4: Describe the control measures for working with asbestos and lead.

Why this criterion matters: The general approach to substance control needs careful application to asbestos and lead. Disturbing unknown material or allowing contamination to spread can undermine an otherwise routine maintenance or refurbishment task before workers recognise the problem.

What you are learning to do: You will learn to describe the management and control arrangements associated with these substances, including information before work, exposure prevention and specialist support. You should be able to recognise when work needs to pause for competent identification and assessment.

Asbestos: identify before disturbing

Asbestos may occur in older building materials, insulation, coatings and other products. Its presence cannot reliably be confirmed or excluded by appearance alone. Disturbing asbestos-containing material can release fibres. The correct response to suspect material is to avoid disturbance, protect the area and follow competent identification and management arrangements. [A1]

In Great Britain, the duty to manage asbestos in relevant non-domestic premises includes finding out whether asbestos is present, assessing condition and risk, preparing and implementing a management plan and providing information to people liable to disturb it. Survey purpose matters: a management survey and a refurbishment or demolition survey address different activities and levels of intrusion. A survey with inaccessible areas does not prove those areas are asbestos-free.

Work categories, licensing, notification and training requirements depend on the material and work. Do not assume that all asbestos work is either licensed or safe for a general contractor. Appropriate methods can include enclosure, controlled techniques, suitable extraction, RPE, decontamination and waste arrangements, specified by competent specialists. This book does not provide removal instructions.

Lead: control dust, fume and transfer

Lead exposure can arise in activities such as work on lead-containing materials, certain coatings, batteries or processes generating lead dust or fume. Inhalation and ingestion are important routes. Contaminated hands, food, clothing and surfaces can transfer lead beyond the immediate task. Assess the actual material and process rather than relying on a product name. [L1]

Control exposure through suitable process design, enclosure, extraction, hygiene and safe cleaning. Avoid dry methods that spread contamination where inappropriate. Provide suitable washing, changing and storage arrangements and prevent eating or drinking in contaminated areas. Occupational-health surveillance and biological monitoring may be required under the applicable regime, with decisions made by competent professionals.

Fictional Northstar example: refurbishment exposes an unknown older coating and suspect board. The contractor must not begin sanding and cutting while waiting for identification. Stop disturbing work, review the survey and substance information and arrange competent assessment. A dust mask handed out after work starts does not resolve the planning failure.

Activity: explain why an asbestos register is only useful if it is current, accessible and understood before work. Then identify how permit, purchasing and contractor processes can ensure the information reaches people who may disturb materials.

AC 4.5 | Selecting and managing PPE

> Official AC 4.5: Explain the factors to consider when choosing appropriate Personal Protective Equipment (PPE) and requirements for PPE in an organisation.

> **Why this criterion matters:** After considering how to prevent and control exposure, you need to understand the protection required for what remains. PPE can appear reassuring while failing to match the substance, task or wearer, so issue records alone tell you little about effectiveness.

What you are learning to do: You will learn to explain selection, fit, compatibility, maintenance and user needs. You should be able to identify the information required before choosing protection and describe how an organisation keeps it effective in use.

Personal protective equipment, or PPE, reduces exposure for the wearer when correctly selected, fitted, used and maintained. It does not remove the hazard. Start with prevention and engineering controls, then determine the remaining protection requirement. A single item may not protect against every substance, concentration or physical form. [P1]

Respiratory protective equipment, or RPE, includes filtering respirators and breathing apparatus. Filtering equipment removes specified contaminants from the air; it does not supply oxygen. Breathing apparatus supplies breathable air from an appropriate source. Oxygen deficiency, unknown atmospheres or particular high-risk conditions require specialist assessment and cannot be resolved by selecting a stronger particulate filter. [P2]

Assigned protection factor, or APF, describes a level of protection expected from a class of RPE when properly selected and used within a complete programme. It is not the same as a filter’s laboratory efficiency. Select the correct type of filter for the contaminant and task, establish change arrangements and consider exposure duration, work rate, temperature, communication and mobility.

Tight-fitting RPE requires an adequate seal and appropriate face-fit testing. Facial hair in the sealing area can prevent a reliable seal. Spectacles, head coverings and other PPE can interfere with fit. A suitable alternative may be needed rather than assuming one design fits everybody. Involve users and consider medical suitability through appropriate professional advice. [P2]

Gloves must suit the chemical and task. Breakthrough time concerns permeation under specified test conditions; it is not a universal guaranteed wearing time on site. Degradation, puncture, mixtures, temperature and dexterity affect selection. Eye and face protection must match splash, impact, optical radiation or other hazards. Compatibility matters: adding one item must not defeat another.

Manage PPE through procurement, individual selection, training, storage, inspection, cleaning and replacement. Train people to recognise failure and limitations. Record the rationale for selection, not merely that “PPE was issued”. Consider the employer’s legal provision duties in the relevant jurisdiction and do not shift required protection costs onto workers. [P1]

Fictional Northstar activity: select the information needed before specifying gloves and RPE for decanting. A good answer requests chemical identity, concentration, physical form, exposure evidence, task duration, other controls, wearer needs and manufacturer compatibility information. It does not choose a product from colour or brand recognition.

AC 4.6 | Electrical systems in hazardous environments

> Official AC 4.6: Explain the impact of hazardous work environments on the installation and use of electrical systems and equipment.

> **Why this criterion matters:** Hazardous substances and challenging environmental conditions also affect equipment around the task. Moisture, corrosion, dust or a potential explosive atmosphere can change whether an electrical installation is suitable and what could happen if it fails.

What you are learning to do: You will learn to explain how environment influences electrical selection, installation, inspection and use. You should be able to recognise changes that call for review and identify the questions requiring competent electrical or process-safety input.

An environment can change both the chance of electrical failure and its consequences. Moisture, corrosion, heat, dust, impact and explosive atmospheres affect selection, installation, maintenance and use. A system acceptable in an office cannot automatically be transferred into a washdown area or solvent process. [EL2, D1]

Review the strength and capability of equipment, insulation, protection and positioning of conductors, protection against shock and excess current, isolation, access and lighting. Suitable working space is part of safe maintenance. If access requires someone to stand in water or reach across exposed equipment, the problem is not solved by a training record.

