



Inovo Global Safety

Training & Advisory Services



Official Partners: OSH Tree Training & Consultancy Qatar

CSP EXAMINATION PREPARATION

DOMAIN 7

Training

Supplementary Learning Notes

Exam Weight: 10% of Total Score

Covering 6 Core Knowledge Areas

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DOMAIN 7 — TRAINING

CSP V11.0 Examination Preparation • Exam Weight: 10% • Blueprint Objectives 1–6

1. TRAINING NEEDS ASSESSMENT AND COMPETENCY REQUIREMENTS

1.1. Purpose and the Three-Level TNA Framework

A Training Needs Assessment (TNA) is a systematic process to identify gaps between current and desired performance and to determine whether training is the appropriate solution. Not every performance gap requires training — some result from unclear procedures, equipment deficiencies, or motivational issues that training alone cannot fix.

The Three-Level TNA Framework (McGehee & Thayer)

Level	Focus and Typical Tools
1. Organisational Analysis	Examines the organisation's goals, resources, climate, and where training is needed. Includes injury/incident data, OSHA citations, audit results, and safety culture assessments.
2. Task (Job) Analysis	Identifies the specific knowledge, skills, and attitudes (KSAs) required for each job. Tools: job observation, task decomposition, job hazard analysis (JHA), SME interviews.
3. Person Analysis	Determines who needs training and what kind, by comparing current KSAs against required KSAs using performance data, testing, and observation.

⚡ EXAM TIP

All three levels must be addressed for an effective TNA. A common CSP exam distractor lists only two levels, or substitutes an unrelated framework (e.g., Bloom's domains or Kirkpatrick's levels) — know that TNA specifically uses Organisational / Task / Person analysis.

1.2. TNA Data Sources and Techniques

A comprehensive TNA draws on multiple data sources and techniques, each with distinct strengths:

Data Source / Technique	Description and Advantage
Direct observation	Observing employees performing tasks in real time; reveals actual behaviour, including safety violations workers may not self-report.

Questionnaires	Structured surveys distributed to a large audience; enables quantitative comparison across departments or roles.
Consultation with SMEs	Engaging experienced employees or subject matter experts for insight into day-to-day task challenges.
Review of documents and literature	Examining job descriptions, SOPs, safety manuals, industry standards, and past training materials to align training with regulatory and organisational requirements.
Interviews	One-on-one or group discussions that allow in-depth clarification of knowledge or skill gaps.
Focus groups	Facilitated group discussions that generate collaborative, qualitative insight on training needs and organisational culture.
Tests	Written, oral, or practical tests providing objective data on current competency levels.
Records and reports	Incident reports, quality assurance/quality control data, and performance reviews that reveal recurring issues indicating training needs.

Additional recognised sources include: injury/illness records (OSHA 300 log), incident investigation root-cause findings, job hazard analyses (JHAs), worker surveys/interviews, observation and work sampling, regulatory requirements (OSHA standards mandating specific content), and competency assessments or supervisor performance appraisals.

1.3. Gap Analysis — Is Training the Solution?

The performance gap is the difference between the desired level of performance (the standard) and the actual performance observed. The TNA must determine the ROOT CAUSE of the gap before designing a solution:

- Skill/knowledge deficiency — training IS the appropriate solution.
- Lack of motivation or incentive — a management/reward system issue, not a training issue.
- Unclear expectations or procedures — a communication or procedure-design issue.
- Resource or environmental constraints — an engineering or administrative solution is needed instead.

⚡ EXAM TIP

A classic CSP exam trap: not every performance problem requires training. If a worker KNOWS how to do something safely but CHOOSES not to (e.g., because a supervisor discourages safe practices that slow production), training alone will not solve the problem — the intervention must address the reinforcement/management system. Regulatory TNA is different: OSHA standards specify required training content, frequency, and trainer qualifications, and these are non-negotiable regardless of root cause.

1.4. Training, Qualification, and Competency Requirements

Safety professionals must distinguish three related but distinct concepts when determining worker readiness:

Term	Definition
Competent Person	One capable of identifying existing and predictable hazards in the surroundings or working conditions, and who has authority to take prompt corrective action (OSHA usage, e.g., excavation, scaffolding).
Qualified Person	One who, by possession of a recognised degree, certificate, or professional standing, or by extensive knowledge, training, and experience, has demonstrated the ability to solve or resolve problems relating to the subject matter (OSHA usage, e.g., electrical work).
Authorised Person	A person approved or assigned by the employer to perform a specific type of duty (e.g., authorised employee under LOTO).

Competency Assessment Methods

- Knowledge assessments: quizzes, exams, oral questioning to evaluate theoretical understanding.
- Performance assessments: direct observation of tasks in real or simulated environments; practical demonstrations.
- Behavioural assessments: structured interviews or self-assessments evaluating soft skills (leadership, teamwork, decision-making).
- On-the-job assessments: shadowing employees during regular tasks; comparing performance against established benchmarks.

A comprehensive competency assessment framework combines self-assessment (employee reflection, fosters ownership) with manager/supervisor evaluation (job-specific insight), SME evaluation (technical proficiency), multi-rater/360-degree feedback (holistic interpersonal view), and formal assessment centres or Registered Training Organisations (standardised tests/simulations validating skills against industry standards).

Steps to Ensure Effective Competency Assessment

- Define standards: establish clear success criteria based on industry standards, job descriptions, and organisational goals.
- Use diverse methods: combine written, practical, and behavioural evaluations for a complete picture.
- Provide constructive feedback: highlight strengths and areas for improvement with actionable suggestions.

- Continuous reassessment: regularly evaluate and update competency levels to ensure sustained performance.

The ASTD/ATD Competency Model — Modern Trainer Competencies

The ASTD (now ATD) competency model describes the evolving role of the modern training professional, emphasising:

- Use of emerging technologies and acting as a facilitator rather than solely a lecturer.
- Fostering a culture of connectivity and collaboration; engaging learners in a variety of ways over time.
- Capturing knowledge from departing employees and transferring it to new hires (knowledge management).
- Playing a role in integrated talent management and anticipating the training and development needs of an increasingly global workforce.
- Using metrics to measure the effectiveness and efficiency of learning and development, and engaging business partners to support organisational strategy.

ATD/ASTD COMPETENCY MODEL FOR THE TRAINING & DEVELOPMENT PROFESSION

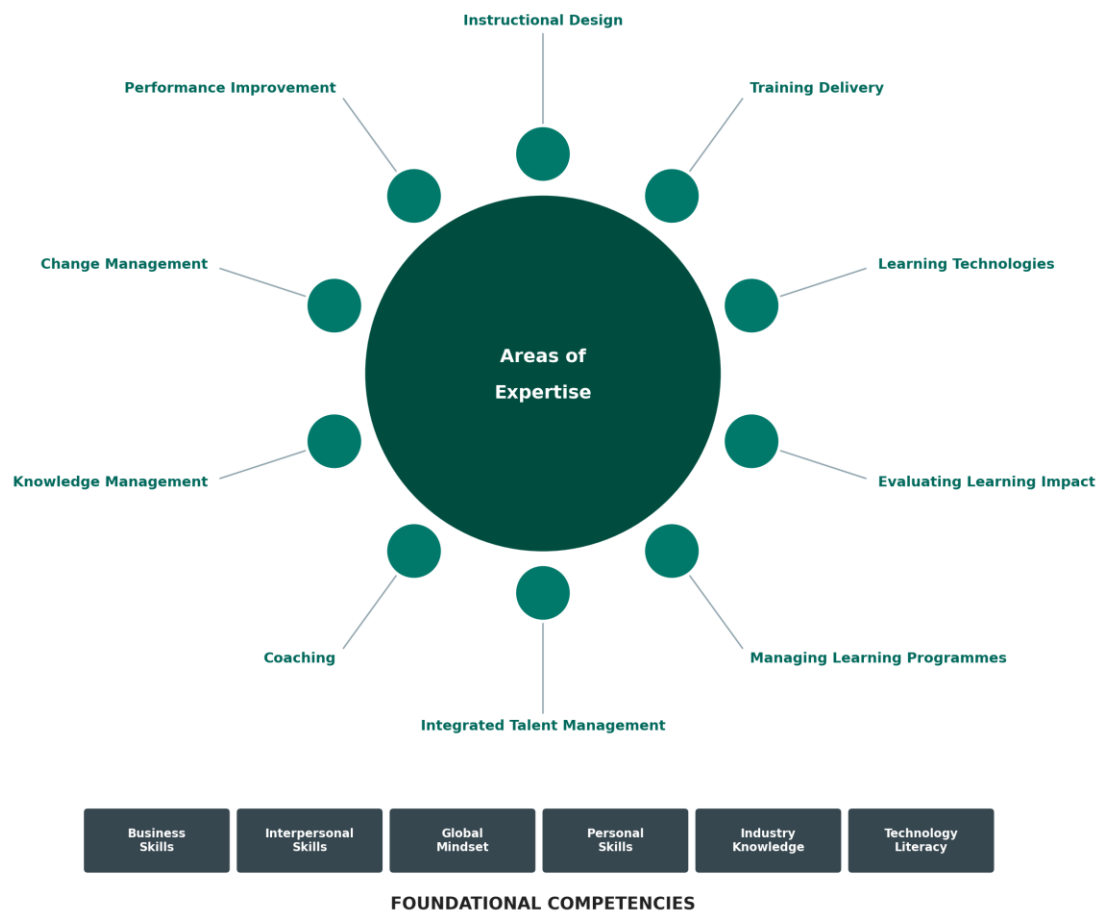


Figure 1.1 — The ATD/ASTD competency model, showing the ten areas of expertise built on six foundational competencies (original diagram, adapted from the ASTD Competency Model concept).