In explosive atmospheres, equipment and protective systems must be appropriate for the assessed zone and substance characteristics. Selection involves more than an “explosion-proof” claim. Temperature, gas or dust group, installation details and maintenance can affect suitability. Competent design and inspection are essential. Ordinary electrical protection does not automatically prevent ignition of an explosive atmosphere.

The controls discussed in Section 1 remain relevant: suitable equipment, secure isolation, competent work, appropriate inspection and testing, and carefully controlled exceptional live work. Additional environmental conditions may change inspection

frequency, enclosure requirements, cable protection or access arrangements. A modification can invalidate the basis on which equipment was selected.

Fictional Northstar example: a new solvent-cleaning station is installed beside an ordinary switch and portable fan. The team should assess the release and potential hazardous area before accepting the equipment arrangement. Moving the fan slightly further away without a competent assessment is not a defensible control strategy.

Activity: create a change checklist for introducing a corrosive cleaning process. Include material compatibility, electrical protection, ventilation, containment, access, emergency arrangements and maintenance. Explain which decisions require specialist electrical and process-safety input.

05

MAINTAINING A SAFE WORKING ENVIRONMENT

Understand. Examine. Apply. Reflect.

Section 5 | Work equipment and machinery

LEARNING OUTCOME 5

Understand safe management of work equipment and machinery.

Why this section matters: Equipment can make a task easier while introducing hazards during operation, cleaning, adjustment or repair. This section helps you judge the complete working arrangement, including the machine, its safeguards, its users and its surroundings. The problem to solve is broader than finding a guard or a training record: it is understanding whether people remain protected throughout the equipment's working life.

What this section prepares you to do: By the end, you should be able to explain equipment selection criteria, distinguish protective functions, and review risk controls across operating states. You will also examine mobile equipment and lifting operations, identifying the planning, competence and verification needed to support a defensible safety judgement.

Next reading: The earlier sections considered working conditions, exposure and emergencies. Bring those ideas together now by following a piece of equipment from selection through use and change.

AC 5.1 | Selecting equipment for the task

Official AC 5.1: Explain the selection criteria for work equipment for specific tasks and processes in order to manage risk.

Why this criterion matters: Equipment decisions begin before a machine arrives. This criterion examines how choosing for production output alone can leave problems in access, cleaning, maintenance or interaction with the workplace, transferring avoidable difficulties to the people who use it.

What you are learning to do: You will learn to explain task-specific selection criteria and ask suppliers for useful evidence. You should be able to consider users, materials, energy and the equipment's full life when judging whether a proposed choice is suitable.

Work equipment includes machinery, tools and installations used at work. Selection should begin with the task and the users, not a supplier’s preferred product. Define what the equipment must do, the materials and energy involved, the working environment, intended output and foreseeable abnormal conditions. Consider its full life: delivery, installation, operation, cleaning, adjustment, maintenance, dismantling and disposal. [M1]

Suitability includes capacity, stability, guarding, controls, visibility, access, noise, vibration, emissions and the ability to maintain the equipment safely. Consider human dimensions and capabilities. A control that can be reached by one operator may be poorly placed for another; a display that is readable in a showroom may be difficult under site lighting. PPE can alter grip, hearing, vision and access.

Assess all energy sources, including electrical, pneumatic, hydraulic, mechanical, gravity, thermal and stored energy. Materials and by-products must be supplied and removed safely. A machine that performs its production task well may create unsafe cleaning, waste handling or jam-clearing tasks. Ask suppliers to explain these operations and provide suitable instructions.

Product conformity marking and documentation are relevant, but they do not prove that equipment is suitable for every workplace use or integration. Applicable marking rules depend on jurisdiction, market and equipment type. Verify current requirements rather

than assuming CE or UKCA alone establishes operational safety. Employers retain duties concerning safe use. [M1, M4]

For complex equipment, define acceptance criteria before purchase and commissioning. Include safety functions, access, emissions, isolation, documentation, training and maintenance needs. Involve operators, maintenance, engineering and safety personnel. Evaluate foreseeable misuse: if a routine jam tempts operators to defeat a guard, redesign or improved access may be necessary.

Fictional Northstar example: a faster packaging machine has a low purchase price but requires frequent manual clearing in a guarded zone. Compare lifecycle cost and risk with an alternative that avoids the blockage or provides a safer recovery method. Do not frame the decision as productivity versus safety when better design may improve both.

Activity: write five questions for a supplier, including one about isolation and one about cleaning. Strong questions ask for verifiable performance and safe methods rather than a general assurance that the machine “meets all standards”.

AC 5.2 | Control systems and protective devices

Official AC 5.2: Explain the key safety characteristics, including protective devices, of general workplace machinery control systems.

Why this criterion matters: Once equipment is selected, its controls and safeguards need to perform clearly defined functions. Confusing a normal stop, an emergency stop and isolation, or assuming any guard protects against every hazard, can leave important gaps in the safety arrangement.

What you are learning to do: You will learn to explain the purpose and limitations of common protective devices and control functions. You should be able to ask how protection works during access, faults and restart, and recognise when competent technical assessment is needed.

Understand what each device does

A control system directs machine operation. A safety-related control function reduces a defined risk, such as preventing hazardous movement when a guard is open. Its design must consider foreseeable faults, response time, stopping performance and the consequences of failure. An ordinary start-stop circuit is not automatically a suitable safety system. [M1, M3]

Fixed guards provide a physical barrier and normally require a tool for removal. Distance guards prevent reach by maintaining suitable separation. Interlocked guards connect guard position with machine operation; guard locking may be needed where dangerous motion persists after a stop command. Adjustable and self-adjusting guards can suit particular operations but depend on correct selection and use.