□ KEY REFERENCES

Brauer (Ch. 26): Safety Education and Training. Yates (Ch. 14): Training and Education — needs assessment. ANSI/ASSP Z490.1-2016: Criteria for Accepted Practices in Safety, Health, and Environmental Training. McGehee, W. & Thayer, P.W. (1961). Training in Business and Industry.

2. TRAINING PROGRAMME AND MATERIALS DEVELOPMENT

2.1. Writing Learning Objectives

Learning objectives (also called performance or terminal objectives) define what learners will be able to do at the end of training. They serve three critical functions: guide instructional design, specify assessment criteria, and communicate expectations to learners.

The ABCD Model for Objectives

ABCD Component	Definition and Example
A — Audience	Who will demonstrate the behaviour. 'The warehouse worker...'
B — Behaviour	Observable, measurable action (verb). '...will correctly don and doff a half-face APR...'
C — Condition	The circumstances under which the behaviour is performed. '...given the site's OSHA-compliant donning procedure and a P100 cartridge respirator...'
D — Degree	The standard of acceptable performance. '...with 100% of steps performed in correct sequence without prompting.'

Bloom's Taxonomy of Cognitive Learning

Bloom's Taxonomy (revised by Anderson & Krathwohl, 2001) organises cognitive learning objectives into six hierarchical levels, from simple recall to complex creation. Each level requires the thinking skills of the levels below it.

BLOOM'S TAXONOMY OF COGNITIVE LEARNING

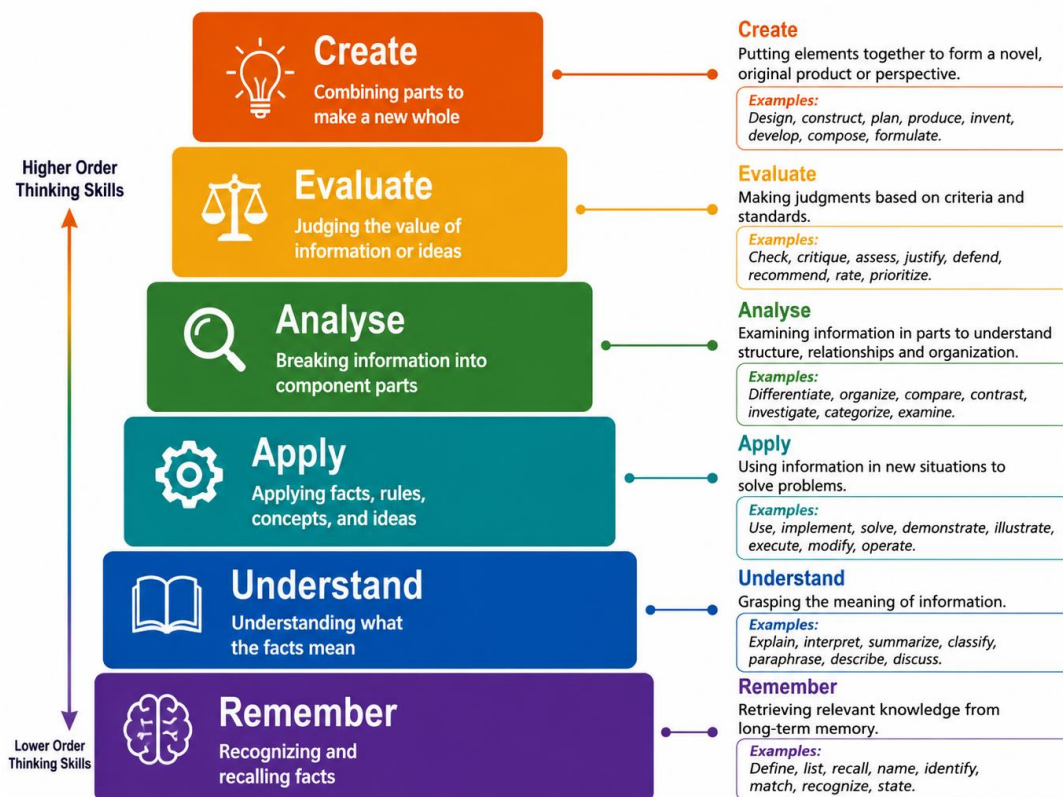


Figure 2.2 — Bloom's Taxonomy of cognitive learning, from Remember (foundational) to Create (highest order) .

Action Verbs by Bloom's Cognitive Level

Bloom's Level	Key Verbs (Keywords)	Example Learning Objective
Remember	define, list, recall, identify, name, state, match, quote, recognise	By the end of this session, the worker will be able to list the four required elements of an OSHA-compliant lockout/tagout procedure.
Understand	describe, explain, interpret, paraphrase, restate, summarise, discuss	By the end of this session, the worker will be able to explain, in their own words, why de-energising equipment prevents unexpected start-up.
Apply	demonstrate, calculate, perform, solve, use, illustrate, model, present	By the end of this session, the worker will be able to calculate the TWA exposure for a two-part work shift given sampling data.
Analyse	compare, differentiate, distinguish, examine, classify, break down, diagram	By the end of this session, the worker will be able to differentiate between a Class 3B and a Class 4 laser hazard based on a written scenario.
Evaluate	assess, critique, justify, recommend, select, judge, defend, argue	By the end of this session, the safety officer will be able to justify the selection of a specific respirator class for a given contaminant and concentration.
Create	design, develop, construct, formulate, plan, compose, generate, invent	By the end of this session, the supervisor will be able to design a task-specific JHA for a new confined space entry procedure.

Avoid non-measurable verbs in objectives: 'know', 'understand', 'appreciate', 'be aware of', 'learn'. These cannot be directly observed or measured.

⚡ EXAM TIP

The CSP exam often presents a written objective and asks whether it is correctly written. Key check: is the verb OBSERVABLE and MEASURABLE? 'Understand' = poorly written; 'Demonstrate' = well written. Objectives must align with evaluation — if the objective uses 'calculate', the assessment must include a calculation item.

2.2. Instructional Systems Design — The ADDIE Model

ADDIE is the most widely used instructional systems design (ISD) framework. It provides a systematic, phased approach to developing training programmes, and ANSI Z490.1 is closely aligned with the ADDIE process.

ADDIE Phase	Activities and Outputs
A — Analysis	Conduct TNA; define the problem; identify target population; analyse job tasks; identify constraints (budget, time, technology). Output: needs assessment report, design parameters.
D — Design	Write learning objectives; sequence content; select instructional strategies; plan assessment methods; create a design blueprint. Output: training design document/blueprint.
D — Development	Create instructional materials (slide decks, videos, job aids, quizzes); develop facilitator guides; build e-learning modules; pilot test. Output: course materials, assessment tools.
I — Implementation	Schedule and deliver training; train the trainers; manage logistics (room, equipment, participant notification); deliver pilot/full rollout. Output: completed training delivery.
E — Evaluation	Assess learner satisfaction, learning, behaviour transfer, and organisational results (Kirkpatrick); revise materials. Output: evaluation report, revision recommendations.

⚡ EXAM TIP

Per ADDIE and ANSI Z490.1, the Design phase begins with writing learning objectives AFTER completing the Analysis (TNA) phase. Objectives define what learners must be able to DO and drive all subsequent design decisions (content, methods, materials, assessment). Selecting a delivery format before objectives are written reverses the correct design sequence — a frequent exam trap.

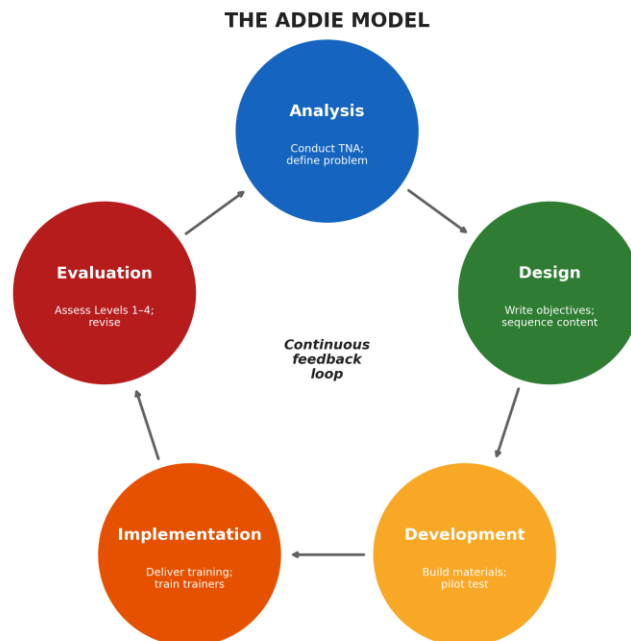
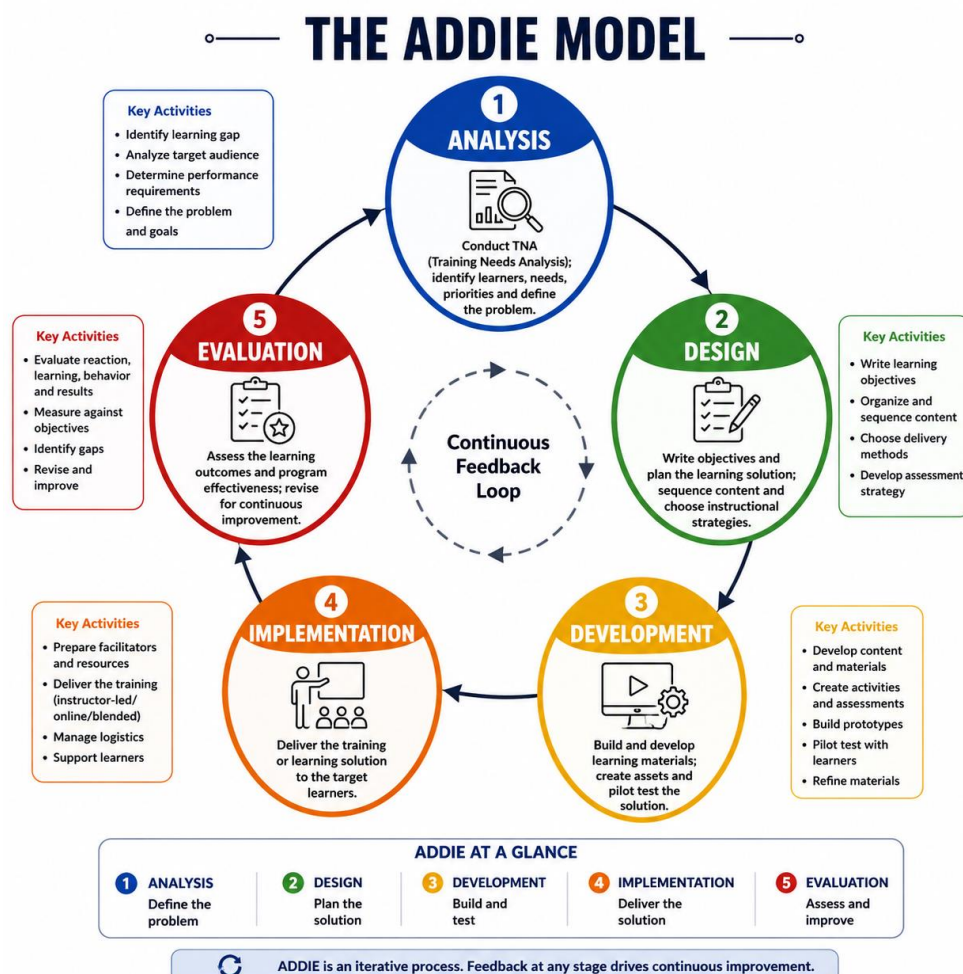


Figure 2.1 — The ADDIE instructional systems design cycle .



Other Instructional Systems Design (ISD) Models

Model	Key Features
SAM (Successive Approximation Model)	Agile/iterative alternative to ADDIE; rapid prototyping with stakeholder feedback loops reduces the risk of a misaligned final product; better for fast-changing content.
Dick & Carey Model	Highly systematic; linear 10-step process with strong emphasis on performance objectives and criterion-referenced assessment.
Kemp's Design Model	Flexible, non-linear; emphasises the instructional problem and learner characteristics from the start.
Rapid Prototyping	Quickly build draft materials, test with small groups, and iterate; reduces development time.

2.3. Learning Styles and Individual Learner Differences

Understanding individual learner differences helps trainers select methods and materials that reach the widest range of participants:

Model	Styles / Types and Training Implications
VARK (Fleming)	Visual (diagrams, charts), Auditory (lecture, discussion), Read/Write (handouts, notes), Kinaesthetic (hands-on, simulation). Use multi-modal instruction to reach all learners.
Kolb's Experiential Learning Cycle	Concrete Experience → Reflective Observation → Abstract Conceptualisation → Active Experimentation. Effective training rotates through all four stages: do → reflect → theorise → apply.
Multiple Intelligences (Gardner)	Linguistic, logical-mathematical, spatial, musical, bodily-kinaesthetic, interpersonal, intrapersonal, naturalist. Design activities that engage diverse intelligence types.
Felder-Silverman Learning Styles	Active/Reflective; Sensing/Intuitive; Visual/Verbal; Sequential/Global. Vary instruction to accommodate both ends of each spectrum.

⚡ EXAM TIP

While learning-styles models are widely used in training practice, their scientific validity (i.e., that matching instruction to a person's preferred 'style' improves outcomes) is debated in the education-research literature. The defensible principle for the exam is that **VARIED** instructional methods improve engagement and retention for most learners, regardless of which learning-styles taxonomy is used.

Categories of Learners (Behavioural Orientation)

Category	Description and Example
Navigators	Goal-driven and systematic; prefer clear objectives and structured approaches. Example: request detailed training schedules and track progress toward standards.
Problem Solvers	Analytical; enjoy applying logic and critical thinking. Example: excel in troubleshooting exercises or root-cause analysis of incidents.
Engagers	Social and collaborative; prefer interaction and active participation. Example: thrive in group discussions, role play, and brainstorming.

2.4. Developing Training Materials

Well-designed materials enhance learning and support the instructional strategy. Key design principles:

- Alignment: every material element must support the stated learning objectives.
- Readability: match reading level to the audience (generally 8th–10th grade for general worker training).
- Clarity: use plain language; avoid jargon unless teaching technical terminology.
- Chunking: break content into manageable units (cognitive load theory — working memory holds roughly 7 ± 2 items); sessions should generally not exceed 45–90 minutes of continuous content without an activity break.
- Multimedia principle (Mayer): words + pictures produce better learning than words alone.
- Redundancy principle: avoid presenting the same information as both narrated audio and on-screen text simultaneously.
- Signalling: use headings, bolding, colour, and white space to guide attention.
- Spaced learning / distributed practice: multiple short sessions over time outperform a single long session for retention.

Types of Training Materials

Material	Purpose and Design Tips
Facilitator/Instructor Guide	Complete roadmap for the trainer: objectives, timing, discussion questions, activities, demonstrations, answer keys. Enables consistent delivery across instructors.
Participant Guide / Workbook	Learner reference during and after training; includes notes space, key content, exercises, action items.

Slide Presentation	Visual anchor for lectures; use the 6×6 rule (6 bullets max, 6 words per bullet); high contrast; relevant visuals; avoid reading slides verbatim.
Job Aids / Reference Cards	Point-of-use quick reference (checklists, decision trees); laminated for field use; supplement but do NOT replace training.
Videos	Demonstrate procedures and show consequences; high engagement; can become outdated if PPE/regulations change; captioning required for accessibility.
E-Learning Modules	Self-paced; scenario-based; branching scenarios for decision-making; include knowledge checks; track completions via an LMS.
Assessment Tools	Pre-tests (baseline), quizzes (formative), post-tests (summative); must align with objectives; criterion-referenced (performance standard), not norm-referenced.

Accessibility and Literacy Considerations

- Low health literacy is common in diverse workforces — use pictures, diagrams, and demonstrations.
- Limited English Proficiency (LEP) workers: provide translated materials, interpreters, bilingual trainers, and picture-based job aids.
- ADA compliance: closed captioning for videos; screen-reader-compatible e-learning; adequate font size for visual impairments.
- Cultural sensitivity: ensure examples, images, and scenarios are culturally appropriate and inclusive.

⚡ EXAM TIP

OSHA consistently requires that training be conducted in a language and vocabulary workers can understand — not merely provided in English with a translated handout. OSHA has cited employers for training in English only when workers did not understand it.

□ KEY REFERENCES

Brauer (Ch. 26): Safety Education and Training. Yates (Ch. 14): Training and Education. ANSI/ASSP Z490.1-2016. Mayer, R.E. Multimedia Learning (Cambridge University Press) — multimedia and redundancy principles.

3. CONTINUOUS IMPROVEMENT AND TRAINING PROGRAMME MANAGEMENT

3.1. PDCA Applied to Training Programmes

The CSP blueprint specifically requires describing how to implement training programmes using the Continuous Improvement model. In safety training, this is most commonly operationalised as the Plan-Do-Check-Act (PDCA) cycle applied across the full training lifecycle, ensuring the programme is never treated as a one-time deliverable but as an ongoing, data-driven system.

PDCA Stage	Training Programme Activities
PLAN	Conduct an annual (or triggered) training needs assessment to identify new gaps; review incident data, regulatory changes, and process changes; update learning objectives based on TNA findings; revise the curriculum map (what topics, in what sequence, by what method); define evaluation metrics (what does 'success' look like); build the training budget and resource plan; schedule the training calendar including all mandatory training dates.
DO	Deliver training per the plan; document attendance; support learner transfer to the job; monitor delivery quality; collect Level 1 (Reaction) data immediately after each session.
CHECK	Review Level 2 assessment scores; collect Level 3 behavioural observation data (typically 30/60/90 days post-training); review Level 4 outcome metrics (injury rates, compliance scores, near-miss reports) before vs. after.
ACT	Identify improvement opportunities from the data; update curriculum, materials, and methods accordingly; celebrate successes and share results with leadership to make the business case for continued training investment.

⚡ EXAM TIP

The PDCA cycle for training closes the loop between Evaluation (the 'E' in ADDIE / Kirkpatrick data) and the next cycle's Analysis (TNA) — evaluation data from one training cycle becomes a primary input to the next cycle's needs assessment. This is the mechanism by which 'continuous improvement' is actually implemented, and is a direct blueprint requirement for Domain 7.

PDCA APPLIED TO TRAINING PROGRAMMES



Figure 3.1 — The PDCA (Plan-Do-Check-Act) continuous improvement cycle applied to training programmes .

PDCA APPLIED TO TRAINING PROGRAMMES



Ten Requirements for an Effective Training Programme

A classic checklist (widely attributed to Gordon Lippitt) for building an effective training programme end-to-end:

1. Determining needs
2. Setting objectives
3. Determining subject content
4. Selecting participants
5. Determining the best schedule
6. Selecting appropriate facilities
7. Selecting appropriate instructors
8. Selecting and preparing audiovisual aids
9. Coordinating the programme
10. Evaluating the programme

Three Purposes of Evaluation

Programme evaluation ultimately serves three organisational purposes:

1. Should we continue the programme?
2. How can the programme be improved?
3. Justify the programme's existence (demonstrate value to stakeholders and leadership).