Trip devices detect entry or presence and initiate a protective response. Examples include light curtains, pressure-sensitive devices or other sensing systems suitable for the application. Their position must account for the time taken to stop the hazard and the speed of approach. A sensor fitted too close to a dangerous part may detect a person too late. Do not invent a separation distance without the relevant design method and validated stopping data.

Two-hand controls can help keep an operator’s hands away during a hazardous phase, but their design must prevent simple defeat and address the protection of other people. They do not automatically protect a second worker. Mechanical restraints, jigs and push-sticks can support safe handling in appropriate tasks; their use must be assessed within the overall safeguarding arrangement.

Stop, emergency stop and isolation

A normal stop ends operation in the intended way. An emergency stop is a complementary protective measure for emergencies; it is not a replacement for guarding. Isolation separates equipment from energy sources and controls stored energy for relevant work. Pressing an emergency stop does not necessarily isolate electricity, hydraulic pressure, gravity or stored motion.

Restart behaviour matters. Equipment should not restart unexpectedly following power restoration or guard closure where this would create danger. Resetting a protective device should not itself initiate hazardous movement unless the design safely permits it under the relevant requirements. Clear controls, appropriate visibility and deliberate start arrangements reduce foreseeable error. [M1]

Evaluate reliability in practice

> Look for defeated interlocks, damaged guards, blocked sensors, confusing controls and unreviewed software or hardware changes. Ask why bypassing occurs. A guard that makes routine cleaning impossible may create predictable pressure to defeat it; the solution should address design and method, alongside clear rules and supervision.

Fictional Northstar example: an operator uses tape to hold an interlock closed during repeated jams. Stop the unsafe use and arrange competent repair and assessment. Investigate the jam mechanism, clearing method and production expectations. Replacing the tape with a warning notice is not an adequate remedy.

Activity: explain the protection and limitation of a light curtain compared with a fixed guard. A light curtain can stop motion on detection but does not physically contain ejected fragments or hazardous substances. The appropriate safeguard depends on the hazard, not on which device looks more advanced.

AC 5.3 | Risk assessment, competence and the equipment lifecycle

Official AC 5.3: Explain the features of effective risk assessment and control measures for work equipment and machinery, including the skills, training and supervision to install, test, maintain and operate equipment.

Why this criterion matters: Safeguards must remain effective beyond normal production. This criterion addresses the less routine activities, changes and handovers where equipment hazards can be overlooked, and the different capabilities needed to operate, install, test or maintain the same machine.

What you are learning to do: You will practise explaining a lifecycle risk assessment that links operating states, exposed people, energy and controls. You should be able to identify suitable evidence of competence, supervision and safe return to service without treating attendance at training as sufficient assurance.

Assess every operating state

Machinery risk assessment considers people exposed, severity, probability, frequency and duration of exposure, access needs and safeguard reliability. Include normal operation, setting, cleaning, jam clearing, fault finding, maintenance and decommissioning. Many serious exposures arise outside the intended production cycle. [M1, M3]

Mechanical hazards include crushing, shearing, cutting, entanglement, drawing-in, impact, abrasion, puncture and ejection. Non-mechanical hazards include electricity, noise, vibration, temperature, radiation, substances and ergonomic demands. A guarded rotating shaft does not resolve a harmful fume release or excessive noise. Assess the machine within its actual environment.

Different equipment creates different exposure patterns. A drill can entangle or catch material; a circular saw can cut or eject; a guillotine can shear; abrasive wheels can break; a lathe can entangle; presses can crush; automatic gates can trap; CNC machines and robots can create unexpected movement during access. Use competent machine-specific assessment rather than a generic list alone.

Integrate safety throughout life

Safety integration means designing out or reducing risks first, applying protective measures for remaining risks and informing users about residual risk. Consider transport, assembly, disabling and scrapping as well as normal use. Technical information, declarations and conformity assessments can support the review, but must be connected to the actual configuration. ISO 12100 provides a recognised risk-assessment and risk-reduction framework; standards are not automatically law in every jurisdiction. [ISO1]

Plan isolation for all energy sources and stored energy. A raised part may fall after electrical isolation; an accumulator may retain pressure; a heated surface may remain dangerous. The method must define how a safe state is established and maintained. This requires competent equipment-specific procedures, not a universal lockout checklist copied without understanding.

Competence, instruction and supervision

Competence combines relevant knowledge, skills and experience with the ability to apply them safely. A person competent to operate a machine may not be competent to modify its safety system. Define authorisations for installation, testing, maintenance, operation and specialist work. Provide supervision proportionate to risk and experience, including new workers and unusual tasks.

Training should include demonstrated practice, fault recognition, stop-work decisions and safe recovery. Assess understanding in a language and format the person can use. A signed attendance sheet records attendance, not demonstrated competence. Refresher support should follow changes, observed gaps and the demands of the task.

Pressure systems

Pressure systems store energy that can be released violently on failure. Safe operating limits, suitable design, protective devices, maintenance and examination are essential. In Great Britain, qualifying systems require a written scheme of examination and examination by a competent person under the Pressure Systems Safety Regulations. The scheme identifies what is examined, how and when; it is not simply a maintenance calendar. [PS1]

Repairs and modifications can affect integrity and must be reviewed appropriately. Keep information, marking and records current. Do not assume that a small compressor

is exempt without checking the scope, pressure, relevant fluid and system particulars. Managers should know who maintains the system and who provides independent competent examination where required.

Northstar application

> Fictional teaching example: Northstar has an operator training matrix, but contractors perform maintenance without a documented handback check. A stronger system verifies the machine configuration, safeguards, tools removed, isolation release and authorised return to service. Involve operations and maintenance so the machine does not return to production with a temporary bypass still active.

Activity: develop an assessment covering production, cleaning and jam clearing for one fictional packaging machine. For each state identify the exposed person, energy, safeguard, competence and evidence. Finish with the highest-priority improvement and explain why it outranks a lower-consequence housekeeping issue.

AC 5.4 | Mobile work equipment

Official AC 5.4: Outline the main hazards and control measures associated with mobile work equipment.