3.2. ANSI Z490.1 and Regulatory Training Requirements

ANSI/ASSP Z490.1 is the voluntary consensus standard for workplace safety and health training. It provides criteria across the full training lifecycle and is closely aligned with the ADDIE model.

- Establishes criteria for TNA, objectives, design, delivery, evaluation, and programme management.
- Requires training to be conducted in a language and vocabulary the worker can understand.
- Specifies that hazard-specific training must address the specific hazards present in the worker's environment.
- Trainer qualification: trainers must be knowledgeable in the subject matter AND competent in instructional methodology.
- Recordkeeping: maintain records of training delivered, content, trainer qualifications, and employee participation.

⚡ EXAM TIP

ANSI Z490.1 is the primary standard the CSP exam uses to benchmark acceptable SH&E training practices. It is voluntary and not independently enforceable, but is frequently cited by OSHA as a resource for demonstrating a defensible training programme.

Key OSHA Training Requirements

OSHA Standard	Training Requirement	Who Must Be Trained	Frequency
29 CFR 1910.1200 — HazCom	SDS access, label reading, chemical hazards in the workplace	All workers exposed to hazardous chemicals	At hire; when new chemicals/hazards introduced
29 CFR 1910.147 — Lockout/Tagout	Energy control procedures	Authorised and affected employees	At hire; when procedures change; when inadequacy observed (retraining)
29 CFR 1910.134 — Respiratory Protection	Proper use, donning/doffing, maintenance, limitations, medical clearance	Workers required to use respirators	Before first use; annually; when changes occur
29 CFR 1910.146 — Permit-Required Confined Space	Entrant, attendant, entry supervisor, rescue team roles	Authorised entrants, attendants, entry supervisors	Before initial assignment; when there is reason to believe knowledge/skill is deficient (no fixed interval)
29 CFR 1910.1030 — Bloodborne Pathogens	Transmission, prevention, PPE, HBV vaccination, post-exposure	Workers with occupational exposure to BBP	At hire and annually thereafter
29 CFR 1910.132 — PPE	When PPE is required, selection, use, maintenance, limitations	Workers assigned PPE	When assigned; when deficiencies observed
29 CFR 1910.95 — Hearing Conservation	Noise hazards, audiometric testing, HPD use	Workers with TWA ≥85 dBA	At hire; annually thereafter
29 CFR 1910.38 — Emergency Action Plan	Alarm systems, evacuation routes, assembly points, employee roles	All covered employees	When EAP established/revised; when role changes
29 CFR 1926.503 — Fall Protection (Construction)	Fall hazard recognition and protection procedures	All construction workers exposed to fall hazards	Initial; refresher when deficiencies observed
29 CFR 1910.119 — Process Safety Management	Process hazards, operating procedures, emergency response	Employees on covered processes	Before initial assignment; refresher at least every 3 years

⚡ EXAM TIP

Retention periods vary by standard and must be distinguished on the exam: LOTO annual inspection documentation; BBP training records — 3 years from date of training; medical records (BBP vaccination/exposure follow-up, lead) — duration of employment PLUS 30 years; confined space entry permits — 1 year retention (training records themselves generally follow the same 'reason to believe' retraining trigger as LOTO, with no fixed periodic interval).

3.3. Training Programme Administration

Function	Key Considerations
Scheduling	Regulatory deadlines; shift coverage; seasonal hazard variations (e.g., heat stress training before summer); new-hire orientation within the first day.
Recordkeeping	Training records: date, content, trainer name/qualifications, employee name and signature; retention per the applicable OSHA standard.
Learning Management System (LMS)	Tracks completion, scores, and expiration dates; sends automated reminders for refresher training; generates compliance reports.
Refresher Training	Required by many OSHA standards; frequency varies (annual for BBP, respirator, HazCom; every 3 years for PSM; 'when deficiencies are observed' for LOTO/confined space).
Trainer Qualification	Subject-matter expertise PLUS instructional competence; documentation of trainer credentials required.
Budget Management	Training costs include materials, facilitator time, venue, lost production, and travel; cost-benefit analysis justifies the programme.
Contractor Training	OSH Act responsibility extends to multi-employer worksites; the host employer must ensure contractors have received site-specific training.

⚡ EXAM TIP

The employer bears primary legal responsibility for ensuring required training is provided by qualified personnel, even when a contract trainer is used. Outsourcing training delivery does NOT transfer OSHA compliance responsibility — employers must verify contract trainer credentials (e.g., under HAZWOPER, 29 CFR 1910.120(e)(5), trainers must have completed a course equivalent to or greater than the course they teach, plus field experience).

□ KEY REFERENCES

ANSI/ASSP Z490.1-2016: Criteria for Accepted Practices in Safety, Health, and Environmental Training. OSHA 29 CFR 1910 — numerous subpart standards with training requirements. Lippitt, G. Ten Requirements for an Effective Training Programme.

4. TRAINING EFFECTIVENESS EVALUATION

4.1. Kirkpatrick's Four-Level Model and Phillips' ROI

The Kirkpatrick Model (1959, refined by Kirkpatrick & Kirkpatrick, 2016) is the most widely referenced framework for evaluating training effectiveness, and the CSP exam tests it extensively.

THE KIRKPATRICK MODEL

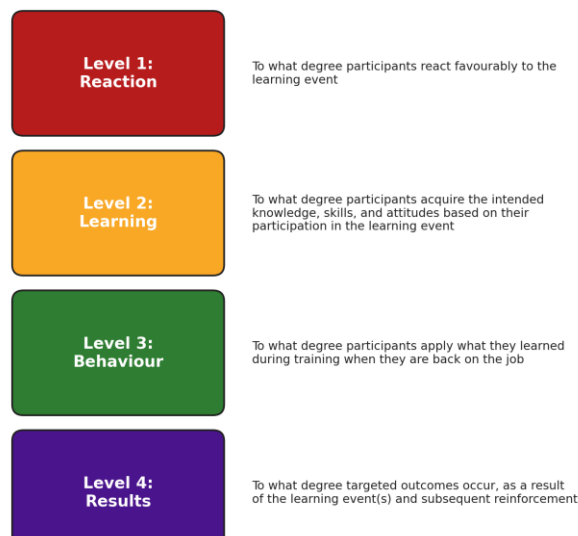
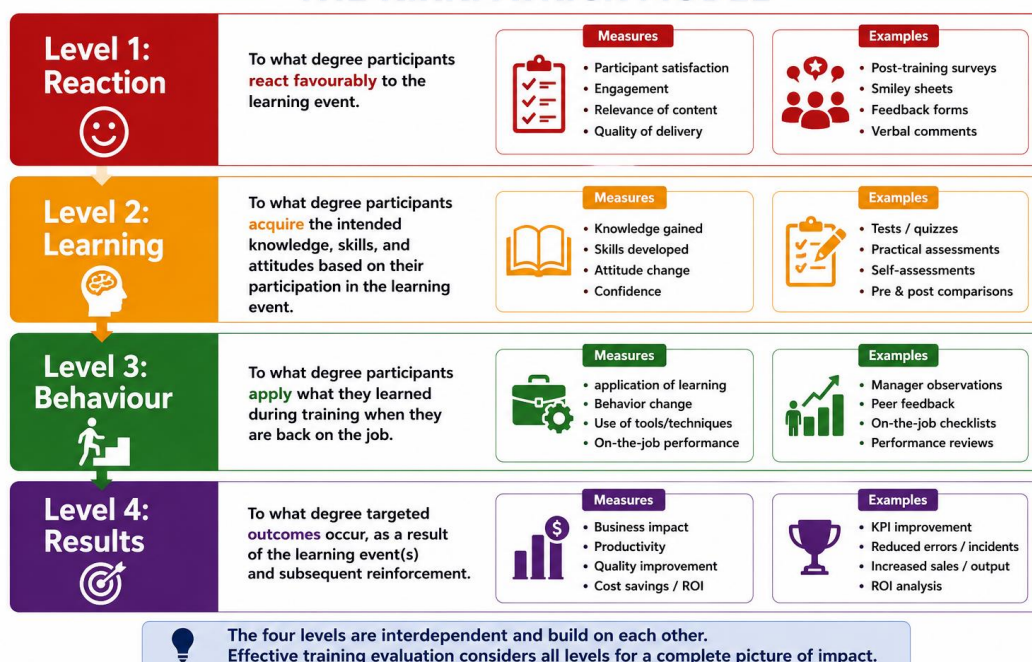


Figure 4.1 — Kirkpatrick's four levels of training evaluation .