Why this criterion matters: Mobile equipment adds movement and changing surroundings to the machinery assessment. Its stability, visibility, attachments and interaction with pedestrians can alter as the task changes, so a general operator certificate or familiar vehicle name cannot answer every safety question.

What you are learning to do: You will learn to outline the main hazards and explain equipment, layout and management controls. You should be able to identify the information needed to review a particular vehicle, task and workplace combination, including unfamiliar attachments or conditions.

Mobile equipment can overturn, roll over, strike people, trap them against fixed objects or shed loads. Passengers may fall or be crushed. Excessive speed, poor stopping performance, limited visibility, unsuitable surfaces and unauthorised use can increase risk. Refuelling and charging introduce additional chemical, electrical and fire hazards. [M1, T1]

Assess the equipment type and task. Counterbalance, reach, rough-terrain, telescopic and pedestrian-controlled trucks have different characteristics. Agricultural tractors, works vehicles, towed equipment and remotely controlled machines require their own consideration. The name forklift does not describe every stability or control limitation.

A safe operating position, appropriate rollover or falling-object protection, restraints where required, guards and suitable braking can reduce risk. Protection must be compatible with the equipment and intended use. Visibility aids such as mirrors, cameras, radar or other detection systems can help, but blind spots and reliance on human response may remain. Do not use technology as a reason to abandon suitable segregation.

Attachments can change load centre, capacity, visibility and stability. Obtain the correct compatibility and rated-capacity information. Lifting people with a truck requires a specifically assessed suitable arrangement and equipment; improvised pallets or ordinary forks are not a work platform. Prefer equipment designed for the task where appropriate. [M2]

Operator development includes basic training, specific job training and familiarisation with the workplace and equipment. Authorisation should follow competence, not merely possession of a generic certificate. Review contractors and visiting operators as well as employees. Pre-use checks, defect reporting and removal from use should be practical and enforced.

Fictional Northstar example: a truck with a new attachment continues to use the original capacity information. The assessment must review the combination before use. A lower travel speed does not correct an unknown lifting capacity. Activity: identify three engineering or layout controls and two management controls for a busy loading area, explaining the limitation of each.

AC 5.5 | Lifting equipment and lifting operations

> Official AC 5.5: Outline the main hazards and control measures associated with lifting equipment.

> **Why this criterion matters:** Lifting brings equipment, loads, people and the surrounding area into one coordinated operation. This final criterion addresses the weakness of judging a lift by load weight or an examination record alone when configuration, condition and planning also matter.

What you are learning to do: You will learn to outline key lifting hazards and the contribution of suitable equipment, competent planning, supervision and checks. You should be able to explain why changed conditions require review and distinguish operational checks from maintenance and thorough examination.

Lifting equipment includes cranes, hoists, passenger and goods lifts and other equipment used to lift or lower loads. Hazards include dropped loads, overturning, structural failure, trapping, falling people and contact with nearby structures or services. A lifting operation is a coordinated activity, not simply the movement of a hook. [M2]

In Great Britain, LOLER requires lifting operations to be properly planned by a competent person, appropriately supervised and carried out safely. The planning detail should be proportionate to the operation. Routine, simple lifts and complex lifts do not need identical paperwork, but both need adequate planning and suitable equipment.

Select equipment for the load, configuration, reach, environment and ground conditions. A crane’s rated capacity changes with configuration and radius. Ground bearing, outriggers, nearby excavations, wind and load behaviour can be critical. Do not derive a safe lifting plan from weight alone. Competent planning must consider the whole operation and foreseeable changes.

Accessories such as slings and lifting beams need suitable identification, capacity, compatibility and condition. Sling angles can affect forces; sharp edges, heat and chemicals can damage accessories. Exclude people from dangerous areas and prevent people working beneath suspended loads except within specifically controlled

arrangements where unavoidable and lawful. Clear communication and agreed signals are part of the plan.

Maintenance, inspection and thorough examination have different purposes. Under LOLER, examination intervals are normally six months for lifting people and lifting accessories and twelve months for other lifting equipment, or according to a written examination scheme drawn up by a competent person, with additional requirements after exceptional circumstances where relevant. The actual scope and schedule must be checked for the equipment. An examination certificate does not replace daily condition checks or a safe lifting plan. [M2]

For passenger and goods lifts, review doors, landing protection, load limits, emergency communication and rescue arrangements. Construction hoists, vehicle lifts and MEWPs have different use conditions. A trained operator is not automatically competent to design a complex lift or perform a thorough examination.

Fictional Northstar example: a planned machine delivery is heavier than the previous one and must pass near an occupied route. Reusing the previous lifting plan without review is weak practice. Reassess load data, lifting points, equipment, ground, route, exclusion, supervision and contingencies. Activity: write the conditions that must be satisfied before the lift proceeds, and identify who has authority to stop it if conditions change.

Professional practice workbook

Turning reading into an assignment

Begin with the current centre-issued assignment brief. Make a coverage plan before drafting. Use one row per assessment criterion, with columns for the command word, required subject, organisational evidence, source, proposed argument and remaining gap. This prevents an attractive report from overlooking a small but essential requirement. A criterion that lists several contexts requires evidence across those contexts, not only the one that is easiest to discuss.

The December 2023 specification gives approximate assessment lengths of 1,000 words for LO1, 500 for LO2 and 1,000 each for LO3, LO4 and LO5. These are assessment guidance figures, not chapter lengths or permission to omit criteria. Confirm the current brief and centre instructions where the breadth of a task makes the approximate length difficult to interpret. The depth of this teaching book is intentionally greater than a submission. [O1]

Keep the distinction between learning and assessment clear. This book supplies concepts, examples and questions. Your assignment should show your own application, evidence and judgement. Use the fictional case only if the brief permits it, and label it as fictional. Do not present a model observation as if you inspected your employer’s site. Where access is limited, state the limitation and agree an acceptable evidence route with the centre.