THE KIRKPATRICK MODEL



Kirkpatrick's Five Levels — Question, Methods, Timing, and Value

Level	Question	Methods	Timing	Value
Level 1 — Reaction	Did they like it? Was it relevant?	Post-training survey (smile sheet); rating scales for content, delivery, materials	Immediately after training	Identifies delivery problems; participation satisfaction
Level 2 — Learning	Did they learn? Did KSAs improve?	Pre/post knowledge tests; skills demonstrations; return demonstrations (show me); written exams; simulated performance	Before and after training	Confirms knowledge transfer; verifies training worked
Level 3 — Behavior	Did they apply it? Changed behavior?	Job observations (30–60–90 days post); supervisor rating scales; BBS observation data; incident analysis	30, 60, 90 days post-training	Most important for safety — did behavior actually change?
Level 4 — Results	Did it impact business outcomes?	Compare injury rates, TRIR, DART, workers' comp costs, near-miss reports, compliance scores, regulatory findings before vs. after	3–6 months post-training	Demonstrates ROI and business value to leadership
Level 5 — (Phillips)	Was the investment worthwhile?	Isolate training impact; convert benefits to monetary value; calculate ROI%	6–12 months post-training	Justifies training budget; enables comparison of safety interventions

Explanation with Examples

- **Reaction:** measures learner satisfaction with the training programme, typically assessed through surveys or feedback forms gauging participants' opinions on content, trainer, and overall experience. Example: 'How satisfied were you with the clarity of instructions?'
- **Learning:** assesses the knowledge, skills, or attitudes acquired during training; pre- and post-training tests or quizzes measure the improvement. Example: testing learners' understanding of hazardous material handling after the session.
- **Behavior:** evaluates the application of learned skills on the job; observations or performance reviews determine if training translates into behavioural changes. Example: monitoring whether workers consistently use PPE after safety training.
- **Results:** measures the overall impact of the training on organisational goals, such as reduced accidents, increased productivity, or compliance improvements. Example: a 30% decrease in workplace injuries post-training.

Other Evaluation Methods

- **Pre- and post-testing:** using quizzes or tests before and after training to determine knowledge improvements.

- On-the-job observations: supervisors or safety officers observe workers applying the training in real work environments, noting changes in safety practices.
- Incident data comparison: evaluate whether incident rates, near misses, or safety violations have decreased following the training.
- Feedback surveys: gather feedback from both trainees and their supervisors to identify strengths and weaknesses in the training programme.

□ KEY FORMULA

Phillips' Fifth Level — Return on Investment (ROI): $\text{ROI} (\%) = [(\text{Benefits} - \text{Costs}) / \text{Costs}] \times 100$. Requires converting Level 4 results to monetary value and isolating training's contribution from other organisational changes. Example: training reduced recordable incidents from 12 to 6/year; each incident costs \$40,000 avg. Benefit = $6 \times \$40,000 = \$240,000$; Training cost = \$30,000; $\text{ROI} = [(\$240,000 - \$30,000) / \$30,000] \times 100 = 700\%$.

□ KEY FORMULA

Worked example (forklift training): Programme cost = \$15,000; prevented 2 injuries at an average cost of \$40,000 each = \$80,000 benefit. $\text{ROI} = [(80,000 - 15,000) / 15,000] \times 100 \approx 433\%$. Isolation techniques used to attribute the benefit specifically to training — rather than to other concurrent changes — include control groups, trend-line analysis, participant estimation, and management estimation.

⚡ EXAM TIP

Kirkpatrick Level 1 (Reaction) is the EASIEST to measure but LEAST predictive of actual behaviour change. Level 3 (Behaviour/Transfer) is the most difficult and most neglected level in practice, yet it is the level most important for safety outcomes. Average recordable-injury cost benchmarks (e.g., ~\$36,000+ per NSC data, \$1M+ for a fatality including all costs) are commonly used to translate Level 4 results into the monetary values needed for ROI calculations. Safety training, when rigorously evaluated, often yields ROI in the range of roughly 300–600%.

4.2. Other Evaluation Models

Model	Key Features
CIPP Model (Stufflebeam)	Context, Input, Process, Product. Evaluates the programme from design through delivery and outcomes, providing FORMATIVE (ongoing) information for improvement decisions — not just summative results after the fact.
Brinkerhoff's Success Case Method	Identifies and analyses best-case and worst-case training outcomes; documents what works and what doesn't; efficient for large programmes.
Kaufman's Five Levels	Extends Kirkpatrick to include societal outcomes; adds levels of input/enablers and processes; useful for demonstrating broader programme value beyond the organisation.

⚡ EXAM TIP

CIPP differs from Kirkpatrick in that it is designed to inform decision-making **THROUGHOUT** the programme lifecycle (Context = what is needed; Input = what is the best design; Process = how is delivery going; Product = what results were achieved), whereas Kirkpatrick is primarily a summative outcome model, though it can be applied formatively as well.

4.3. Assessment Design

Training assessments must be **VALID** (measure what they are intended to measure) and **RELIABLE** (produce consistent results).

Assessment Type	Purpose and Notes
Criterion-Referenced Assessment	Measures performance against a pre-set standard (the objective); pass/fail or proficiency score; preferred in safety training where everyone must meet a minimum standard.
Norm-Referenced Assessment	Ranks learners against each other; less appropriate for safety compliance training.
Formative Assessment	Ongoing checks during training (quizzes, polls, demonstrations); allows the trainer to adjust instruction; low/no stakes.
Summative Assessment	End-of-training evaluation; determines whether objectives were met; basis for certification or record of completion.
Pre-Test	Assesses baseline knowledge before training; identifies what learners already know; allows customisation of content.
Skills Verification	Observation of physical performance with a behavioural checklist; essential for psychomotor objectives (e.g., lockout, respirator donning).

Validity Types



- Content validity: test items match the training objectives (content coverage).
- Criterion validity: post-test scores correlate with an independent, external performance criterion (e.g., actual job performance rated by a qualified evaluator).
- Reliability (internal consistency): items measure the same construct consistently (e.g., Cronbach's alpha) — reliability does not by itself establish validity.

4.4. Training Effectiveness Metrics and Transfer of Training

Metric	Description
Training completion rate (%)	Percentage of required personnel who completed required training on schedule.
Pre/post test score improvement	Average gain in knowledge test scores; indicates learning at Level 2.
Behaviour observation score (% safe)	Percentage of observed behaviours rated as safe; a Level 3 indicator.
Recordable incident rate (TRIR)	Long-term Level 4 outcome indicator.
Near-miss reporting rate	An INCREASE in near-miss reporting may indicate improved safety culture (more willingness to report), not necessarily more incidents.
OSHA citation rate	Reduction in regulatory citations following training.
Cost per trained employee	Training programme cost-efficiency metric.

Transfer of Training

Transfer of training is the degree to which learned behaviours are applied on the job.

Transfer Type	Definition
Positive Transfer	Training facilitates job performance; occurs when training conditions match job conditions (realistic scenarios, actual equipment).
Negative Transfer	Training interferes with job performance; occurs when training procedures conflict with actual job procedures.
Zero Transfer	Training has no effect on job performance; typically due to irrelevant content, poor design, or no opportunity to apply skills.

Factors that promote positive transfer (Baldwin & Ford model): trainee characteristics (self-efficacy, motivation, cognitive ability, prior relevant experience); training design (identical elements, overlearning, practice with feedback, varied conditions); and work environment (supervisor support, peer support, opportunity to perform, removal of barriers, post-training coaching).

⚡ EXAM TIP

Transfer of training is often called the 'Achilles heel' of safety training programmes — most design effort goes into content and delivery, not transfer. Supervisor support is consistently identified as the SINGLE MOST IMPORTANT work-environment factor for transfer of training. Overlearning (practising beyond initial mastery) increases retention and automaticity, especially for psychomotor skills, enabling correct performance under stress or time pressure.

□ KEY REFERENCES

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5. EDUCATION AND TRAINING METHODS, TECHNIQUES, AND DELIVERY

5.1. Instructional Methods Overview

Selecting the right instructional method depends on the objective type (cognitive, psychomotor, or affective), audience size, budget, available technology, geographic distribution of learners, and the required level of interactivity and realism.

Method	Best For / Advantages and Limitations
Lecture	Efficiently delivers information to large groups; low cost; limited interaction; retention low without reinforcement activities. Best for cognitive remember/understand level.
Discussion / Facilitated Dialogue	Engages prior experience; promotes higher-order thinking; builds affective outcomes; requires a skilled facilitator. Best for analyse/evaluate levels.
Case Study	Develops critical thinking and problem-solving; connects theory to practice; high engagement. Best for apply and analyse levels.
Role Play	Develops interpersonal and communication skills; safe environment to practise; can feel artificial. Best for affective and psychomotor domains.
Demonstration / Return Demonstration	Shows the correct procedure; the learner mimics it; confirms competence; requires physical setup. Essential for psychomotor objectives (donning PPE, operating equipment).
Simulation / Table-top Exercise	High fidelity; safe practice of emergency response; expensive to develop; excellent transfer. Best for complex psychomotor and decision-making skills.
On-the-Job Training (OJT)	Real work setting; high transfer; requires trained coaches; risk of reinforcing bad habits if unstructured. Structured OJT requires task breakdown, observation, and feedback.
E-Learning / Computer-Based Training (CBT)	Consistent delivery; 24/7 access; scalable; tracks completion; low marginal cost; limited for hands-on skills; requires device/internet. Best for knowledge and awareness.
Virtual Reality (VR)	Immersive simulation of hazardous environments; high engagement; effective for psychomotor and spatial skills; high development cost.
Job Aid	Performance support at the point of need (checklist, flow chart, laminated quick reference); NOT a substitute for training, but reduces the need for memorisation.
Blended Learning	Combines e-learning for knowledge with face-to-face for skills/discussion; optimises cost and effectiveness — the preferred approach for most safety topics.

⚡ EXAM TIP

Psychomotor objectives REQUIRE hands-on practice (demonstration, simulation, OJT) — e-learning alone is insufficient to develop a physical skill. Job aids supplement but do not replace training where knowledge retention is required. Blended learning is the format preferred in ANSI Z490.1 guidance — combine media to maximise effectiveness.

5.2. Training Delivery Method Selection Guide

Choosing among modern delivery technologies requires weighing advantages, limitations, and the specific safety application:

Method	Best For	Key Advantages	Key Limitations	Example Safety Application
Instructor-Led Training (ILT)	Complex topics; certification; attitude change	Immediate Q&A; adaptable; relationship-building	Expensive; scheduling; delivery consistency varies	Confined space entry, emergency response, leadership skills
E-Learning / LMS	Compliance training; awareness; large populations	Scalable; consistent; trackable; self-paced	Limited interaction; passive learning	HazCom, LOTO initial awareness, regulatory basics
Blended Learning	Complex skills + knowledge	Optimises both knowledge transfer and skill practice	Requires careful instructional design and coordination	Fall protection: online knowledge + hands-on harness fitting
Simulation / Tabletop	Decision-making; emergency response; high stakes	Safe practice; realistic; reveals gaps without real consequences	High cost for technical simulations; time-intensive	Emergency response drills, confined space rescue
Virtual Reality (VR)	Hazard recognition; high-risk environments	Immersive; memorable; eliminates real danger during learning	Hardware cost; 'cybersickness'; content development cost	Height safety, confined space entry, electrical safety
Artificial Intelligence (AI)	Personalised learning paths; adaptive testing	Adapts to learner; identifies weak areas; scales	Data privacy; quality of AI content; requires validation	Adaptive compliance training, gap identification
On-the-Job Training (OJT)	Specific job skills; new-hire orientation	Highly relevant; immediate application; no travel	Quality depends on trainer; may teach bad habits if unstructured	Equipment operation, SOP compliance
Coaching / Mentoring	Behavioural change; leadership development	Individualised; sustained; builds relationship and trust	Time-intensive; requires trained coaches; hard to scale	Safety leadership development, supervisor coaching

Synchronous vs. Asynchronous Delivery

Synchronous training: instructor and learners interact in real time (classroom, live webinar, virtual classroom). Asynchronous training: learners complete content independently at their own pace (e-learning, recorded video). Blended programmes often combine both, using asynchronous modules for knowledge and synchronous sessions for skills practice and discussion.

5.3. Effective Presentation Techniques and Group Dynamics

Aspects of an Effective Presentation

Five elements to plan before delivering any training session: the Objective, the Speaker, the Room, the Audience, and the Message.

Presentation Techniques

- Use visual aids to support (not replace) the spoken message.
- Keep it short and sweet — respect the audience's attention span.
- Use the rule of three (group key points into threes for memorability).
- Rehearse before delivering, and video yourself to self-critique delivery.
- Tell stories — narrative increases engagement and retention.
- Lose the bullet points — don't put your speaker notes up on the screen.
- Know what slide is coming next; have a back-up plan for technology failure.
- Check out the presentation room in advance (seating, AV, sightlines).

Group Dynamics and Classroom Management

- Establish ground rules at the outset (respect, confidentiality, participation).
- Use icebreakers and introductions to reduce anxiety and build rapport.
- Manage dominant learners by redirecting to the group or using small-group activities.
- Engage quiet learners through pair activities, anonymous polling, or small groups.
- Address resistant learners by acknowledging concerns and linking training to personal safety benefits.
- Use questions strategically: open questions to stimulate discussion; closed questions to check specific knowledge.

□ KEY REFERENCES

Brauer (Ch. 26): Safety Education and Training. ANSI/ASSP Z490.1-2016. Knowles, M.S., Holton, E.F., Swanson, R.A. The Adult Learner.

6. ADULT LEARNING PRINCIPLES

6.1. Foundational Learning Theories

Learning is a relatively permanent change in knowledge, skill, or attitude resulting from experience or instruction. Safety training professionals must understand the theoretical foundations of learning to design effective programmes.

Theory / School	Key Principles and Workplace Application
Behaviourism (Pavlov, Skinner, Thorndike)	Learning through stimulus-response and reinforcement. Positive reinforcement strengthens safe behaviours; extinction of unsafe behaviours occurs through removal of rewards. Foundation of behaviour-based safety (BBS) and token economies.
Cognitivism (Bruner, Ausubel, Piaget)	Learning involves mental processing, problem-solving, and schema formation. Prior knowledge structures (schemata) must be engaged; training should activate prior knowledge, organise new information logically, and promote meaningful learning.
Constructivism (Vygotsky, Dewey)	Learners actively construct knowledge from experience. Social learning and collaboration are essential. Zone of Proximal Development (ZPD): learners grow when challenged just beyond current ability with support. Experiential and problem-based learning formats align with this theory.
Social Learning Theory (Bandura)	Behaviour is learned through observation, imitation, and modelling. Self-efficacy (belief in one's own ability to perform a behaviour) is a critical predictor of behaviour change. Key elements: attention, retention, reproduction, motivation.
Humanism (Maslow, Rogers)	Learner-centred; focuses on personal growth and intrinsic motivation. Maslow's hierarchy of needs suggests physiological and safety needs must be met before higher-order learning can occur.
Connectivism (Siemens — digital age)	Learning occurs through networks; relevant in e-learning and technology-mediated training environments.

⚡ EXAM TIP

Self-efficacy (Bandura) is the single strongest predictor of whether a worker will perform a safe behaviour — a frequently tested exam point. Behaviourism underpins BBS; Constructivism/ZPD underpins simulation and experiential formats; Humanism explains why unmet basic needs (fatigue, discomfort) undermine training effectiveness.

6.2. Andragogy — Knowles' Adult Learning Principles

Andragogy (adult learning) contrasts with pedagogy (child learning: teacher-directed, student accepts content, subject-centred). Malcolm Knowles identified six core assumptions about adult learners that must inform safety training design:

Assumption	Implication for Safety Training Design
Self-concept: Adults are self-directing	Provide choice in learning paths; avoid top-down lecturing; encourage autonomy in practice exercises.
Experience: Adults bring rich experience	Build on prior knowledge; use case studies and real-world examples from participants' own experience.
Readiness to learn: Problem-centred	Adults learn when they see immediate relevance. Frame training around real workplace hazards and job-specific scenarios.
Orientation: Task/problem-centred	Present content in the context of real tasks, not abstract concepts. 'How does this help me do my job safely?' must be answered.
Motivation: Primarily intrinsic	Appeal to internal motivators (pride, professionalism, protecting colleagues) rather than compliance alone.
Need to know: Must see the 'why'	Explain the purpose and consequences before teaching the 'how'; justify each training element.

⚡ EXAM TIP

Andragogy vs. Pedagogy is a classic CSP exam distinction: adults are self-directed, experience-driven, and problem-centred. Knowles' six assumptions underpin ANSI Z490.1, the standard for SH&E training programme design.

6.3. VARK, Learning Retention Models, and Kolb's Cycle

VARK (Fleming) categorises learner preference into four modes: Visual (diagrams, charts, process maps, colour coding, graphs, infographics), Auditory (lectures, verbal explanations, group discussion, podcasts), Read/Write (handouts, text-based manuals, written instructions, note-taking), and Kinaesthetic (hands-on practice, simulations, role play, demonstrations, real equipment, OJT). Most learners have a preferred mode but benefit from multi-modal delivery, so training should be designed for multiple styles rather than a single one.

Learning Retention Models (Approximate, Widely Cited)

Several similar 'retention pyramid' models circulate in training literature, most tracing to Edgar Dale's Cone of Experience. The exact percentages below are commonly cited in workplace training materials, but their precise empirical basis is often criticised by learning-science researchers as overstated or unverified —

the DIRECTION of the relationship (more active/participatory methods improve retention over passive methods) is well supported, even where the specific percentages are not:

Method (Least → Most Active)	Approximate Retention Rate
Lecture (passive listening)	~5–10%
Reading	~10%
Audiovisual (video, slides)	~20%
Demonstration (watching a live demo)	~30%
Discussion group	~50%
Practice by doing (hands-on, simulation)	~75%
Teaching others / immediate application	~90%

LEARNING RETENTION BY INSTRUCTIONAL METHOD

(approximate, widely cited figures — direction is well supported; exact percentages are debated)

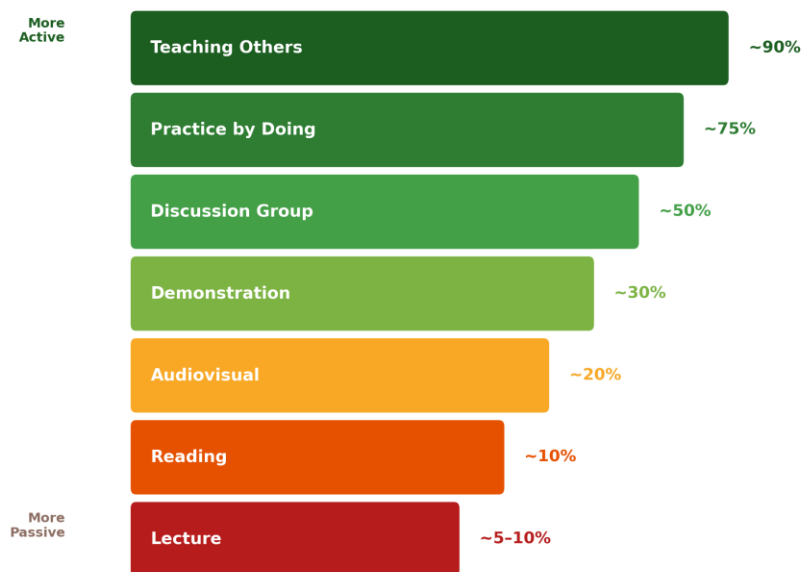


Figure 6.1 — The learning retention pyramid: retention generally increases as instructional methods become more active and participatory (approximate, widely cited figures);

EXAM TIP

Implication for training design: move beyond passive lecture. Practice, demonstration, role play, and simulation dramatically increase retention compared to reading or listening alone. When asked to select the BEST method to maximise retention for a given objective, favour the MOST ACTIVE method that is feasible for the resource and safety constraints of the scenario.