Command words in plain language

Outline: identify the main features and explain their significance briefly and clearly. Describe: give an accurate account of what something is like or how it operates. Explain: connect the why and how, including the mechanism between a condition and its consequence. Justify: defend a choice with evidence and reasons, recognising alternatives. Assess: examine information systematically and determine significance. Review: examine current arrangements against a defined scope and evidence. Evaluate: make a supported judgement about adequacy, strengths, limitations and improvement.

Description is necessary but often insufficient. “The store has ventilation” describes an arrangement. “The ventilation extracts near the emission source” begins to explain its

purpose. “Capture appears unreliable during container changes, based on observations and the commissioning record” analyses a limitation. “A redesigned transfer connection and verified capture should take priority over additional general fans” is a reasoned recommendation. The final claim still needs competent technical verification.

A paragraph that shows professional judgement

> Fictional teaching sample: “Northstar’s planned portable-equipment checks are a useful part of maintenance, but three reported cable defects in the dispatch route suggest the existing arrangements do not prevent recurring mechanical damage. The records establish inspection completion, while the observed routing explains a continuing exposure pathway. Defective items should remain out of use pending competent assessment. The organisation should review cable routing and equipment selection, then verify the change during peak dispatch operations. This conclusion is limited to the sampled equipment and does not establish the condition of every installation.”

Notice the structure: strength, evidence, limitation, mechanism, action, verification and scope. The paragraph neither ignores good practice nor lets it conceal the defect. It avoids claiming a legal conclusion beyond the available evidence. Use this structure as a thinking aid, not a paragraph to copy unchanged.

Evidence that can support your work

Useful evidence can include current procedures, inspection findings, maintenance records, examination reports, risk assessments, training and competence records, commissioning information, exposure measurements, interviews and direct observations. Each source has limitations. Documents may be outdated; observations may cover only one shift; workers may describe exceptional rather than typical conditions; measurements may have uncertain representativeness.

Triangulation means comparing different kinds of evidence addressing the same question. For example, compare the written isolation procedure, an observed authorised maintenance task and the competence/permit records. Agreement strengthens confidence; disagreement identifies a question to investigate. Do not average away a serious contradiction. A strong procedure does not cancel an observed unsafe practice.

Protect identities and commercially sensitive information. Use anonymised extracts where appropriate and obtain required permission for photographs and records. Redact

personal medical information and unrelated data. Record the source, date and scope so the assessor can understand the evidence without receiving unnecessary private information.

Build a reference trail

Place a citation close to the factual or legal claim it supports. Identify the organisation, document title, date or edition where available, page or section and URL for online sources. Distinguish the publication date from the date a webpage was updated. A current webpage can link to an older, still-relevant publication. Check whether legal amendments or later guidance affect the point you are making.

Do not cite a source merely because its title sounds authoritative. Confirm that it supports the claim. When using standards, identify the exact standard and edition and do not claim to have read inaccessible clauses. Public ISO summaries can support a statement about a standard’s purpose; they cannot substantiate a detailed clause interpretation you have not verified. ILO codes and OSHA materials provide useful international perspectives but do not automatically create duties in another jurisdiction. [ISO1, ILO1, ILO2, ILO3]

How to interpret the tables you meet at work

Inspection table

An inspection table records what was checked and found. Before interpreting it, establish the scope: which assets, areas, tasks and dates are included? “No defects” may mean none were observed within a limited visual inspection, not that every possible defect was excluded. Check competence, access limitations and whether the inspection was performed during representative conditions.

Fictional teaching data: 48 of 50 scheduled inspections are complete. Completion is 96%, calculated as 48 ÷ 50 × 100. That number says nothing about the seriousness of the two overdue items. If they are critical lifting examinations, their significance may be much greater than two low-risk administrative checks. Report the rate alongside consequence, priority and overdue duration.

Risk table

A risk table should describe a hazard pathway, people exposed, existing controls and further action. A numerical matrix can help organise discussion, but numbers are often judgement categories rather than measured probabilities. Multiplying categories does not create scientific precision. Explain the evidence and reasoning behind the rating, and apply immediate-action rules for serious hazards separately from score ranking.

Fictional teaching example: a damaged rack is assigned a low likelihood because collapse has not occurred before. This reasoning is weak: absence of previous collapse does not establish present capacity after impact. The assessment needs competent evidence and protective action. A matrix should not be used to downgrade uncertainty into reassurance.

Exposure table

An exposure table needs the contaminant or physical agent, measurement method, units, averaging time, location or person, task and date. Check whether a result is a personal exposure, an area measurement or a source emission. They answer different questions. Record whether production was typical and whether the measurement captures short-term peaks.

Fictional teaching data: an air sample gives a result of 0.8 in an unspecified unit. No meaningful comparison is possible until the unit, substance and reference period are known. Even a correctly reported result needs an appropriate benchmark and interpretation of uncertainty. Never compare mg/m³ directly with ppm without the necessary substance-specific conversion and conditions.

Corrective-action table

An action table should connect a finding to an owner, deadline, interim control and evidence of completion. Add an effectiveness check: what observation or measurement will show that the change worked? “Training delivered” is an output. “Workers can demonstrate the revised method and observed exposure is reduced” is closer to evidence of effectiveness.

Avoid assigning every action to the safety officer. Operations, facilities, engineering, purchasing and management own many controls. The safety professional advises, coordinates and challenges, but cannot personally maintain every system. Use clear authority and escalation for overdue actions.

Technical atlas: terms that deserve a second look

Noise engineering terms

Sound reduction index describes a construction’s ability to reduce sound transmission under specified conditions. An absorption coefficient describes how much incident sound energy is absorbed rather than reflected by a material under the relevant test conditions. Both vary with frequency and installation. Neither should be read as a universal percentage reduction in worker exposure.