The 70:20:10 Learning Model

A complementary framework for HOLISTIC learning system design (not a single-session retention model) holds that approximately 70% of workplace learning occurs experientially (on-the-job), 20% socially (coaching, mentoring, peer learning), and 10% through formal training. This model argues that formal classroom/e-learning content should be reinforced with structured OJT and supervisor/peer coaching to be effective — formal training alone addresses only a small fraction of how adults actually develop workplace competence.

Kolb's Experiential Learning Cycle

Kolb's cycle proposes that effective learning progresses through four stages in sequence: (1) Concrete Experience — doing/having an experience; (2) Reflective Observation — reviewing/reflecting on the experience; (3) Abstract Conceptualisation — concluding/theorising from the experience; (4) Active Experimentation — planning/trying out what was learned. Effective training rotates through all four stages rather than stopping at the 'doing' stage.

6.4. Motivation and Cultural Considerations in Adult Learning

Wlodkowski's model identifies four conditions necessary to motivate culturally diverse adult learners:

Condition	Description and Example
Establishing Inclusion	Creating an environment where all learners feel respected, safe, and valued, considering cultural norms and encouraging active participation. Example: addressing learners by name and encouraging them to share perspectives.
Developing Attitude	Building trust and a positive outlook toward learning by demonstrating relevance to personal and professional goals. Example: explaining how safety training prevents injuries and enhances career opportunities.
Enhancing Meaning	Making learning personally and culturally relevant by linking it to real-world examples. Example: using scenarios that reflect the diverse cultural backgrounds of learners during role-play exercises.
Engendering Competence	Building learners' confidence by providing feedback, reinforcing progress, and offering opportunities for skill mastery. Example: providing practice opportunities with supportive coaching to master new machinery.

Additional Learning Concepts

- Instruction Types: Training (specific, job-oriented skills or tasks); Instruction (step-by-step guidance on a single process/procedure); Education (broader, theoretical, foundational knowledge built over time).
- Knowledge Types: Declarative knowledge ('knowing what' — facts, rules, definitions); Procedural knowledge ('knowing how' — operating machinery, conducting risk assessments); Experiential knowledge (gained through hands-on trial and error, e.g., troubleshooting equipment failures).
- Thorndike's Laws of Learning: Readiness (learners absorb information more effectively when mentally/physically prepared); Exercise (repetition and practice strengthen learning); Effect (positive reinforcement motivates learners; negative experiences hinder learning).
- Training Delivery Concepts: Signals (visual/auditory cues that guide learner attention, e.g., bold headings, verbal prompts); Trainer-controlled actions (demonstrations, interactive questioning, storytelling); Attending skills (active listening and observing learners' non-verbal cues to adjust delivery).

□ KEY REFERENCES

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Kolb, D.A. Experiential Learning. Dale, E. Audio-Visual Methods in Teaching (Cone of Experience, original, non-numerical). Wlodkowski, R.J. Enhancing Adult Motivation to Learn.

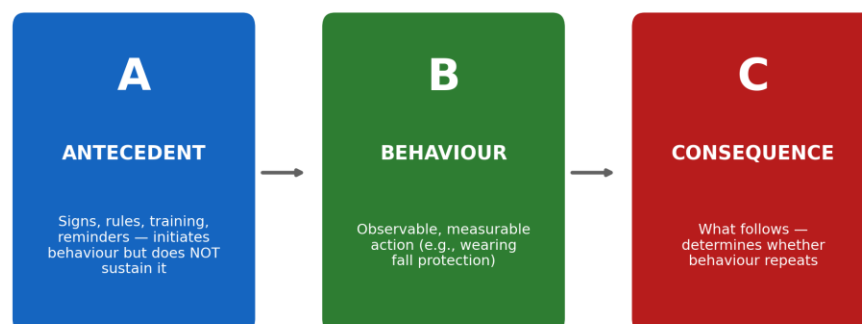
7. BEHAVIOUR-BASED SAFETY (BBS)

7.1. Theoretical Foundation — The ABC Model

Behaviour-Based Safety (BBS) applies applied behaviour analysis (ABA) — rooted in Skinner's operant conditioning — to reduce at-risk workplace behaviours. Although not a standalone blueprint objective, BBS is heavily featured in Domain 7 source material and exam content because it is the practical application of the learning and behavioural theories covered elsewhere in this domain. The foundational model is ABC Analysis:

ABC Component	Definition and Example
A — Antecedent	A stimulus that precedes and sets the stage for a behaviour. Example: a safety poster warning of a slip hazard. Antecedents INITIATE but do NOT SUSTAIN behaviour over time.
B — Behaviour	An observable, measurable action. Example: a worker wears a fall protection lanyard while on an elevated platform.
C — Consequence	What follows the behaviour; determines whether the behaviour is repeated. Positive reinforcement increases the behaviour; negative consequences can suppress behaviour but carry side effects (resentment, gaming the system).

THE ABC MODEL OF BEHAVIOUR-BASED SAFETY



Consequences that are **SOON, CERTAIN, and POSITIVE** most strongly reinforce behaviour — whether safe or at-risk

Figure 7.1 — The ABC model of behaviour-based safety.

⚡ EXAM TIP

Antecedents (signs, reminders, rules, training) initiate or cue behaviours in the short term but have limited power to SUSTAIN behaviour. Consequences — what happens after the behaviour — determine whether it is repeated. This explains why training alone (an antecedent) does not sustain behaviour without a positive-consequence system reinforcing it afterward.

7.2. Consequence Analysis

Consequences are evaluated along three dimensions that determine their power to change behaviour:

Dimension	Strong Consequences	Weaker Consequences
Timing	Soon (immediate after behaviour)	Future (delayed)
Certainty	Certain (always follows behaviour)	Uncertain (sometimes follows)
Significance	Positive (desired by the person)	Negative (aversive)

At-risk behaviour is often reinforced by immediate, certain, positive consequences: 'It's faster to skip the lockout procedure' is soon (saves time now), certain (always saves time), and positive (easier) — while 'nothing bad has happened before' frames injury as future, uncertain, and negative. Conversely, safe behaviour is often punished by immediate, certain, negative consequences: wearing PPE is hot, uncomfortable, and inconvenient — soon, certain, negative.

⚡ EXAM TIP

BBS programmes work by rebalancing consequences to make safe behaviour the path of least resistance — for example, by removing the time penalty of a cumbersome safety procedure (an engineering/system fix) rather than relying solely on training or discipline. The most powerful consequence for SUSTAINING safe behaviour is positive reinforcement (praise, recognition), not punishment.

7.3. BBS Process Elements

A structured BBS programme follows these process elements:

1. Define target behaviours: create a 'critical behaviours inventory' (CBI) of observable, measurable safe behaviours, derived from incident analysis and job observation.
2. Train observers: peers, supervisors, or dedicated safety coaches trained in neutral, non-punitive observation techniques.
3. Conduct observations: structured, objective, frequent; use a behavioural checklist; observe the BEHAVIOUR, not the person.

4. Provide immediate, positive feedback: acknowledge safe behaviour; discuss at-risk behaviour collaboratively; problem-solve barriers together.
5. Graph and display data: post behaviour-percentage charts visibly so teams can see trend progress.
6. Set goals and celebrate improvement: goal-setting and public posting increase motivation.
7. Identify and remove barriers: at-risk behaviour often signals a system problem (poor equipment, unrealistic schedule) requiring an engineering or administrative fix, not more training.

Critical Success Factors

BBS Element	Critical Success Factor
Management commitment	Leadership visibly participates; BBS is part of the management system, not a stand-alone programme.
Employee involvement	Workers help define target behaviours and lead observations; ownership increases acceptance.
Non-punitive culture	Observations must be seen as coaching, not discipline; confidentiality of individual data is protected. This is the most critical and fragile element — if workers believe data is used for discipline, they will not participate honestly and will distrust the programme.
Data-driven feedback	Percent-safe scores are tracked and fed back to teams regularly.
System integration	Linked to incident investigation, JHA, and the broader safety management system.

⚡ EXAM TIP

BBS focuses on OBSERVABLE BEHAVIOURS, not attitudes or conditions — this distinguishes it from broader safety-culture approaches. BBS does NOT replace engineering controls; it is a complementary intervention layered on top of, not a substitute for, the hierarchy of controls. A plateau in percent-safe scores despite active observation often indicates a systemic barrier (equipment, workload, procedure design) that must be identified and removed — more observations or discipline will not fix a system problem.

□ KEY REFERENCES

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Skills and Scenarios

Applying the knowledge areas covered in this domain to real training-design and delivery tasks can be demonstrated through six practical skill areas, each mapped directly to one of the six Domain 7 blueprint objectives.

Skill 1: Perform a Training Needs Assessment

Scenario: A manufacturing plant has experienced an increase in workplace accidents involving lockout/tagout (LOTO) procedures.

- Conduct an incident analysis to determine whether the root cause is a knowledge/skill deficiency or a motivational/system issue.
- Apply the three-level TNA: Organisational (review injury trend and LOTO audit results), Task (decompose the LOTO task into required KSAs), Person (identify which maintenance staff show the gap).
- Having confirmed a genuine knowledge/skill gap, design a blended solution: an online module covering LOTO regulations, followed by hands-on practice in a controlled environment.
- Require a competency evaluation during on-the-job assessment for all maintenance staff before they perform LOTO independently.
- Plan the Level 3 evaluation in advance: track post-training LOTO-related incident/near-miss rates and conduct supervisor observations to confirm procedures are applied correctly.