Diffusion scatters sound energy rather than necessarily removing it. Acoustic enclosures reduce sound escaping from a source when designed with suitable openings, ventilation, access and material properties. An acoustic haven provides a quieter refuge for people, but only protects them while they use it. Active noise cancellation generates an opposing sound field and is effective only within suitable technical conditions; it is not a universal solution to all industrial noise. [N2]

Handling and posture tools

NIOSH is the US National Institute for Occupational Safety and Health. Its manual-material-handling resources support systematic consideration of task design. A checklist can prompt review but is not interchangeable with the Revised NIOSH Lifting Equation or a complete ergonomic assessment. RULA, the Rapid Upper Limb Assessment, is a screening method for posture-related concerns. It highlights the need for action; it does not diagnose an individual’s disorder.

The HSE DSE assessment checklist helps examine screen-work arrangements including equipment, furniture, the environment and the task. The indicative content refers to a VDU checklist; VDU means visual display unit, an older term often used for a screen. Check current HSE resources rather than assuming an old appendix reference is the only available method. [MH2]

Electrical protective concepts

An earth-free environment is a specialised protective concept involving separation from earth and exposed conductive parts under carefully controlled conditions. It is not a general workplace instruction to remove protective earth connections. Never disconnect an earth to stop nuisance tripping or to create an improvised “earth-free zone”. Protective arrangements require competent design and maintenance. [EL2]

Excess-current protection addresses currents that can exceed safe system capability. Isolation addresses separation from energy sources for work. Earthing, bonding, insulation, enclosure and residual-current protection address different parts of the failure pathway. Understanding their separate functions prevents the common mistake of assuming one device provides complete protection.

Chemical information systems

The International Programme on Chemical Safety has involved WHO, ILO and UNEP in international chemical-safety work. Concise International Chemical Assessment Documents, or CICADs, are technical assessments that can support understanding of particular chemicals. The International Chemical Safety Cards provide concise safety information. These resources supplement, rather than replace, current supplier information, applicable classification and a task-specific assessment. [ILO2]

The phrase “skin pervasion” appears in the indicative content; in professional writing, describe dermal absorption or skin penetration accurately for the substance. Explain the route rather than repeat an unfamiliar phrase without understanding it. Similarly, identify whether a document’s “LEL” refers to a lower explosive limit; do not confuse it with an exposure limit for health protection.

Machinery standards and conventions

ILO Convention No. 119 concerns guarding of machinery. A convention’s legal effect depends on ratification and national implementation; citing it does not replace identifying the applicable local duties. ISO 12100 describes general machinery risk assessment and risk reduction. The indicative content also refers to ISO/TR 14121; verify the exact part, edition and current status before using a detailed technical provision. This book does not reproduce paid standard clauses. [ISO1, ILO3]

Anthropometric design considers body dimensions and variation. Human reliability concerns the likelihood of successful human performance in a particular system, not a

fixed personality trait. Control layout, visibility, work pressure, feedback and maintenance access influence performance. A machine should not depend on perfect attention to compensate for an avoidable design hazard.

Northstar decision workshop

All data in this workshop are fictional. You are preparing a management meeting, not performing an actual engineering assessment. Northstar has identified six issues: glare at a labelling bench; late-shift gaps in first-aid cover; repeated cable damage; an impacted rack; open solvent transfer; and bypassing of a packaging-machine interlock.

Step 1: separate immediate protection from improvement

First identify conditions where continued use or exposure should stop pending competent assessment. Damaged electrical equipment, a potentially compromised rack and a defeated protective interlock require protective action; do not wait for the next routine meeting. The exact extent of restrictions depends on the evidence and competent advice. Immediate controls should be recorded, communicated and maintained until authorised release.

Then plan improvements that address causes. Cable rerouting, safer stock access, suitable transfer design and a reliable jam-clearing method may reduce repeated failures. Welfare and first-aid arrangements need practical coverage across working hours. Avoid assuming that every issue can be closed by a toolbox talk.

Step 2: define the evidence gap

For glare, observe the task and lighting conditions. For first aid, review the needs assessment and shift cover. For cables, trace damage mechanisms and maintenance. For the rack, obtain competent assessment. For solvent transfer, review substance, release, ignition and exposure information. For the interlock, obtain machine-specific assessment and investigate why bypassing occurred.

This step protects against premature solutions. Buying brighter lights before investigating glare may worsen the task. Buying another extinguisher before assessing vapour release may leave the main risk unchanged. A professional recommendation explains what decision can be made now and what must wait for additional evidence.

Step 3: assign ownership and verification

Issue	Proposed owner role	Verification question
Bench glare	Facilities with operators	Can labels be read reliably through the full work cycle?
First-aid cover	Operations with competent adviser	Is suitable cover available on every shift and during absence?
Cable damage	Engineering and dispatch	Is the damage mechanism removed during peak activity?
Rack impact	Warehouse and competent specialist	Are restrictions removed only after authorised resolution?
Solvent transfer	Process engineering and safety	Are exposure and ignition risks controlled during all stages?
Interlock bypass	Engineering and production	Is safe operation and jam recovery practical and verified?

The role names are teaching suggestions. Actual responsibilities depend on the organisation. Name one accountable decision-maker for each action and explain how specialists contribute. Do not confuse consultation with transferring responsibility to workers.

Step 4: communicate a balanced conclusion

Suggested briefing: “We have working arrangements worth retaining, including planned inspections and a reporting route. The findings show that several controls are not reliable under current operating conditions. We have restricted the affected activities while competent assessments are arranged. Our improvement plan addresses the causes, assigns operational ownership and verifies results before closure. I will report both completed actions and evidence that the changes are effective.”

This is stronger than “We found six issues and will train everyone.” It explains the relationship between evidence, protection and improvement. It also avoids declaring the whole organisation safe on the basis of limited information.

Final reasoning assessment

Question 1: a room-volume calculator returns a capacity estimate. What must still be assessed? Discussion: usable space, work tasks, furniture, circulation, ventilation, accessibility and fire/escape arrangements. The calculation is a limited screening aid.

Question 2: a worker says an electrical tool was tested last week, but its cable is now damaged. What matters most? Discussion: current condition. Remove it from use through the safe defect process and arrange competent assessment; a previous result cannot override new damage.