Skill 2: Develop Training Programmes and Materials

Scenario: A construction company needs a safety training programme for workers on the correct use of fall protection equipment, and a chemical plant separately needs materials for hazardous materials handling.

- Write ABCD-format learning objectives first (e.g., 'the worker will correctly inspect and don a full-body harness with 100% of steps completed in sequence'), before selecting any delivery format — per the ADDIE Design phase.
- Design a classroom-based programme using engaging visuals (videos showing consequences of improper harness use) and a clear, structured sequence, opening each session with a real-world scenario.
- Incorporate a VR or simulation module for harness-inspection practice, addressing the psychomotor objective that e-learning alone cannot satisfy.

- For the hazmat programme, build a comprehensive instructional manual (step-by-step procedures, infographics, case studies of real incidents) plus short videos simulating chemical spills and interactive knowledge-check quizzes.
- Tailor content to the audience's prior knowledge (established via a baseline skills assessment) and to literacy/language needs, and commit to updating materials on a regular cycle as regulations or technology change.

Skill 3: Implement Training Using the Continuous Improvement Model

Scenario: A safety manager is asked to make an existing HazCom/GHS training programme more effective after noticing that Level 3 (behaviour) data shows workers still misreading SDS/label information six months after training, despite good Level 1 and Level 2 scores.

- PLAN: review the current curriculum against updated GHS pictogram guidance and recent near-miss data; revise learning objectives and the evaluation plan for the next training cycle.
- DO: deliver the revised training, this time incorporating more hands-on label/SDS-reading practice rather than lecture alone, and document attendance and immediate Level 1 reactions.
- CHECK: at 30/60/90 days, collect Level 3 behavioural data (spot-check label reading accuracy on the floor) and compare to the pre-revision baseline; review any change in near-miss/incident trends (Level 4).
- ACT: if the behavioural data has improved, standardise the revised curriculum and share the before/after results with leadership to justify continued investment; if not, cycle back to PLAN with a new hypothesis about the root cause.
- Document the whole cycle so it becomes the input to the following year's Organisational Analysis — closing the loop between Evaluation and the next TNA, per the PDCA/continuous improvement model.

Skill 4: Determine Training Programme Effectiveness

Scenario: A health and safety officer must assess the competency of workers after a confined space entry training session, and a fire safety trainer separately needs to build assessment instruments for a fire response course.

- Design a two-part assessment for confined space entry: a written test of theoretical knowledge (Level 2) and a practical exam involving a simulated confined space entry with equipment inspection and rescue procedures.
- Schedule post-training supervisor observations of actual confined space entries (Level 3) to confirm procedures and equipment are used correctly under real conditions, on an ongoing basis.
- For the fire response course, build a written test covering fire types and extinguisher selection plus a practical assessment (demonstrate proper extinguisher use on a simulated fire), supported by a competency checklist covering each critical step (check the pressure gauge, pull the pin, aim at the base of the fire).
- Collect post-assessment feedback surveys from trainees to identify content or delivery improvements for the next cycle.
- Where the business case must be made to leadership, escalate to Level 4/5 evaluation: compare incident/near-miss rates before and after, and calculate ROI using isolated, monetised benefits versus total programme cost.

Skill 5: Apply Education and Training Methods and Techniques

Scenario: A logistics company needs to train forklift operators on safe operating practices, and separately must train 200 field workers across three shifts, with varying English proficiency, on emergency evacuation procedures.

- For forklift operators: deliver classroom instruction (videos and slides covering basic operation and safety), then move to structured on-the-job training in the warehouse under supervision, following the four-step OJT method (Prepare → Present → Try-out → Follow-up).
- Use role-play during the classroom session so trainees must identify potential hazards in a simulated environment, and provide real-time feedback during practical sessions to correct unsafe behaviours immediately.
- For the 200-worker, multi-shift, multi-language evacuation training: select a blended approach — an e-learning knowledge module with subtitles/translation, plus hands-on evacuation drills run separately for each shift with bilingual trainers.

- Match method to objective type throughout: psychomotor objectives (harness donning, evacuation drills) require hands-on practice; purely cognitive/awareness content can be delivered efficiently via e-learning.

Skill 6: Apply Adult Learning Principles

Scenario: A safety trainer is redesigning a chronically low-engagement compliance training programme for an experienced, multicultural maintenance crew who have complained the sessions feel irrelevant and condescending.

- Apply Knowles' andragogy assumptions: replace generic lecture content with scenarios built from the crew's own recent near-misses (readiness to learn, task-centred orientation), and explain WHY each procedure matters before demonstrating HOW (need to know).
- Give experienced workers a role in the session — inviting them to share how they currently handle a hazard before presenting the 'official' procedure — to honour self-direction and the value of their prior experience.
- Design for multiple modes (VARK) rather than lecture alone: a short visual process map, a live discussion, a one-page written job aid, and a hands-on practice station.
- Apply Wlodkowski's motivational conditions for a culturally diverse group: use inclusive introductions (Establishing Inclusion), connect the training to career/safety goals (Developing Attitude), use culturally relevant examples (Enhancing Meaning), and provide guided practice with positive feedback (Engendering Competence).
- Rotate the session through Kolb's full cycle — a concrete task, guided reflection, a short conceptual debrief, and an opportunity to try the revised technique — rather than stopping after the hands-on activity.

DOMAIN 7 — QUICK-REFERENCE SUMMARY TABLE

Topic	Key Facts & Numbers to Memorize
TNA Three Levels	Organisational → Task (Job) → Person Analysis (McGehee & Thayer) — all three required for a complete TNA.
Is Training the Answer?	Skill/knowledge gap = train. Motivation/consequence, unclear procedure, or resource/environment issue = NOT a training problem.
ABCD Objective Model	Audience, Behaviour (observable/measurable verb), Condition, Degree. Avoid 'know', 'understand', 'appreciate' — not measurable.
Bloom's Taxonomy (Cognitive)	Remember → Understand → Apply → Analyse → Evaluate → Create (low to high).
Bloom's Other Domains	Psychomotor: Observe → Imitate → Practice → Adapt → Create. Affective: Receive → Respond → Value → Organise → Characterise.
ADDIE	Analysis → Design → Development → Implementation → Evaluation. Objectives are written in Design, AFTER Analysis (TNA).
Other ISD Models	SAM = agile/iterative rapid prototyping. Dick & Carey = linear, systematic 10-step. Kemp = flexible, non-linear.
Andragogy (Knowles)	Adults are: self-directed, experience-rich, problem-centred, task-oriented, intrinsically motivated, need to know 'why'.
VARK	Visual, Auditory, Read/Write, Kinaesthetic — design for multiple modes; scientific validity of style-matching is debated.
Kolb's Cycle	Concrete Experience → Reflective Observation → Abstract Conceptualisation → Active Experimentation.
70:20:10 Model	70% experiential (on-the-job), 20% social (coaching/mentoring), 10% formal training — holistic learning system design.
Retention Pyramid (approx.)	Lecture ~5–10% → Reading ~10% → Audiovisual ~20% → Demonstration ~30% → Discussion ~50% → Practice ~75% → Teaching others ~90%.
PDCA for Training	Plan (TNA, objectives, curriculum) → Do (deliver, document) → Check (Levels 2–4 data) → Act (revise, share results) — the Continuous Improvement model.
ANSI Z490.1	Voluntary consensus standard for the full training lifecycle; requires training in a language/vocabulary workers understand.
Kirkpatrick 4 Levels	1 Reaction (smile sheet) → 2 Learning (tests) → 3 Behaviour (transfer, 30/60/90-day observation) → 4 Results (injury/cost data).
Phillips ROI (Level 5)	$ROI\% = [(Benefits - Costs) / Costs] \times 100$. Requires monetising Level 4 results and isolating training's contribution.
Assessment Types	Criterion-referenced (vs. a standard, preferred in safety) vs. Norm-referenced (ranks learners). Formative (ongoing) vs. Summative (final).
Transfer of Training	Positive / Negative / Zero transfer. Supervisor support = single most important work-environment factor for transfer.
BBS ABC Model	Antecedent (initiates, doesn't sustain) → Behaviour → Consequence (Soon/Certain/Positive consequences are strongest).
OSHA Training Frequencies	HazCom/BBP/Respirator/Hearing — annual (varies); LOTO/Confined Space — when deficiency observed (no fixed interval); PSM — every 3 years.

Training Record Retention	BBP training records — 3 years. Medical/exposure records (BBP, lead) — duration of employment + 30 years.
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□ KEY REFERENCES

CORE REFERENCES FOR DOMAIN 7: • Roger Brauer, *Safety and Health for Engineers*, 3rd Ed.: Ch. 26 (Safety Education and Training) • D.S. Yates, *Occupational Safety and Health Management*, 2nd Ed.: Ch. 14 (Training and Education) • ANSI/ASSP Z490.1-2016: *Criteria for Accepted Practices in Safety, Health, and Environmental Training* • Kirkpatrick, J.D. & Kirkpatrick, W.K. (2016). *Kirkpatrick's Four Levels of Training Evaluation*. ATD Press • Knowles, M.S. (1980). *The Modern Practice of Adult Education: From Pedagogy to Andragogy* • Phillips, J.J. *Handbook of Training Evaluation and Measurement Methods* • Baldwin, T.T. & Ford, J.K. (1988). *Transfer of Training: A Review and Directions for Future Research* • McGehee, W. & Thayer, P.W. *Training in Business and Industry* • Geller, E.S. *The Psychology of Safety Handbook*; Krause, T.R. *The Behavior-Based Safety Process* • OSHA 29 CFR 1910 — numerous subpart standards with training requirements

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