Question 3: a building inspection shows no visible defects, but a heavy machine is being installed. Is another review necessary? Discussion: the proposed loading and installation are a change. Verify structural suitability and associated access, fire, service and operational effects before installation.

Question 4: noise exposure is reduced by issuing hearing protection. Has the hierarchy been satisfied? Discussion: evaluate source and engineering controls, their practicability and the remaining exposure. Hearing protection may be necessary, but its issue alone does not establish a complete control programme.

Question 5: a flammable atmosphere test is below the LEL. Does that make a vessel safe to enter? Discussion: no. Oxygen, toxic substances, changing atmosphere, isolation, access, task hazards and rescue must also be assessed under a competent entry system.

Question 6: an SDS recommends gloves. Can any chemical glove be used? Discussion: no. Suitability depends on the substance or mixture, material compatibility, exposure, duration, physical demands, wearer needs and manufacturer information.

Question 7: an emergency stop is functional. Can it replace a missing guard? Discussion: no. It requires a person to recognise and react to danger and does not provide the preventive function of suitable guarding.

Question 8: all corrective actions are marked complete. What evidence would give confidence? Discussion: verified implementation, operation under representative conditions, user feedback, relevant measurements and follow-up showing that the original failure pathway has been addressed.

Use the following self-review, without treating it as an official grading scheme: have you identified the mechanism of harm, connected evidence to a suitable standard, acknowledged uncertainty, selected proportionate controls and explained verification? If one element is missing, revise the reasoning before polishing the wording.

Your next professional conversation

Choose one workplace issue that you previously described only as “unsafe”. Rewrite it as a specific account of the hazard, exposure, potential consequence, existing protection and evidence gap. Then explain the immediate action and the improvement that would address the cause. Ask a colleague to challenge the reasoning.

The purpose of this unit is not to make you recite every technical term. It is to help you recognise when a term matters, find reliable information, ask the right specialist question and make a defensible decision. Keep returning to the people doing the work. A safe environment is maintained through the connection between design, evidence, competent action and everyday use.

Appendix | Complete unit requirements

Learning Outcomes and Assessment Criteria use the supplied assignment wording, checked against the December 2023 specification. IC is presented as a teaching coverage map; read the linked original for exact OTHM indicative-content wording. Shared IC should not be mistaken for a one-to-one mapping to AC rows.

AC 2.1 list punctuation is normalised for readability. The official unit title is used here; the qualification structure uses the closely related “Safe Workplace Environment” title for the same code.

Open the official OTHM specification, pages 31-42

Section 1 | Requirements map

Learning Outcome	Assessment Criteria	IC teaching coverage
1. Understand the range of factors to consider to maintain a safe work environment.	1.1 Outline the critical factors when maintaining the working environment, ie temperature, light, space, ergonomics, lifts, access. 1.2 Justify the full range of welfare facilities that must be available in a workplace. 1.3 Explain the hazards and risks posed by electrics in an organisation 1.4 Review and evaluate control measures for electrics in relation to current legislation. 1.5 Assess the hazards and risks associated with the structural integrity of buildings. 1.6 Review and evaluate control measures for structural integrity in relation to current legislation.	Safe access and exit, signs, floor grip, footwear, cleaning and housekeeping Temperature, lighting, welfare and first-aid arrangements Weather, overloading, heat, corrosion, vibration, alterations, ground movement, design and workmanship Shock mechanisms: voltage, frequency, duration, resistance/impedance and current path Direct/indirect contact, fire, arc effects, static and ignition Portable tools, generators and welding; inspection/testing and cable routing

Shared across the learning outcome. Use the official specification and your current assessment brief together.

Section 2 | Requirements map

Learning Outcome	Assessment Criteria	IC teaching coverage
2. Understand the hazards, risks and controls applicable to a range of workplace contexts.	2.1 Evaluate the control measures in place within your organisation to control the following risks: temporary works; workplace transport; working in confined spaces; working at height; lone working; manual handling. 2.2 Outline the types of noise and vibration, the effects of being exposed to these, and their control measures. 2.3 Explain the measurement, assessment and methods to control exposure to noise and vibration. 2.4 Describe effects of being exposed to the different types of radiation. 2.5 Explain the measurement, assessment and methods to control exposure to different types of radiation.	Assessment of confined-space entry, height work and rescue, lone work and emergency communication Transport: site, routes, activities, vehicles, drivers and shared premises Handling, posture and repetitive tasks: MAC, ART, V-MAC, DSE, NIOSH MMH and RULA Noise and vibration effects, exposure assessment, limits and health surveillance Noise control at source, along the path and at the receiver; absorption, insulation, damping, isolation, diffusion, enclosure and active cancellation Hearing protection: frequency analysis, SNR/HML and over-protection; automation, maintenance, work organisation and PPE limitations Radiation effects, measurement and control are required by AC 2.4-2.5 even though the printed IC gives them little separate detail

Shared across the learning outcome. Use the official specification and your current assessment brief together.

Section 3 | Requirements map

Learning Outcome	Assessment Criteria	IC teaching coverage
3. Understand the maintenance of fire safety and protection against explosion.	3.1 Outline the ways that common flammable and explosive materials can catch fire. 3.2 Describe the behaviour of buildings and building contents in the event of a fire. 3.3 Explain the hazards, risks, and control measures in an organisation (including detection systems, alarm systems and evacuation procedures currently in use) for prevention and protection against fire and explosion. 3.4 Outline the factors that must be considered to ensure safe and effective fire-fighting and egress in the event of different types of fire.	Fuel properties, flash/fire points, auto-ignition, vapour density and flammability limits Ignition sources, fire growth/spread, vapour-cloud explosions and BLEVE Droplets, dust particle size, oxygen enrichment and oxidisers Atmosphere control, purging, inerting, hazardous zones, plant design and process control Separation, quantities, containment, ignition prevention, explosion protection and monitoring

Shared across the learning outcome. Use the official specification and your current assessment brief together.

Section 4 | Requirements map

Learning Outcome	Assessment Criteria	IC teaching coverage
4. Understand safe storage, handling and management of hazardous substances, including biological agents.	4.1 Outline how hazardous substances are classified and the effects of their exposure to human health. 4.2 Explain the key standards for safe storage, handling and transport of hazardous substances in an organisation. 4.3 Outline the features of effective risk assessment and measures of control for exposure to hazardous substances in line with the hierarchy of control. 4.4 Describe the control measures for working with asbestos and lead. 4.5 Explain the factors to consider when choosing appropriate Personal Protective Equipment (PPE) and requirements for PPE in an organisation. 4.6 Explain the impact of hazardous work environments on the installation and use of electrical systems and equipment.	Body systems and routes of entry; innate/adaptive defence; physical form and dust fractions Classification, labels, hazard/precautionary statements, GHS/CLP and REACH Carbon monoxide, isocyanates, metalworking fluids, used oil, silica, wood dust, asbestos and lead International chemical information; bulk/drum storage, compatibility, containment, transfer, dispensing, spraying, disposal and transport Elimination, substitution, alternative processes, enclosure, LEV, work methods, hygiene and emergency arrangements Carcinogen/mutagen controls; asbestos/lead methods and specialist arrangements RPE and breathing apparatus, filters/APF, oxygen, task/wearer factors, compatibility, fit, standards, eye/skin protection, storage, maintenance and training Electrical suitability in hazardous environments; protective systems, inspection/testing, competence, dead/live work and permits

Shared across the learning outcome. Use the official specification and your current assessment brief together.

Section 5 | Requirements map

Learning Outcome	Assessment Criteria	IC teaching coverage
5. Understand safe management of work equipment and machinery.	5.1 Explain the selection criteria for work equipment for specific tasks and processes in order to manage risk. 5.2 Explain the key safety characteristics, including protective devices, of general workplace machinery control systems. 5.3 Explain the features of effective risk assessment and control measures for work equipment and machinery, including the skills, training and supervision to install, test, maintain and operate equipment. 5.4 Outline the main hazards and control measures associated with mobile work equipment. 5.5 Outline the main hazards and control measures associated with lifting equipment.	Task/process/environment suitability and the safe supply/removal of energy and materials Ergonomics, anthropometry, controls, access prevention, barriers and separation Machinery risk-reduction standards and lifecycle safety integration People, injury severity/probability, exposure, safeguard reliability, foreseeable misuse and residual risk Conformity documentation, markings, integration and technical information Mobile plant: overturning, passengers, start-up, speed, stopping, moving parts, heat, refuelling and charging Truck types, attachments, lifting people, rollover/falling-object protection, restraints, vision aids and operator training Cranes, hoists, lifts, MEWPs: stability, competence, maintenance, inspection and examination Mechanical/non-mechanical hazards and safeguards: fixed/interlocked/automatic guards, trip devices, two-hand controls, restraints, jigs and push-sticks Pressure systems: limits, schemes, examination, maintenance, repair, records and competent persons

Shared across the learning outcome. Use the official specification and your current assessment brief together.

Primary sources and further learning

Reference links support verification and further study. HSE material includes law, Approved Codes of Practice and guidance; read the status stated in each document. ILO, OSHA and ISO resources provide additional frameworks and technical context. Accessed for this edition: 24 September 2026.

O1 OTHM. Occupational Health and Safety Level 6 specification, December 2023, unit pages 31-42

W1 HSE. Workplace health, safety and welfare (L24)

W2 HSE. Temperature: the law and managing temperature

W3 HSE. Ventilation in the workplace

W4 HSE. Lighting at work (HSG38)

W6 HSE. Thermal comfort

W5 HSE. Workplace welfare facilities

E1 OSHA. Ergonomics

S1 HSE. Slips and trips: flooring

F1 HSE. First-aid needs assessment

EL1 HSE. Electricity at work: safe working practices (HSG85)

EL2 HSE. Electricity at Work Regulations guidance (HSR25)

EL3 HSE. Work using electrically powered equipment

EL4 HSE. Portable appliance testing FAQs

B1 HSE. Structural stability during alteration, demolition and dismantling

B2 HSE. Design codes: buildings and structures

B3 HSE. Construction (Design and Management) Regulations 2015

TW1 HSE. Temporary works

T1 HSE. A guide to workplace transport safety (HSG136)

CS1 HSE. Confined spaces: legislation

H1 HSE. Working at height (INDG401)

LW1 HSE. Manage the risks of working alone

MH1 HSE. Manual handling at work

MH2 HSE. Toolkit for assessing musculoskeletal disorders

N1 HSE. Noise: employers' legal duties

N2 HSE. Controlling noise at work (L108)

V1 HSE. Hand-arm vibration regulations and calculator

V2 HSE. Whole-body vibration regulations

R1 HSE. Introduction to radiation in the workplace

R2 HSE. Ionising radiation: protecting workers and others

D1 HSE. Dangerous Substances and Explosive Atmospheres Regulations

D2 HSE. Dangerous substances and explosive atmospheres (L138)

F2 UK Government. Workplace fire safety: responsibilities

C1 HSE. COSHH assessment

C2 HSE. COSHH principles of good control practice

C3 HSE. Chemical classification, labelling and packaging

C4 HSE. Workplace exposure limits

C5 HSE. Hazardous substances and occupational disease

DG1 HSE. Carriage of dangerous goods

LEV1 HSE. Local exhaust ventilation

A1 HSE. Duty to manage asbestos

L1 HSE. Lead at work

P1 HSE. Personal protective equipment at work

P2 HSE. Respiratory protective equipment and fit testing

M1 HSE. PUWER overview

M2 HSE. LOLER overview

M3 HSE. Introduction to machinery safety

M4 HSE. Work equipment and machinery FAQs

PS1 HSE. Introduction to pressure equipment

ISO1 ISO. ISO 12100:2010 public overview

ILO1 ILO. Ambient factors in the workplace

ILO2 ILO. Safety in the use of chemicals at work

ILO3 ILO. Safety and health in the use of machinery

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